

**Registration form**

**Mosquito Control CEU Training \$150.00**  
**48 HOUR RUSH ORDER PROCESSING FEE ADDITIONAL \$50.00**  
*Rush service does not include overnight delivery or FedEx fees.*

**Start and finish dates:** \_\_\_\_\_  
*You will have 90 days from this date in order to complete this course*

**Print Name** \_\_\_\_\_  
I have read and understood the disclaimer notice found on page 4. Signature is required.

**Signature** \_\_\_\_\_

**Address:** \_\_\_\_\_

**City** \_\_\_\_\_ **State** \_\_\_\_\_ **Zip** \_\_\_\_\_

**Phone:**  
**Home** (\_\_\_\_) \_\_\_\_\_ **Work** (\_\_\_\_) \_\_\_\_\_

**Fax** (\_\_\_\_) \_\_\_\_\_ **Email** \_\_\_\_\_

**License or Operator ID #** \_\_\_\_\_ **Exp. Date** \_\_\_\_\_

**Class/Grade** \_\_\_\_\_

**Please circle/check which certification you are applying the course CEU's.**

Commercial Applicator \_\_\_ Residential Applicator \_\_\_ Industrial Applicator \_\_\_

Pesticide Handler \_\_\_ Agricultural Applicator \_\_\_ Adviser \_\_\_ Other \_\_\_\_\_

**Your certificate will be mailed to you in about two weeks.**

**Technical Learning College TLC PO Box 3060, Chino Valley, AZ 86323**  
**Toll Free (866) 557-1746 Fax (928) 272-0747 email info@tlch2o.com**

## **DISCLAIMER NOTICE**

I understand that it is my responsibility to ensure that this CEU course is either approved or accepted in my State for CEU credit. I understand State laws and rules change on a frequent basis and I believe this course is currently accepted in my State for CEU or contact hour credit, if it is not, I will not hold Technical Learning College responsible. I fully understand that this type of study program deals with dangerous, changing conditions and various laws and that I will not hold Technical Learning College, Technical Learning Consultants, Inc. (TLC) liable in any fashion for any errors, omissions, advice, suggestions or neglect contained in this CEU education training course or for any violation or injury, death, neglect, damage or loss of your license or certification caused in any fashion by this CEU education training or course material suggestion or error or my lack of submitting paperwork. It is my responsibility to call or contact TLC if I need help or assistance and double-check to ensure my registration page and assignment has been received and graded. It is my responsibility to ensure all information is correct and to abide with all rules and regulations.

*You can obtain a printed version of the course manual from TLC for an additional \$69.95 plus shipping charges.*

## **AFFIDAVIT OF EXAM COMPLETION**

I affirm that I personally completed the entire text of the course. I also affirm that I completed the exam without assistance from any outside source. I understand that it is my responsibility to file or maintain my certificate of completion as required by the state or by the designation organization.

## **Grading Information**

In order to maintain the integrity of our courses we do not distribute test scores, percentages or questions missed. Our exams are based upon pass/fail criteria with the benchmark for successful completion set at 70%. Once you pass the exam, your record will reflect a successful completion and a certificate will be issued to you.

For security purposes, please fax or e-mail a copy of your driver's license and always call us to confirm we've received your assignment and to confirm your identity.

**Do not solely depend on TLC's Approval list for it may be outdated.**

**Some States and many employers require the final exam to be proctored.**

<http://www.abctlc.com/downloads/PDF/PROCTORFORM.pdf>

**A second certificate of completion for a second State Agency \$50 processing fee.**

**All downloads are electronically tracked and monitored for security purposes.**

**No refunds.**

**CUSTOMER SERVICE RESPONSE CARD**

**Mosquito Control Training Course**

NAME: \_\_\_\_\_

E-MAIL \_\_\_\_\_ PHONE \_\_\_\_\_

**PLEASE COMPLETE THIS FORM BY CIRCLING THE NUMBER OF THE APPROPRIATE ANSWER IN THE AREA BELOW.**

1. Please rate the difficulty of your course.  
Very Easy      0      1      2      3      4      5      Very Difficult

2. Please rate the difficulty of the testing process.  
Very Easy      0      1      2      3      4      5      Very Difficult

3. Please rate the subject matter on the exam to your actual field or work.  
Very Similar      0      1      2      3      4      5      Very Different

4. How did you hear about this Course? \_\_\_\_\_

5. What would you do to improve the Course?  
\_\_\_\_\_  
\_\_\_\_\_

How about the price of the course?

Poor \_\_\_\_\_ Fair \_\_\_\_\_ Average \_\_\_\_\_ Good \_\_\_\_\_ Great \_\_\_\_\_

How was your customer service?

Poor \_\_\_\_\_ Fair \_\_\_\_\_ Average \_\_\_\_\_ Good \_\_\_\_\_ Great \_\_\_\_\_

Any other concerns or comments.  
\_\_\_\_\_  
\_\_\_\_\_  
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## **Important Information about this Course (Disclaimer Notice)**

This CEU course has been prepared to educate pesticide applicators and operators in general safety awareness of dealing with the often-complex and various pesticide treatment sprays, devices, methods, and applications. This course (manual) will cover general laws, regulations, required procedures and accepted policies relating to the use of pesticides and herbicides. It should be noted, however, that the regulation of pesticides and hazardous materials is an ongoing process and subject to change over time. For this reason, a list of resources is provided to assist in obtaining the most up-to-date information on various subjects. This manual is not a guidance document for applicators or operators who are involved with pesticides. It is not designed to meet the requirements of the United States Environmental Protection Agency or your local State environmental protection agency or health department. This course manual will provide general pesticide safety awareness and should not be used as a basis for pesticide treatment method/device guidance. This document is not a detailed pesticide informational manual or a source or remedy for poison control.

Technical Learning College or Technical Learning Consultants, Inc. makes no warranty, guarantee or representation as to the absolute correctness or appropriateness of the information in this manual and assumes no responsibility in connection with the implementation of this information. It cannot be assumed that this manual contains all measures and concepts required for specific conditions or circumstances. This document should be used for educational purposes only and is not considered a legal document. Pesticides are poisonous. Always read and carefully follow all precautions and safety recommendations given on the container label. Store all chemicals in the original labeled containers in a locked cabinet or shed, away from food or feeds, and out of the reach of children, unauthorized persons, pets, and livestock.

Confine chemicals to the property or plants being treated. Avoid drift onto neighboring properties, especially gardens containing fruits and/or vegetables ready to be picked. Dispose of empty containers carefully. Follow label instructions for disposal. Never reuse containers. Make sure empty containers are not accessible to children or animals. Never dispose of containers where they may contaminate water supplies or natural waterways. Do not pour down sink or toilet. Consult your county agricultural commissioner for correct ways of disposing of excess pesticides. You should never burn pesticide containers.

Individuals who are responsible for pesticide storage, mixing and application should obtain and comply with the most recent federal, state, and local regulations relevant to these sites and are urged to consult with the EPA and other appropriate federal, state and local agencies.

**USE PESTICIDES WISELY: ALWAYS READ THE ENTIRE PESTICIDE LABEL CAREFULLY, FOLLOW ALL MIXING AND APPLICATION INSTRUCTIONS AND WEAR ALL RECOMMENDED PERSONAL PROTECTIVE GEAR AND CLOTHING. CONTACT YOUR STATE DEPARTMENT OF AGRICULTURE FOR ANY ADDITIONAL PESTICIDE USE REQUIREMENTS, RESTRICTIONS OR RECOMMENDATIONS.**

**NOTICE: MENTION OF PESTICIDE PRODUCTS IN THIS COURSE DOES NOT CONSTITUTE ENDORSEMENT OF ANY MATERIAL OR HERB OR HERBAL SUPPLEMENT. ALWAYS FOLLOW THE PRODUCT'S LABEL INSTRUCTIONS.**

### **NOTICE**

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### **Grading Information**

In order to maintain the integrity of our courses we do not distribute test scores, percentages or questions missed. Our exams are based upon pass/fail criteria with the benchmark for successful completion set at 70%. Once you pass the exam, your record will reflect a successful completion and a certificate will be issued to you.

**All downloads are electronically tracked and monitored for security purposes.**

# Mosquito Control Answer Key

You are responsible to ensure that this course is accepted for credit by your State. Did you check with your State agency to ensure this course is accepted for credit?

*Method of Course acceptance confirmation. Please fill this section*

Website \_\_\_ Telephone Call \_\_\_ Email \_\_\_ Spoke to \_\_\_\_\_

Did you receive the approval number, if applicable? \_\_\_\_\_

What is the course approval number, if applicable? \_\_\_\_\_

*You are responsible to ensure that TLC receives the Assignment and Registration Key. Please call us to ensure that we received it.*

**Multiple Choice. Pick only one answer per question.**

**Circle or Mark off, Underline or Bold the answer. Please circle the number of the assignment version 1 or 2 or 3 or 4 or 5**

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| 1. A B C D E  | 25. A B C D E | 49. A B C D E |
| 2. A B C D E  | 26. A B C D E | 50. A B C D E |
| 3. A B C D E  | 27. A B C D E | 51. A B C D E |
| 4. A B C D E  | 28. A B C D E | 52. A B C D E |
| 5. A B C D E  | 29. A B C D E | 53. A B C D E |
| 6. A B C D E  | 30. A B C D E | 54. A B C D E |
| 7. A B C D E  | 31. A B C D E | 55. A B C D E |
| 8. A B C D E  | 32. A B C D E | 56. A B C D E |
| 9. A B C D E  | 33. A B C D E | 57. A B C D E |
| 10. A B C D E | 34. A B C D E | 58. A B C D E |
| 11. A B C D E | 35. A B C D E | 59. A B C D E |
| 12. A B C D E | 36. A B C D E | 60. A B C D E |
| 13. A B C D E | 37. A B C D E | 61. A B C D E |
| 14. A B C D E | 38. A B C D E | 62. A B C D E |
| 15. A B C D E | 39. A B C D E | 63. A B C D E |
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| 17. A B C D E | 41. A B C D E | 65. A B C D E |
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| 217. A B C D E | 246. A B C D E | 275. A B C D E |
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| 219. A B C D E | 248. A B C D E | 277. A B C D E |
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| 241. A B C D E | 270. A B C D E | 299. A B C D E |
| 242. A B C D E | 271. A B C D E | 300. A B C D E |

You are finished with your assignment. Please fax this answer key and your registration page along with the customer survey to TLC.

**If you are a California DPR or Nevada student, we will require a photocopy of your driver's license.**

Fax Number (928) 272-0747 Back-Up Fax (928) 468-0675

Always call us after faxing the paperwork to confirm that we've received it. Allow two weeks for processing and for the proper DPR forms to be sent back to you. If you need this course graded and your certificate sooner, add a \$50.00 rush fee. This may not include postage charges. ***Thank you for your business.***

**Grading Information**

In order to maintain the integrity of our courses we do not distribute test scores, percentages or questions missed. Our exams are based upon pass/fail criteria with the benchmark for successful completion set at 70%. Once you pass the exam, your record will reflect a successful completion and a certificate will be issued to you.

**Rush Grading Service**

If you need this assignment graded and the results mailed to you within a 48-hour period, prepare to pay an additional rush service handling fee of \$50.00. This fee may not cover postage costs. If you need this service, simply write RUSH on the top of your Registration Form. We will place you in the front of the grading and processing line.



## INSTRUCTIONS

1. We will require all students to fax or e-mail a copy of their driver's license with the registration form.
2. You will need to pick one of the following five assignments to complete. This selection process is based upon your last name.

Assignment #1 for all pest applicators whose names start with the letter A- E pages 11-60.

Assignment #2 for all pest applicators whose last names start with F-K you will find your assignment on pages 61-109.

Assignment #3 for all pest applicators whose last name starts with the letter L-P, your assignment is found on pages 111-160.

Assignment #4 for all pest applicators whose last name starts with the letter Q-R, your assignment is found on pages 161-210.

Assignment #5 for all pest applicators whose last name starts with the letter S-Z, your assignment is found on pages 211-260.

If you are not a California Applicator and find a California Specific Question on your Assignment, please ignore the question and circle the question number. Skip the question if it is about the California law and you are not a California applicator.

### **2017 Changes to EPA's Farm Worker Protection Standard**

*In late 2015 the Environmental Protection Agency issued the long awaited revision to the Worker Protection Standard (WPS). This law it is now technically active and it will be enforced. Please keep in mind that the WPS covers both restricted use AND general use pesticides. This course is not for worker and/or handler training. Always follow the label and your State Pesticide Agency rules.*

*This course contains EPA's federal rule requirements. Please be aware that each state implements pesticide regulations that may be more stringent than EPA's regulations and these frequently are changed. Check with your state environmental/pesticide agency for more information.*



## Mosquito Control CEU Training Awareness Assignment #1 Last Names A to E

You will have 90 days from the start of this course to have successfully passed this assignment with a score of 70 %. You may e mail the answers to TLC, info@tlch2o.com or fax the answers to TLC, (928) 272-0747. This assignment is available to you in a Word Format on TLC's Website. You can find online assistance for this course on the in the Search function on Adobe Acrobat PDF to help find the answers. Once you have paid the course fee, you will be provided complete course support from Student Services (928) 468-0665.

Assignment #1 for all pest applicators whose names start with the letter A- E.

Assignment #2 for all pest applicators whose last names start with F-K.

Assignment #3 for all pest applicators whose last name starts with the letter L-P.

Assignment #4 for all pest applicators whose last name starts with the letter Q-R.

Assignment #5 for all pest applicators whose last name starts with the letter S-Z.

### **Multiple Choice Section, One answer per question and please use the answer key.**

#### Agricultural Pesticide Section

1. All agricultural employers whose workers perform \_\_\_\_\_ operations in fields, forests, nurseries, and greenhouses treated with pesticides, and handle pesticides in these locations are covered by the U.S. Environmental Protection Agency's worker protection standard.

- A. Handle pesticides
- B. Restricted entry intervals
- C. Hand labor
- D. Exempt farming
- E. None of the Above

2. Owners, operators, and their immediate \_\_\_\_\_ must comply with some of the provisions of this standard. This supplement to "A Summary of Federal Laws and Regulations Affecting Agricultural Employers," summarizes this regulation.

- A. Handle pesticides
- B. Restricted entry intervals
- C. Hand labor
- D. Exempt farming
- E. None of the Above

3. The WPS covers every agricultural employer, including livestock producers, who have employees that perform hand labor operations in fields, forests, nurseries, and greenhouses treated with \_\_\_\_\_.

- A. Pesticides
- B. Restricted entry intervals
- C. Hand labor
- D. None of the Above

4. Unlike other laws and regulations affecting agricultural labor, the WPS does not exempt any employment in commercial agriculture involving \_\_\_\_\_ in fields, but owners or operators and immediate family members are specifically exempt from some provisions.
- A. Handle pesticides
  - B. Restricted entry intervals
  - C. Hand labor
  - D. Exempt farming
  - E. None of the Above
5. The WPS expands coverage to include more employees and expands employers' requirements for training employees who \_\_\_\_\_, protecting employees from pesticide exposure, and providing emergency assistance to exposed employees.
- A. Handle pesticides
  - B. Restricted entry intervals
  - C. Hand labor
  - D. Exempt farming
  - E. None of the Above
6. Many laws affecting agricultural employment \_\_\_\_\_ enterprises that employ small numbers of hired farmworkers, the new standard has no exemptions based on the number of employees.
- A. Handle pesticides
  - B. Restricted entry intervals
  - C. Hand labor
  - D. Exempt farming
  - E. None of the Above
7. Employers covered by the WPS must:  
Reduce overall exposure to pesticides by prohibiting handlers from exposing workers during pesticide application, excluding workers from areas being treated and areas under a \_\_\_\_\_, and notifying workers about treated areas.
- A. Handle pesticides
  - B. Restricted entry intervals
  - C. Hand labor
  - D. Exempt farming
  - E. None of the Above
8. Some activities are allowed during \_\_\_\_\_ if workers are properly trained and protected.
- A. Handle pesticides
  - B. Restricted entry intervals
  - C. Hand labor
  - D. Exempt farming
  - E. None of the Above
9. \_\_\_\_\_ by requiring decontamination supplies be present and emergency assistance be available.
- A. Handle pesticides
  - B. Restricted entry intervals
  - C. Mitigate exposures
  - D. WPS
  - E. None of the Above

10. Inform workers about \_\_\_\_\_ hazards by requiring safety training (workers and handlers), safety posters, access to labeling information, and access to specific information (listing of treated areas on the establishment).
- A. Pesticide
  - B. Restricted entry intervals
  - C. Hand labor
  - D. WPS
  - E. None of the Above
11. \_\_\_\_\_ provisions are very complicated and are likely to affect a large number of employers and their workers.
- A. Handle pesticides
  - B. Restricted entry intervals
  - C. WPS
  - D. Exempt farming
  - E. None of the Above
12. States may also issue worker protection standards that are stricter than the \_\_\_\_\_.
- A. Handle pesticides
  - B. Restricted entry intervals
  - C. WPS
  - D. Exempt farming
  - E. None of the Above

#### Background

13. The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) of 1947, as amended, sets an overall risk/benefit standard for pesticide registration, requiring that all pesticides perform their intended function, when used \_\_\_\_\_, without imposing unreasonable risks of adverse effects on human health or the environment.

- A. Mitigating exposures
- B. FIFRA
- C. Basic requirements
- D. According to labeling directions
- E. None of the Above

14. During the congressional discussion of FIFRA amendments in 1972, the Senate Committee on Agriculture and Forestry (Committee) "found protection of man and the environment to be a broad term encompassing farmers, farmworkers, and others who come into \_\_\_\_\_".

- A. Mitigating exposures
- B. FIFRA
- C. Basic requirements
- D. Contact with pesticides
- E. None of the Above

#### Four Basic Requirements

15. These regulations contained four \_\_\_\_\_: Workers are not to be sprayed with pesticides.

- A. Mitigating exposures
- B. FIFRA
- C. Basic requirements
- D. Agricultural plants
- E. None of the Above

16. There are specific \_\_\_\_\_ for 12 pesticides, interim restrictive entry levels for certain pesticides, and a general re-entry interval for all other agricultural pesticides prohibiting re-entry into treated areas until sprays have dried, dusts have settled, and vapors have dispersed.

- A. Mitigating exposures
- B. FIFRA
- C. Basic requirements
- D. Restricted entry intervals (REI)
- E. None of the Above

17. Protective clothing is required for any worker entering a treated area before the \_\_\_\_\_ has expired.

- A. Mitigating exposures
- B. Specific re-entry period
- C. Basic requirements
- D. Agricultural plants
- E. None of the Above

18. "Appropriate and timely" warnings are \_\_\_\_\_. These warnings may be given orally in appropriate language, placed on the pesticide notice board, or posted in the field.

- A. Mitigating exposures
- B. FIFRA
- C. Basic requirements
- D. Required for re-entry
- E. None of the Above

#### Mitigating Exposures

19. \_\_\_\_\_ will be accomplished by requiring decontamination supplies and emergency assistance.

- A. Mitigating exposures
- B. FIFRA
- C. Basic requirements
- D. Agricultural plants
- E. None of the Above

20. Workers will be informed about pesticide hazards through \_\_\_\_\_ (workers and handlers), safety posters, access to labeling information, and access to specific information (listing of treated areas on the establishment).

- A. Mitigating exposures
- B. FIFRA
- C. Basic requirements
- D. Required safety training
- E. None of the Above

#### Worker Protection Standard for Agricultural Pesticides

Provisions of the WPS apply to:

21. Owners or managers of farms, forests, nurseries, or greenhouses where pesticides are used in the production of \_\_\_\_\_.

- A. Agricultural workers
- B. Agricultural plants
- C. Agricultural employer
- D. Worker or handler
- E. None of the Above

22. Those who hire or contract for services of agricultural workers to do tasks related to the production of \_\_\_\_\_ on a farm, forest, nursery, or greenhouse.

- A. Agricultural workers
- B. Agricultural plants
- C. Agricultural employer
- D. Worker or handler
- E. None of the Above

#### General Duties of WPS

The general duties of the WPS require an agricultural employer or a pesticide handler-employer to:

23. Assure that each \_\_\_\_\_ subject to the standard receives the required protections.

- A. Agricultural workers
- B. Agricultural plants
- C. Agricultural employer
- D. Worker or handler
- E. None of the Above

24. Assure that any \_\_\_\_\_ to the standard is used in a manner consistent with the labeling of the pesticide, including the requirements in the standard.

- A. Agricultural workers
- B. Agricultural plants
- C. Agricultural employer
- D. Worker or handler
- E. None of the Above

25. Provide sufficient information and directions to each person who supervises any \_\_\_\_\_ to assure that each worker or handler receives the required protection.

- A. Agricultural workers
- B. Agricultural plants
- C. Agricultural employer
- D. Worker or handler
- E. None of the Above

26. The \_\_\_\_\_ must specify which persons are responsible for actions required to comply with the standard.

- A. Agricultural workers
- B. Agricultural plants
- C. Agricultural employer
- D. Worker or handler
- E. None of the Above

27. Require each person who supervises any \_\_\_\_\_ to assure compliance by the worker or handler with the provisions of this standard and to assure that the worker or handler receives the required protection (40 CFR).

- A. Agricultural workers
- B. Agricultural plants
- C. Agricultural employer
- D. Worker or handler
- E. None of the Above

28. The general duties also prohibit agricultural and handler employers from taking any retaliatory actions against workers attempting to comply with this standard, or from taking any action that prevents or discourages any \_\_\_\_\_ from complying or attempting to comply with the WPS.

- A. Agricultural workers
- B. Agricultural plants
- C. Agricultural employer
- D. Worker or handler
- E. None of the Above

#### Labeling

29. Requires everyone \_\_\_\_\_ to obey instructions printed on the pesticide container's label.

- A. Notification to workers
- B. Restricted-entry intervals
- C. Applying pesticides
- D. Personal protective equipment
- E. None of the Above

#### Summary of WPS Requirements

30. Protection during applications -- Applicators are prohibited from applying a pesticide in a way that will expose workers or other persons. \_\_\_\_\_ are excluded from areas while pesticides are being applied.

- A. Workers
- B. Restricted-entry intervals
- C. Emergency assistance
- D. Personal protective equipment
- E. None of the Above

31. \_\_\_\_\_ must be specified on all agricultural plant pesticide product labels.

- A. Notification to workers
- B. Restricted-entry intervals
- C. Emergency assistance
- D. Personal protective equipment
- E. None of the Above

32. Workers are excluded from entering a pesticide-treated area during the \_\_\_\_\_, with only narrow exceptions.

- A. Notification to workers
- B. Restricted-entry intervals
- C. Emergency assistance
- D. Personal protective equipment
- E. None of the Above

33. \_\_\_\_\_ -- Personal protective equipment must be provided and maintained for handlers and early-entry workers.

- A. Notification to workers
- B. Restricted-entry intervals
- C. Emergency assistance
- D. Personal protective equipment
- E. None of the Above



34. \_\_\_\_\_ -- Workers must be notified about treated areas so they may avoid inadvertent exposures.
- A. Notification to workers
  - B. Restricted-entry intervals
  - C. Emergency assistance
  - D. Personal protective equipment
  - E. None of the Above
35. \_\_\_\_\_ -- Handlers and workers must have an ample supply of water, soap, and towels for routine washing and emergency decontamination.
- A. Notification to workers
  - B. Decontamination supplies
  - C. Emergency assistance
  - D. Personal protective equipment
  - E. None of the Above
36. \_\_\_\_\_ Transportation must be made available to a medical care facility if a worker or handler may have been poisoned or injured. Information must be provided about the pesticide to which the person may have been exposed.
- A. Notification to workers
  - B. Restricted-entry intervals
  - C. Emergency assistance
  - D. Personal protective equipment
  - E. None of the Above
37. \_\_\_\_\_ -- Training is required for all workers and handlers, and a pesticide safety poster must be displayed.
- A. Notification to workers
  - B. Pesticide safety training and safety posters
  - C. Emergency assistance
  - D. Central posting
  - E. None of the Above
38. Access to labeling and site-specific information -- Handlers and workers must be informed of pesticide label requirements. \_\_\_\_\_ of recent pesticide applications is required.
- A. Notification to workers
  - B. Pesticide safety training and safety posters
  - C. Emergency assistance
  - D. Central posting
  - E. None of the Above
39. \_\_\_\_\_ used on sod farms are covered by WPS.
- A. Agricultural Use Requirements
  - B. Pesticides
  - C. Restricted-entry interval (REI)
  - D. Agricultural establishment
  - E. None of the Above

40. Some pesticide uses are not covered by WPS, even when the \_\_\_\_\_ section is on the labeling.

- A. Agricultural Use Requirements
- B. Pesticide applications
- C. Restricted-entry interval (REI)
- D. Agricultural establishment
- E. None of the Above

41. If the pesticide labeling bears an \_\_\_\_\_ section, but the product also can be applied to rights-of-way, the rights-of-way use is not covered by WPS.

- A. Agricultural Use Requirements
- B. Pesticide applications
- C. Restricted-entry interval (REI)
- D. Agricultural establishment
- E. None of the Above

WPS Requires Restricted Entry to Treated Areas

42. \_\_\_\_\_ is the time immediately after a pesticide application when entry into the treated area is prohibited or very limited.

- A. Agricultural Use Requirements
- B. Pesticide applications
- C. Restricted-entry interval (REI)
- D. Agricultural establishment
- E. None of the Above

43. \_\_\_\_\_ are established for all pesticides used in the production of agricultural plants depending on toxicity.

- A. Agricultural Use Requirements
- B. Pesticide applications
- C. Restricted-entry interval (REI)
- D. Agricultural establishment
- E. None of the Above

44. The REI is listed on the pesticide labeling under the heading “\_\_\_\_\_” in the “Directions for Use” section of the pesticide labeling or next to the crop or application method to which it applies.

- A. Agricultural Use Requirements
- B. Pesticide applications
- C. Restricted-entry interval (REI)
- D. Agricultural establishment
- E. None of the Above

45. \_\_\_\_\_ must be specified on all agricultural plant pesticide product labels.

- A. Agricultural Use Requirements
- B. Pesticide applications
- C. Restricted-entry interval (REI)
- D. Agricultural establishment
- E. None of the Above

46. Workers are excluded from entering a pesticide treated area during \_\_\_\_\_, with few narrow exceptions.
- A. Agricultural Use Requirements
  - B. Pesticide applications
  - C. Restricted-entry interval (REI)
  - D. Agricultural establishment
  - E. None of the Above
47. The duration of \_\_\_\_\_ ranges from 4 hours to several days. Some pesticides have one REI, such as 12 hours, for all crops and uses.
- A. Agricultural Use Requirements
  - B. Pesticide applications
  - C. Restricted-entry interval (REI)
  - D. None of the Above
48. Other products have different \_\_\_\_\_, depending on the crop or method of application. When two or more pesticides are applied at the same time and have different REIs, the longer interval must be followed.
- A. Agricultural Use Requirements
  - B. Pesticide applications
  - C. Restricted-entry interval (REI)
  - D. Agricultural establishment
  - E. None of the Above
49. There is a \_\_\_\_\_ for 4 hours for all products with WPS labeling; this means no early entry.
- A. Agricultural Use Requirements
  - B. Pesticide applications
  - C. Restricted-entry interval (REI)
  - D. No-entry period
  - E. None of the Above
50. \_\_\_\_\_ mosquitoes are ready to bite one to two days after adult emergence.
- A. Culex
  - B. Larvae
  - C. Female
  - D. Male
  - E. None of the Above
51. \_\_\_\_\_ mosquitoes do not bite but feed on flower nectar or plant juices. Some mosquitoes have only one generation per year, whereas others may have four or more.
- A. Culex
  - B. Larvae
  - C. Female
  - D. Male
  - E. None of the Above

52. \_\_\_\_\_ may fly 5 to 10 miles, but usually rest in grass, shrubbery, or other foliage close to the water breeding area.

- A. Culex
- B. Larvae
- C. Adults
- D. Male
- E. None of the Above

#### Mosquito Habitats

53. Few mosquito species in the U.S. breed in \_\_\_\_\_, such as streams.

- A. Running waters
- B. Stream volume
- C. Stream breeders
- D. Along banks
- E. None of the Above

54. Larvae can be flushed out when \_\_\_\_\_ increases, and to remain in the stream requires a large amount of energy.

- A. Running waters
- B. Stream volume
- C. Stream breeders
- D. Along banks
- E. None of the Above

55. The tropical genus *Chagasia* and some *Anopheles* species are \_\_\_\_\_. In addition, *Anopheles quadrimaculatus*, *Culex territans*, and *Uranotaenia sapphirina* have all been found in streams, although they prefer other habitats.

- A. Running waters
- B. Stream volume
- C. Stream breeders
- D. Along banks
- E. None of the Above

56. Stream breeders will find vegetation \_\_\_\_\_ with which to anchor themselves or attempt to remain away from the main flow of the stream by seeking isolated eddies.

- A. Running waters
- B. Stream volume
- C. Stream breeders
- D. Along banks
- E. None of the Above

57. Transient water sources, such as \_\_\_\_\_, snowpools, and ditches, are used as breeding grounds for mosquito species whose eggs can withstand desiccation, such as *Aedes* and *Psorophora*.

- A. Running waters
- B. Stream volume
- C. Stream breeders
- D. Flooded areas
- E. None of the Above

58. Their life cycles require alternating periods of wet and dry. Other species, like an opportunistic Culex, might be able to pull off a single generation during an extended \_\_\_\_\_.

- A. Running waters
- B. Stream volume
- C. Flooded period
- D. Along banks
- E. None of the Above

59. \_\_\_\_\_ generally shows water quality changes which result in various mosquito species using the same pool over a period of time.

- A. Running waters
- B. Transient water
- C. Stream breeders
- D. Along banks
- E. None of the Above

60. Genera associated with \_\_\_\_\_ are Anopheles, Culex, Culiseta, Coquillettia, and Uranotaenia.

- A. Running waters
- B. Stream volume
- C. Stream breeders
- D. Permanent water
- E. None of the Above

61. Eggs of these species are not desiccant-resistant and must be laid directly \_\_\_\_\_.

- A. Running waters
- B. On the water
- C. Stream breeders
- D. None of the Above

62. As with transient waters, there is a seasonal change in the vegetation, \_\_\_\_\_, and mosquito species present.

- A. Water quality
- B. Stream volume
- C. Breeders
- D. Along banks
- E. None of the Above

63. Culiseta are found in \_\_\_\_\_ formed by pockets of water surrounding tree roots.

- A. Running waters
- B. Stream volume
- C. Crypts
- D. Along banks
- E. None of the Above

Containers

64. \_\_\_\_\_ sites generally have tannin-enriched water, which is characteristically clear, with rotting wood at the bottom.

- A. Treehole
- B. Insulation
- C. Containers
- D. Artificial
- E. None of the Above

65. Many \_\_\_\_\_ species now also use artificial sites, such as tires, since they provide insulation against the weather and are more numerous.

- A. Treehole
- B. Insulation
- C. Containers
- D. Artificial
- E. None of the Above

66. Artificial \_\_\_\_\_ are a convenient mode of transporting a species of mosquito outside of its natural range.

- A. Treehole
- B. Insulation
- C. Containers
- D. Artificial
- E. None of the Above

#### Mosquito Control Section

67. The mission of the Environmental Protection Agency (EPA) is to \_\_\_\_\_ and the environment.

- A. Protect human health
- B. Minimize the risk of human exposure
- C. Conduct surveillance for diseases
- D. Evaluating larval populations
- E. None of the Above

68. The EPA reviews and approves pesticides and their labeling to ensure that the pesticides used to protect public health are applied by methods which \_\_\_\_\_ and adverse health and environmental effects.

- A. Protect human health
- B. Minimize the risk of human exposure
- C. Conduct surveillance for diseases
- D. None of the Above

#### How Are Mosquitoes Controlled with Pesticides and Other Methods?

69. The first step in mosquito control is surveillance. Mosquito specialists \_\_\_\_\_ harbored by domestic and nonnative birds, including sentinel chickens (used as virus transmission indicators), and mosquitoes.

- A. Protect human health
- B. Minimize the risk of human exposure
- C. Conduct surveillance for diseases
- D. None of the Above

70. Surveillance for larval habitats is conducted by using maps and aerial photographs, and by \_\_\_\_\_.

- A. Protect human health
- B. Minimize the risk of human exposure
- C. Conduct surveillance for diseases
- D. Evaluating larval populations
- E. None of the Above

71. Other techniques include various light traps, biting counts, and \_\_\_\_\_.
- A. Protect human health
  - B. Minimize the risk of human exposure
  - C. Analysis of reports from the public
  - D. Evaluating larval populations
  - E. None of the Above

72. Mosquito control programs also put high priority on trying to \_\_\_\_\_, so that additional controls may not be necessary.
- A. Protect human health
  - B. Minimize the risk of human exposure
  - C. Conduct surveillance for diseases
  - D. Prevent a large population of adult mosquitoes from developing
  - E. None of the Above

73. Since mosquitoes must have water to breed, methods of prevention may include controlling water levels in lakes, marshes, ditches, or other mosquito breeding sites, \_\_\_\_\_ if possible, and stocking bodies of water with fish species that feed on larvae.
- A. Eliminating small breeding sites
  - B. Minimize the risk of human exposure
  - C. Conduct surveillance for diseases
  - D. Evaluating larval populations
  - E. None of the Above

74. Both chemical and biological measures may be employed to \_\_\_\_\_ during larval stages.
- A. Protect human health
  - B. Minimize the risk of human exposure
  - C. Conduct surveillance for diseases
  - D. Kill immature mosquitoes
  - E. None of the Above

#### Larvicides

75. \_\_\_\_\_ target larvae in the breeding habitat before they can mature into adult mosquitoes and disperse.
- A. Larvicides
  - B. Mineral oils
  - C. Liquid
  - D. None of the Above

76. \_\_\_\_\_ include the bacterial insecticides *Bacillus thuringiensis israelensis* and *Bacillus sphaericus*, the insect growth inhibitor methoprene, and the organophosphate insecticide temephos.
- A. Larvicides
  - B. Mineral oils
  - C. Liquid
  - D. Mosquito controllers
  - E. None of the Above

77. \_\_\_\_\_ and other materials form a thin film on the surface of the water, which cause larvae and pupae to drown.

- A. Larvicides
- B. Mineral oils
- C. Liquid
- D. Mosquito controllers
- E. None of the Above

78. \_\_\_\_\_ larvicide products are applied directly to water using backpack sprayers and truck or aircraft-mounted sprayers. Tablet, pellet, granular, and briquette formulations of larvicides are also applied by mosquito controllers to breeding areas.

- A. Larvicides
- B. Mineral oils
- C. Liquid
- D. Mosquito controllers
- E. None of the Above

Methoprene (Altosid XR)

79. Methoprene (Altosid XR) is another safe material for control of mosquito larvae. It is an insect hormone that \_\_\_\_\_ of larvae (disrupts molting) and prevents mosquitoes from developing into adults.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Labeled for use in known fish habitats
- E. None of the Above

Altosid XR Briquettes

80. Altosid XR Briquettes \_\_\_\_\_. Treat swamps, ponds, and marsh areas in early spring before thawing.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Labeled for use in known fish habitats
- E. None of the Above

81. These extended-release briquettes will provide up to \_\_\_\_\_ once they hit the water.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Labeled for use in known fish habitats
- E. None of the Above

82. They can be applied by hand and the product is \_\_\_\_\_.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Labeled for use in known fish habitats
- E. None of the Above



Microbial insecticides

83. The product known as Bti (*Bacillus thuringiensis israeliensis*) can be as effective as chemical insecticides. When the bacteria Bti encysts, \_\_\_\_\_.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. It produces a protein crystal toxic to mosquito and midge larvae
- D. Labeled for use in known fish habitats
- E. None of the Above

84. Once the bacterium has been ingested, \_\_\_\_\_. It has no effect on a vast array of other aquatic organisms except midges in the same habitat. Bti strains are sold under the names Bactimos, Teknar and Vectobac.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. The toxin disrupts the lining of the larvae's intestine
- E. None of the Above

Mosquito Dunks or Briquettes

85. Product Description: \_\_\_\_\_ objects that release bacteria into water where mosquitoes are breeding. When the larvae feed on the bacteria, they die.

- A. Small donut shaped and sized
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Labeled for use in known fish habitats
- E. None of the Above

Juvenile Hormone

86. Methoprene (sold under the name Altosid) is an insect growth regulator widely used by abatement districts to \_\_\_\_\_.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. Control mosquito larvae
- D. Labeled for use in known fish habitats
- E. None of the Above

87. Methoprene \_\_\_\_\_, and when present in the larval habitat, it keeps immature insects from maturing into adults.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. Mimics a natural juvenile hormone
- D. Labeled for use in known fish habitats
- E. None of the Above

88. Unable to metamorphose, the mosquitoes \_\_\_\_\_.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. Die in the pupal stage
- D. None of the Above

89. Vector control technicians sometimes use methoprene to reach larval sources that would \_\_\_\_\_.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. Otherwise be difficult or dangerous to treat
- D. Labeled for use in known fish habitats
- E. None of the Above

90. Pellets \_\_\_\_\_ into underground septic tanks known to be breeding house mosquitoes.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Can be flushed down toilets
- E. None of the Above

91. The methoprene kills the mosquitoes without upsetting the septic system's \_\_\_\_\_.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Bacterial digestive processes
- E. None of the Above

#### Larvicidal Oils

92. Oils have been used for mosquito control for more than a century. The Marin / Sonoma District in California uses \_\_\_\_\_, a light-viscosity oil that spreads quickly and evenly over the water surface, preventing larvae and pupae from obtaining oxygen through the surface film.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

93. \_\_\_\_\_ have always been used as a product of last resort for the control of mosquito pupae, since this stage does not feed but does require oxygen. The only other option would be draining the source.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

#### Chemical Larvicides

94. Chlorinated hydrocarbons like DDT and \_\_\_\_\_ are very much a thing of the past, as are the use of organophosphate and carbamate insecticides.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

95. \_\_\_\_\_ were removed from the US market in 1964, and in 1987.
- A. Golden Bear 1111
  - B. Oils
  - C. Chlorinated hydrocarbons
  - D. Chlordane
  - E. None of the Above

Adulticides

96. \_\_\_\_\_ control may be undertaken to combat an outbreak of mosquito-borne disease or a very heavy nuisance infestation of mosquitoes in a community.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

97. Pesticides registered for this use are \_\_\_\_\_ and are applied either by aircraft or on the ground, employing truck-mounted sprayers.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Adulticides
- E. None of the Above

98. State and local agencies commonly use the \_\_\_\_\_ Malathion and Naled and the synthetic pyrethroid insecticides Permethrin, Resmethrin, and Sumithrin for adult mosquito control.

- A. Golden Bear 1111
- B. Oils
- C. Organophosphate insecticides
- D. Chlordane
- E. None of the Above

99. Mosquito adulticides are applied as \_\_\_\_\_ sprays. Ultra-low volume (ULV) sprayers dispense very fine aerosol droplets that stay aloft and kill flying mosquitoes on contact.

- A. Golden Bear 1111
- B. Oils
- C. Ultra-low volume (ULV)
- D. Chlordane
- E. None of the Above

100. \_\_\_\_\_ applications involve small quantities of pesticide active ingredient in relation to the size of the area treated, typically less than 3 ounces per acre, which minimizes exposure and risks to people and the environment.

- A. Golden Bear 1111
- B. ULV
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

101. Chemical Control of Adult Mosquitoes  
Because of environmental concerns and drift, \_\_\_\_\_ are not the most popular method.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chemical pesticides
- E. None of the Above

102. Chemical pesticides, the technique used for adult mosquito control is known as \_\_\_\_\_ spray.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

103. A small quantity of the pesticide is \_\_\_\_\_ and broadcast in a fog that drifts into sites where the adult mosquitoes hide. At best, control is achieved up to 300 feet away, but it does help reduce the numbers of biting mosquitoes to tolerable levels.

- A. Aerosol bombs
- B. Hand-carried dispersal units
- C. ULV spraying
- D. Atomized into micron-size particles
- E. None of the Above

104. In recent years the use of vehicle-mounted units has decreased in favor of small, \_\_\_\_\_. This allows a more precise application of the pesticide.

- A. Aerosol bombs
- B. Hand-carried dispersal units
- C. ULV spraying
- D. Aerosol foggers
- E. None of the Above

105. The pesticide used for \_\_\_\_\_ is pyrethrum (sold as Pyroicide), a naturally occurring substance harvested from two species of Old World chrysanthemums, or pyrethrum flowers.

- A. Aerosol bombs
- B. Hand-carried dispersal units
- C. ULV spraying
- D. Aerosol foggers
- E. None of the Above

106. This material is the \_\_\_\_\_ for mosquito control, and it degrades into non-toxic by-products within 4 to 6 hours after spraying.

- A. Aerosol bombs
- B. Hand-carried dispersal units
- C. Least toxic available
- D. Aerosol foggers
- E. None of the Above

Indoor Control

107. Space sprays or aerosol "bombs," containing synergized pyrethrins 0.1%, are effective against adult mosquitoes. \_\_\_\_\_ may be needed during problem periods.

- A. Frequent treatments
- B. Temporary treatment
- C. One to two days of treatment
- D. Residual treatment
- E. None of the Above

Outdoor Control Adulticides

108. Space sprays or aerosol foggers containing pyrethrins result in rapid knockdown of adult mosquitoes. However, it is a \_\_\_\_\_ with little residual effect.

- A. Frequent treatments
- B. Temporary treatment
- C. One to two days of treatment
- D. Residual treatment
- E. None of the Above

109. \_\_\_\_\_ applied to tall grasses, weeds, trees, shrubs, and outbuildings, one to two days before use of the area, are effective.

- A. Frequent treatments
- B. Temporary treatment
- C. One to two days of treatment
- D. Residual sprays
- E. None of the Above

110. Some insecticides registered for residual mosquito control include: \_\_\_\_\_, chlorpyrifos (Dursban), and Malathion.

- A. Carbaryl (Sevin)
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

111. Malathion and \_\_\_\_\_ are extremely toxic to honey bees. Do not spray plants when in bloom. Mow weedy areas before treatment.

- A. Chlorinated hydrocarbons
- B. Oils
- C. Carbaryl (Sevin)
- D. Chlordane
- E. None of the Above

112. Bee losses are minimized by spraying late in the afternoon when bees are gone or when temperatures are below 45°F. \_\_\_\_\_ and methoxychlor are highly toxic to fish.

- A. Chlorinated hydrocarbons
- B. Oils
- C. Carbaryl (Sevin)
- D. Malathion
- E. None of the Above

Mosquito fish (*Gambusia affinis*)

113. Mosquito fish can eat \_\_\_\_\_ per day. They play an important role in mosquito control in ponds, canals, irrigated fields, and some other freshwater sources.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. Encephalitis
- D. Deet
- E. None of the Above

114. The fish live two to three years; they are live-bearing and produce \_\_\_\_\_ each year.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. Encephalitis
- D. Deet
- E. None of the Above

Repellents

115. Repellents applied to the skin and clothing will prevent mosquito bites for \_\_\_\_\_ depending on the person, type, number of mosquitoes, and the type and percent of active ingredient in the repellent.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. One to five hours
- D. Deet
- E. None of the Above

116. N, N-Diethyl-m-toluamide (Deet) is very effective and widely used as a \_\_\_\_\_, but it should not be used indiscriminately, as severe allergies can develop.

- A. Frequent treatments
- B. Temporary treatment
- C. One to two days of treatment
- D. Residual treatment
- E. None of the Above

Prevention

117. Since most of the mosquitoes that transmit \_\_\_\_\_ will not travel very far, the risk of contracting \_\_\_\_\_ can be minimized by controlling the mosquito breeding sites that are in close proximity to your home.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. Encephalitis
- D. Deet
- E. None of the Above

118. Water management, to prevent mosquito breeding, is essential for control. Eggs do not hatch unless they are \_\_\_\_\_.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. In water
- D. Deet
- E. None of the Above

Pesticides and Mosquito Control Summary

119. Mosquito-borne diseases affect millions of people worldwide each year. In the United States, some species of mosquitoes can transmit diseases such as \_\_\_\_\_, dengue fever, and malaria to humans, and a variety of diseases to wildlife and domestic animals.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Encephalitis
- D. Human exposure
- E. None of the Above

120. To combat mosquitoes and the public health hazards they present, many states and localities have established \_\_\_\_\_.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Mosquito control programs
- D. Human exposure
- E. None of the Above

121. These programs, which are based on \_\_\_\_\_, can include non-chemical forms of prevention and control, as well as ground and aerial application of chemical and biological pesticides.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Encephalitis
- D. Human exposure
- E. None of the Above

122. The mission of the Environmental Protection Agency (EPA) is to protect \_\_\_\_\_ and the environment.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Human health
- D. Human exposure
- E. None of the Above

123. The EPA reviews and approves pesticides and their labeling to ensure that the pesticides used to protect \_\_\_\_\_ are applied by methods that minimize the risk of human exposure and adverse health and environmental effects.

- A. Public health
- B. Infectious diseases
- C. Encephalitis
- D. Human exposure
- E. None of the Above

124. In relation to mosquito control, the Agency also serves as a source of information about pesticide and \_\_\_\_\_ to address the concerns of the general public, news media, and the state and local agencies dealing with outbreaks of infectious diseases or heavy infestations of mosquitoes.

- A. Non-pesticide controls
- B. Infectious diseases
- C. Encephalitis
- D. Human exposure
- E. None of the Above

Malathion for Mosquito Control

125. Officials responsible for mosquito control programs make decisions to use pesticides based on an evaluation of the \_\_\_\_\_ from diseases transmitted by mosquitoes or on an evaluation of the nuisance level that communities can tolerate from a mosquito infestation.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Risks to the general public
- D. Human exposure
- E. None of the Above

126. Based on \_\_\_\_\_, mosquito control officials select specific pesticides and other control measures that best suit local conditions in order to achieve effective control of mosquitoes with the least impact on human health and the environment.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Surveillance and monitoring
- D. Human exposure
- E. None of the Above

127. It is especially important to conduct effective \_\_\_\_\_ by eliminating breeding habitats or applying pesticides to control the early life stages of the mosquito.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Mosquito prevention programs
- D. Human exposure
- E. None of the Above

128. \_\_\_\_\_, such as elimination of any standing water that could serve as a breeding site, help reduce the adult mosquito population and the need to apply other pesticides for adult mosquito control.

- A. Prevention programs
- B. Infectious diseases
- C. Encephalitis
- D. Human exposure
- E. None of the Above

129. Since no pesticide can be considered 100 percent safe, pesticide applicators and the general public should always exercise care and follow specified \_\_\_\_\_ during use to reduce risks.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Safety precautions
- D. Human exposure
- E. None of the Above

What is Malathion?

130. Malathion is an organophosphate (OP) \_\_\_\_\_ that has been registered for use in the United States since 1956.

- A. Insecticide
- B. To kill mosquitoes
- C. Kill adult mosquitoes
- D. Larva
- E. None of the Above



131. When applied in accordance with the rate of application and safety precautions specified on the label, Malathion can be used \_\_\_\_\_ without posing unreasonable risks to human health or the environment.

- A. Insecticide
- B. To kill mosquitoes
- C. Kill adult mosquitoes
- D. Larva
- E. None of the Above

How is Malathion Used in Mosquito Control?

132. The mosquito goes through four distinct stages during its life cycle: egg, larva, pupa, and adult. Malathion is an adulticide, used to \_\_\_\_\_.

- A. Insecticide
- B. To kill mosquitoes
- C. Kill adult mosquitoes
- D. Larva
- E. None of the Above

133. In mosquito control programs conducted by state or local authorities, Malathion is applied by truck-mounted or \_\_\_\_\_.

- A. Insecticide
- B. Aircraft-mounted sprayers
- C. Kill adult mosquitoes
- D. Ultra-low volume (ULV) spray
- E. None of the Above

134. Malathion is applied as an \_\_\_\_\_. Ultra-low volume (ULV) sprayers dispense very fine aerosol droplets that stay aloft and kill mosquitoes on contact.

- A. Insecticide
- B. Aircraft-mounted sprayers
- C. Kill adult mosquitoes
- D. Ultra-low volume (ULV) spray
- E. None of the Above

135. For mosquito control, Malathion is applied at a maximum rate of 0.23 pounds (or about 2.5 fluid ounces) of active ingredient per acre, which \_\_\_\_\_ exposure and risks to people and the environment.

- A. Minimizes
- B. Kill mosquitoes
- C. Maximizes
- D. Kill larva
- E. None of the Above

136. Malathion can be used for \_\_\_\_\_ programs without posing unreasonable risks to the general population when applied according to the label.

- A. Public health mosquito control
- B. Adults and children
- C. Small amount of active ingredient
- D. Skin and inhalation exposure
- E. None of the Above

137. The EPA has estimated the exposure and risks to both \_\_\_\_\_ posed by ULV aerial and ground applications of Malathion.

- A. Public health mosquito control
- B. Adults and children
- C. Small amount of active ingredient
- D. Skin and inhalation exposure
- E. None of the Above

138. Because of the very \_\_\_\_\_ released per acre of ground, the estimates found that for all scenarios considered, exposures were hundreds or even thousands of times below an amount that might pose a health concern.

- A. Public health mosquito control
- B. Adults and children
- C. Small amount of active ingredient
- D. Skin and inhalation exposure
- E. None of the Above

139. These estimates assumed several spraying events over a period of weeks, and also assumed that a toddler would ingest some soil and grass in addition to \_\_\_\_\_.

- A. High-dose poisoning
- B. Nausea, dizziness, or confusion
- C. Small amount of active ingredient
- D. Skin and inhalation exposure
- E. None of the Above

140. At high doses, Malathion, like other organophosphates, can overstimulate the nervous system, causing \_\_\_\_\_.

- A. High-dose poisoning
- B. Nausea, dizziness, or confusion
- C. Small amount of active ingredient
- D. Skin and inhalation exposure
- E. None of the Above

141. Severe \_\_\_\_\_ with any organophosphate can cause convulsions, respiratory paralysis, and death.

- A. Public health mosquito control
- B. Adults and children
- C. High-dose poisoning
- D. Skin and inhalation exposure
- E. None of the Above

142. Malathion used in mosquito control programs does not pose unreasonable \_\_\_\_\_ or the environment.

- A. Risks to wildlife
- B. Low toxicity
- C. Toxic to insects
- D. To reduce risks
- E. None of the Above

143. Malathion degrades rapidly in the environment, especially in moist soil, and it displays \_\_\_\_\_ to birds and mammals.

- A. Risks to wildlife
- B. Low toxicity
- C. Toxic to insects
- D. To reduce risks
- E. None of the Above

144. Malathion is highly \_\_\_\_\_, including beneficial insects such as honeybees.

- A. Risks to wildlife
- B. Low toxicity
- C. Toxic to insects
- D. To reduce risks
- E. None of the Above

145. For that reason, the EPA has established specific precautions on the label to reduce such \_\_\_\_\_.

- A. Risks
- B. Low toxicity
- C. Toxic to insects
- D. To reduce risks
- E. None of the Above

#### Larvicides For Mosquito Control

146. Prevention programs, such as the elimination of any standing water that could serve as a breeding site, help reduce the adult \_\_\_\_\_ and the need to apply other pesticides for adult mosquito control.

- A. Risks to wildlife
- B. Mosquito population
- C. Toxic to insects
- D. To reduce risks
- E. None of the Above

147. Since no pesticide can be considered 100 percent safe, pesticide applicators and the general public should always exercise care and follow specified safety precautions during use \_\_\_\_\_.

- A. Risks to wildlife
- B. Low toxicity
- C. Toxic to insects
- D. To reduce risks
- E. None of the Above

#### Larvicides

148. Larvicides kill mosquito larvae. Larvicides include \_\_\_\_\_, such as the microbial larvicides *Bacillus sphaericus* and *Bacillus thuringiensis israelensis*.

- A. Biological insecticides
- B. Adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Pesticide usage
- E. None of the Above

149. Larvicides include other pesticides, such as temephos, methoprene, oils, and monomolecular films. Larvicide treatment of breeding habitats help reduce the \_\_\_\_\_ in nearby areas.

- A. Biological insecticides
- B. Adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Pesticide usage
- E. None of the Above

How are Larvicides Used in Mosquito Control?

150. State and local agencies in charge of mosquito control typically employ a variety of techniques in an \_\_\_\_\_ program.

- A. Biological insecticides
- B. Adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Pesticide usage
- E. None of the Above

151. An IPM approach includes surveillance, \_\_\_\_\_, larviciding, and adulticiding to control mosquito populations.

- A. Biological insecticides
- B. Adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Source reduction
- E. None of the Above

152. Since mosquitoes must have water to breed, source reduction can be as simple as turning over trapped water in a container to undertaking large-scale \_\_\_\_\_ of marsh water levels.

- A. Engineering and management
- B. Adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Pesticide usage
- E. None of the Above

153. Larviciding involves applying pesticides to breeding habitats to kill mosquito larvae. Larviciding can reduce overall \_\_\_\_\_ in a control program.

- A. Biological insecticides
- B. Adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Pesticide usage
- E. None of the Above

154. Killing mosquito larvae before they emerge as adults can reduce or \_\_\_\_\_ the need for ground or aerial application of pesticides to kill adult mosquitoes.

- A. Biological insecticides
- B. Adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Eliminate
- E. None of the Above

What are Microbial Larvicides?

155. \_\_\_\_\_ are bacteria that are registered as pesticides for control of mosquito larvae in outdoor areas such as irrigation ditches, flood water, standing ponds, woodland pools, pastures, tidal water, fresh or saltwater marshes, and storm water retention areas.

- A. Microbial larvicides
- B. Mosquito species
- C. *Bacillus thuringiensis israelensis* (Bti)
- D. Naturally occurring soil bacterium
- E. None of the Above

156. Duration of effectiveness depends primarily on the \_\_\_\_\_, the environmental conditions, the formulation of the product, and water quality.

- A. Microbial larvicides
- B. Mosquito species
- C. *Bacillus thuringiensis israelensis* (Bti)
- D. Naturally occurring soil bacterium

157. \_\_\_\_\_ may be used along with other mosquito control measures in an IPM program.

- A. Microbial larvicides
- B. Mosquito species
- C. *Bacillus thuringiensis israelensis* (Bti)
- D. Naturally occurring soil bacterium
- E. None of the Above

158. The microbial larvicides used for mosquito control are \_\_\_\_\_ and *Bacillus sphaericus* (*B. sphaericus*).

- A. Microbial larvicides
- B. Mosquito species
- C. *Bacillus thuringiensis israelensis* (Bti)
- D. Naturally occurring soil bacterium
- E. None of the Above

159. *Bacillus thuringiensis israelensis* is a \_\_\_\_\_ registered for control of mosquito larvae. Bti was first registered by the EPA as an insecticide in 1983.

- A. Microbial larvicides
- B. Mosquito species
- C. *Bacillus thuringiensis israelensis* (Bti)
- D. Naturally occurring soil bacterium
- E. None of the Above

160. Mosquito larvae eat the \_\_\_\_\_ product that is made up of the dormant spore form of the bacterium and an associated pure toxin.

- A. Microbial larvicides
- B. Mosquito species
- C. *Bacillus thuringiensis israelensis* (Bti)
- D. Naturally occurring soil bacterium
- E. None of the Above

161. The toxin disrupts the gut in the mosquito by binding to receptor cells present in insects, but not in \_\_\_\_\_.

- A. Mammals
- B. Mosquito species
- C. *Bacillus thuringiensis israelensis* (Bti)
- D. Naturally occurring soil bacterium
- E. None of the Above

162. There are \_\_\_\_\_ for use in the United States. Aquabac, Teknar, Vectobac, and LarvX are examples of common trade names for the mosquito control products.

- A. EPA as an insecticide in 1983
- B. 26 Bti products registered
- C. Registered by the EPA in 1991
- D. One to four weeks
- E. None of the Above

163. *Bacillus sphaericus* is a naturally occurring bacterium that is found throughout the world. *B. sphaericus* was initially \_\_\_\_\_ for use against various kinds of mosquito larvae.

- A. EPA as an insecticide in 1983
- B. 26 Bti products registered
- C. Registered by the EPA in 1991
- D. One to four weeks
- E. None of the Above

164. VectoLex CG and WDG are registered *B. sphaericus* products and are effective for approximately \_\_\_\_\_ after application.

- A. EPA as an insecticide in 1983
- B. 26 Bti products registered
- C. Registered by the EPA in 1991
- D. One to four weeks
- E. None of the Above

165. The microbial pesticides have undergone extensive testing prior to registration. They are essentially \_\_\_\_\_, so there are no concerns for human health effects with Bti or *B. sphaericus* when they are used according to label directions.

- A. Nontoxic to humans
- B. Pose risks to wildlife
- C. Do not pose risks
- D. Risks to human health
- E. None of the Above

Do Microbial Larvicides Pose Risks to Wildlife or the Environment?

166. Extensive testing shows that microbial larvicides \_\_\_\_\_, nontarget species, or the environment, when used according to label directions.

- A. Nontoxic to humans
- B. Pose risks to wildlife
- C. Do not pose risks to wildlife
- D. Risks to human health
- E. None of the Above

What is Methoprene?

167. Methoprene is a compound first \_\_\_\_\_ that mimics the action of an insect growth-regulating hormone and prevents the normal maturation of insect larvae.

- A. EPA as an insecticide in 1983
- B. 26 Bti products registered
- C. Registered by the EPA in 1975
- D. One to four weeks
- E. None of the Above

168. It is \_\_\_\_\_ to kill mosquito larvae, and it may be used along with other mosquito control measures in an IPM program.

- A. Solids
- B. Sand granules
- C. Applied to water
- D. Liquid and pelletized formulations
- E. None of the Above

169. Altosid is the name of the methoprene product used in mosquito control and is applied as briquettes (similar in form to charcoal briquettes), pellets, \_\_\_\_\_, and liquids.

- A. Solids
- B. Sand granules
- C. Applied to water
- D. Crystals
- E. None of the Above

170. The \_\_\_\_\_ can be applied by helicopter and fixed-wing aircraft.

- A. Solids
- B. Sand granules
- C. Applied to water
- D. Liquid and pelletized formulations
- E. None of the Above

Does Methoprene Pose Risks to Human Health?

171. Methoprene, used for mosquito control according to its label directions, \_\_\_\_\_ to human health. In addition to posing low toxicity to mammals, there is little opportunity for human exposure, since the material is applied directly to ditches, ponds, marshes, or flooded areas that are not drinking water sources.

- A. Nontoxic to humans
- B. Pose risks to wildlife
- C. Do not pose unreasonable risks
- D. Risks to human health
- E. None of the Above

172. Does Methoprene Pose Risks to Wildlife or the Environment?

Methoprene used in mosquito control programs does \_\_\_\_\_ or the environment.

- A. Nontoxic to humans
- B. Pose risks to wildlife
- C. Not pose unreasonable risks to wildlife
- D. Risks to human health
- E. None of the Above

173. Toxicity of methoprene to birds and fish is low, and it is \_\_\_\_\_.
- A. Nontoxic to humans
  - B. Pose risks to wildlife
  - C. Do not pose risks
  - D. Nontoxic to bees
  - E. None of the Above
174. Methoprene breaks down quickly in water and soil and \_\_\_\_\_ into ground water.
- A. Will not leach
  - B. Minimal acute and chronic
  - C. Do not pose risks
  - D. Risks to human health
  - E. None of the Above
175. Methoprene mosquito control products present \_\_\_\_\_ risk to freshwater fish, freshwater invertebrates, and estuarine species.
- A. Nontoxic to humans
  - B. Minimal acute and chronic
  - C. Do not pose risks
  - D. Risks to human health
  - E. None of the Above
176. Temephos is an organophosphate (OP) pesticide \_\_\_\_\_ to control mosquito larvae, and it is the only organophosphate with larvicidal use.
- A. EPA as an insecticide in 1983
  - B. 26 Bti products registered
  - C. Registered by the EPA in 1991
  - D. Registered by the EPA in 1965
  - E. None of the Above
177. It is an important \_\_\_\_\_ for mosquito control programs; its use helps prevent mosquitoes from developing resistance to the bacterial larvicides.
- A. Insecticide
  - B. To kill mosquitoes
  - C. Kill adult mosquitoes
  - D. Resistance management tool
  - E. None of the Above
178. Temephos is used in areas of \_\_\_\_\_, shallow ponds, swamps, marshes, and intertidal zones. It may be used along with other mosquito control measures in an IPM program.
- A. Running waters
  - B. Standing water
  - C. Stream breeders
  - D. Along banks
  - E. None of the Above



179. Abate is the trade name of the \_\_\_\_\_ used for mosquito control.

- A. Golden Bear 1111
- B. Oils
- C. Temephos product
- D. Chlordane
- E. None of the Above

180. Temephos is applied most commonly by \_\_\_\_\_, but can be applied by backpack sprayers, fixed-wing aircraft, and right-of-way sprayers in either liquid or granular form.

- A. Aerosol bombs
- B. Hand-carried dispersal units
- C. Helicopter
- D. Aerosol foggers
- E. None of the Above

181. It is \_\_\_\_\_, and the amount of temephos is very small in relation to the area covered, less than 1 ounce of active ingredient per acre for the liquid and 8 ounces per acre for the granular formulations.

- A. Holes and containers
- B. Annoying and potentially dangerous
- C. Unique behaviors and bite
- D. Applied to water
- E. None of the Above

Does Temephos Pose Risks to Human Health?

182. Temephos, applied according to the label for mosquito control, \_\_\_\_\_ to human health.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not unreasonable pose risks
- D. None of the Above

183. Current mosquito larviciding techniques pose \_\_\_\_\_ aquatic species and the aquatic ecosystem.

- A. Nontoxic
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Some risk to nontarget
- E. None of the Above

184. Although temephos presents \_\_\_\_\_ to birds and terrestrial species, available information suggests that it is more toxic to aquatic invertebrates than alternative larvicides.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Relatively low risk
- E. None of the Above

185. For this reason, the EPA is limiting temephos use to areas where \_\_\_\_\_ would not be effective, specifying intervals between applications, and limiting the use of high application rates.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Less-hazardous alternatives
- E. None of the Above

186. Temephos \_\_\_\_\_, and post-application exposure is minimal.

- A. Breaks down within a few days in water
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Toxin disrupts the lining of the larvae's intestine
- E. None of the Above

187. Does Temephos Pose Risks to Wildlife or the Environment?

Because temephos is applied directly to water, it is not \_\_\_\_\_ on terrestrial animals or birds.

- A. Breaks down within a few days in water
- B. Expected to have a direct impact
- C. 150 days of uninterrupted mosquito control
- D. Toxin disrupts the lining of the larvae's intestine
- E. None of the Above

Monomolecular Films?

188. Monomolecular films are low-toxicity pesticides that spread a thin film on the surface of the water that makes it difficult for mosquito \_\_\_\_\_, pupae, and emerging adults to attach to the water's surface, causing them to drown.

- A. Insecticide
- B. Deet
- C. Kill adult mosquitoes
- D. Larvae
- E. None of the Above

189. Films may remain active typically for \_\_\_\_\_ on standing water, and have been used in the United States in floodwaters, brackish waters, and ponds.

- A. One day
- B. 10-14 days
- C. One year
- D. One to four weeks
- E. None of the Above

190. They may be used along with other mosquito control measures in an IPM program. They are also known under the trade names \_\_\_\_\_ and Agnique MMF.

- A. Golden Bear 1111
- B. Arosurf MSF
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

Do Monomolecular Films Pose Risks to Human Health?

191. Monomolecular films, used according to label directions for larva and pupa control,

\_\_\_\_\_.

- A. Toxic to humans
- B. Minimal acute and chronic
- C. Do not pose risks to human health
- D. Risks to human health
- E. None of the Above

192. In addition to low toxicity, there is \_\_\_\_\_, since the material is applied directly to ditches, ponds, marshes, or flooded areas that are not drinking water sources.

- A. Little opportunity for human exposure
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to human health
- E. None of the Above

Do Films Pose Risks to Wildlife or the Environment?

193. Monomolecular films, used according to label directions for larva and pupa control, \_\_\_\_\_ to the environment.

- A. Nontoxic
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Pose minimal risks
- E. None of the Above

194. They do not last very long in the environment, and are usually applied only to standing water, such as \_\_\_\_\_, woodland pools, or containers that contain few nontarget organisms.

- A. Running waters
- B. On ponds
- C. Stream breeders
- D. Roadside ditches
- E. None of the Above

What are Oils?

195. \_\_\_\_\_, like films, are pesticides used to form a coating on top of water to drown larvae, pupae, and emerging adult mosquitoes.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

196. They are specially derived from petroleum distillates and have been used for many years in the United States to \_\_\_\_\_ on crops and orchard trees, and to control mosquitoes. They may be used along with other mosquito control measures in an IPM program.

- A. Insecticide
- B. To kill mosquitoes
- C. Kill aphids
- D. Larva
- E. None of the Above

197. Trade names for oils used in mosquito control are Bonide, BVA2, and \_\_\_\_\_.
- A. Golden Bear 1111
  - B. Oils
  - C. Chlorinated hydrocarbons
  - D. Chlordane
  - E. None of the Above

Do Oils Pose Risks to Human Health?

198. Oils, used according to label directions for larva and pupa control, \_\_\_\_\_ to human health.
- A. Nontoxic
  - B. Minimal acute and chronic
  - C. Do not pose risks
  - D. Risks
  - E. None of the Above

199. In addition to \_\_\_\_\_, there is little opportunity for human exposure, since the material is applied directly to ditches, ponds, marshes, or flooded areas that are not drinking water sources.
- A. Low toxicity
  - B. Minimal acute and chronic
  - C. Do not pose risks
  - D. Risks to human health
  - E. None of the Above

Do Oils Pose Risks to Wildlife or the Environment?

200. Oils, if misapplied, \_\_\_\_\_ and other aquatic organisms. For that reason, the EPA has established specific precautions on the label to reduce such risks.
- A. Nontoxic to humans
  - B. Minimal acute and chronic
  - C. May be toxic to fish
  - D. Risks to human health
  - E. None of the Above

Naled For Mosquito Control

201. Officials responsible for mosquito control programs make decisions to use pesticides based on an evaluation of the \_\_\_\_\_ from diseases transmitted by mosquitoes or on an evaluation of the nuisance level that communities can tolerate from a mosquito infestation.
- A. Risk of low toxicity
  - B. Risk of acute and chronic
  - C. Risks to the general public
  - D. Risks to animals
  - E. None of the Above

202. Based on surveillance and monitoring, mosquito control officials select specific pesticides and other control measures that best suit local conditions in order to achieve effective control of mosquitoes with the \_\_\_\_\_ and the environment.
- A. Nontoxic to humans
  - B. Least impact on human health
  - C. Do not pose risks
  - D. Risks to human health
  - E. None of the Above

203. It is especially important to conduct effective mosquito prevention programs by eliminating \_\_\_\_\_ or applying pesticides to control the early life stages of the mosquito.

- A. Insecticide
- B. To kill mosquitoes
- C. Breeding habitats
- D. Larvae
- E. None of the Above

204. Prevention programs, such as elimination of any standing water that could serve as a breeding site, help \_\_\_\_\_ mosquito population and the need to apply other pesticides for adult mosquito control.

- A. Insecticide
- B. To kill mosquitoes
- C. Reduce adult mosquito
- D. Larvae
- E. None of the Above

What is Naled?

205. Naled is an organophosphate (OP) insecticide that has been \_\_\_\_\_ for use in the United States.

- A. EPA as an insecticide in 1983
- B. 26 Bti products registered
- C. Registered by the EPA in 1975
- D. Registered since 1959
- E. None of the Above

206. When applied in accordance with the rate of application and the safety precautions specified on the label, Naled can be used to kill mosquitoes without posing unreasonable \_\_\_\_\_ or the environment.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to human health
- E. None of the Above

How is Naled Used in Mosquito Control?

207. Naled is an adulticide used to \_\_\_\_\_. In mosquito control programs conducted by state or local authorities, Naled is applied by truck-mounted or aircraft-mounted sprayers.

- A. Insecticide
- B. To kill mosquitoes
- C. Kill adult mosquitoes
- D. Larva
- E. None of the Above

208. Naled is applied as an Ultra-low volume (ULV) spray. \_\_\_\_\_ sprayers dispense very fine aerosol droplets that stay aloft and kill mosquitoes on contact.

- A. Golden Bear 1111
- B. Oils
- C. Ultra-low volume (ULV)
- D. Chlordane
- E. None of the Above

209. For mosquito control, Naled is applied at a maximum rate of \_\_\_\_\_ of active ingredient per acre for aerial application and 0.1 pounds (0.33 ounce) per acre for ground application, which minimizes exposure and risks to people and the environment.

- A. 100 to 500
- B. 3 to 4 broods
- C. In water
- D. 0.05 pounds (0.8 ounce)
- E. None of the Above

Does Naled Pose Risks to Human Health?

210. Naled can be used for public health mosquito control programs without posing unreasonable \_\_\_\_\_ when applied according to the label.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to the general population
- E. None of the Above

211. The EPA has estimated the exposure and \_\_\_\_\_ posed by ULV aerial and ground applications of Naled.

- A. Nontoxic to humans
- B. Risks to both adults and children
- C. Do not pose risks
- D. Minimal acute and chronic
- E. None of the Above

212. Because of the very small amount of active ingredient released per acre of ground, the estimates found that for all scenarios considered, exposures were hundreds or even thousands of times below an amount that \_\_\_\_\_.

- A. Nontoxic to humans
- B. Risks to both adults and children
- C. Might pose a health concern
- D. Minimal acute and chronic
- E. None of the Above

213. These estimates assumed several spraying events over a period of weeks, and also assumed that a toddler would ingest some soil and grass in addition to skin and \_\_\_\_\_.

- A. Nausea
- B. Dizziness
- C. Do not pose risks
- D. Inhalation exposure
- E. None of the Above

214. Naled like other organophosphates, can over stimulate the nervous system causing \_\_\_\_\_, dizziness, or confusion.

- A. Nausea
- B. Convulsions
- C. Do not pose risks
- D. Minimal acute and chronic
- E. None of the Above

215. Severe high-dose poisoning with any organophosphate can cause convulsions, respiratory paralysis, and \_\_\_\_\_.

- A. Nausea
- B. Dizziness
- C. Do not pose risks
- D. Death
- E. None of the Above

216. Does Naled Pose Risks to Wildlife or the Environment?

Naled used in mosquito control programs does not pose unreasonable \_\_\_\_\_ or the environment.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Risks to wildlife
- D. Risks to human health
- E. None of the Above

217. Naled degrades rapidly in the environment, and it displays \_\_\_\_\_ to birds and mammals.

- A. Nontoxic
- B. Low toxicity
- C. Do not pose risks
- D. Extreme risks
- E. None of the Above

218. \_\_\_\_\_ risk to fish is not expected, but there is potential for risks to invertebrates from the repeated use of Naled.

- A. Toxic
- B. Acute and chronic
- C. Do not pose risks
- D. High risks
- E. None of the Above

219. Naled is \_\_\_\_\_ to insects, including beneficial insects such as honeybees. For that reason, the EPA has established specific precautions on the label to reduce such risk.

- A. Nontoxic
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Highly toxic
- E. None of the Above

What are Synthetic Pyrethroids?

220. Pyrethroids are synthetic chemical insecticides that act in a similar manner to \_\_\_\_\_, which are derived from chrysanthemum flowers.

- A. Golden Bear 1111
- B. Pyrethrins
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

221. Pyrethroids are widely used for controlling various insects. Permethrin, \_\_\_\_\_, and sumithrin are synthetic pyrethroids commonly used in mosquito control programs to kill adult mosquitoes.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Resmethrin
- E. None of the Above

222. Permethrin has been \_\_\_\_\_. It is currently registered and sold in a number of products such as household insect foggers and sprays, tick and flea sprays for yards, flea dips and sprays for cats and dogs, termite treatments, agricultural and livestock products, and mosquito abatement products.

- A. EPA as an insecticide in 1983
- B. Registered by the EPA since 1977
- C. Registered by the EPA in 1975
- D. Registered by the EPA since 1998
- E. None of the Above

223. Resmethrin has been \_\_\_\_\_ and is used to control flying and crawling insects in the home, lawn, garden, and industrial sites. It can also be used to control insects on ornamental plants (outdoor and greenhouse use), on pets and horses, and as a mosquitocide..

- A. EPA as an insecticide in 1983
- B. Registered by the EPA since 1977
- C. Registered by the EPA in 1975
- D. Registered by the EPA since 1971
- E. None of the Above

224. Sumithrin has been \_\_\_\_\_ and is used to control adult mosquitoes and as an insecticide in transport vehicles such as aircraft, ships, railroad cars, and truck trailers.

- A. EPA as an insecticide in 1983
- B. Registered by the EPA since 1977
- C. Registered by the EPA in 1975
- D. Registered by the EPA since 1971
- E. None of the Above

#### Synthetic Pyrethroids Used in Adult Mosquito Control

225. Most \_\_\_\_\_ control products can be applied only by public health officials and trained personnel of mosquito control districts.

- A. Aerosol bombs
- B. Hand-carried dispersal units
- C. ULV spraying
- D. Aerosol foggers
- E. None of the Above

226. Mosquito control professionals apply pyrethroids as an \_\_\_\_\_ spray. Ultra-low volume (ULV) sprayers dispense very fine aerosol droplets that stay aloft and kill adult mosquitoes on contact.

- A. Golden Bear 1111
- B. Oils
- C. Ultra-low volume (ULV)
- D. Chlordane
- E. None of the Above



227. Pyrethroids used in mosquito control are typically mixed with a synergist compound, such as \_\_\_\_\_, which enhances the effectiveness of the active ingredient.

- A. Golden Bear 1111
- B. Piperonyl butoxide
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

228. The product is often diluted in water or oil and applied at rates \_\_\_\_\_ of a pound of active ingredient or less than 4 fluid ounces of mixed formulation per acre.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. In water
- D. Less than 1/100th
- E. None of the Above

Do Pyrethroids Pose Risks to Human Health?

229. Pyrethroids can be used for public health mosquito control programs without posing unreasonable \_\_\_\_\_ when applied according to the label.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to human health
- E. None of the Above

230. Pyrethroids are considered to pose \_\_\_\_\_ to humans, but at high doses, pyrethroids can affect the nervous system.

- A. Nontoxic
- B. Minimal acute and chronic
- C. Slight risks of acute toxicity
- D. Risks
- E. None of the Above

Do Pyrethroids Pose Risks to Wildlife or the Environment?

231. Pyrethroids used in mosquito control programs \_\_\_\_\_ risks to wildlife or the environment.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not pose unreasonable
- D. Risks to human health
- E. None of the Above

232. Pyrethroids, when applied at mosquito control rates, are low in toxicity to mammals, and are practically \_\_\_\_\_ to birds.

- A. Nontoxic
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to
- E. None of the Above

233. Mosquito control formulations of permethrin break down in the environment, and \_\_\_\_\_ and sunlight accelerate this process.

- A. Running waters
- B. High temperatures
- C. Stream breeders
- D. Cold weather
- E. None of the Above

234. Pyrethroids are \_\_\_\_\_ to fish and to bees. For this reason, the EPA has established specific precautions on the label to reduce such risks, including restrictions that prohibit the direct application of products to open water or within 100 feet of lakes, streams, rivers, or bays.

- A. Nontoxic
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Toxic
- E. None of the Above

*Anopheles* spp.

Of the insects that serve as vectors for parasitic diseases, this genus is arguably the most important.

235. Of the approximately \_\_\_\_\_ of *Anopheles*, about two dozen serve as vectors for malaria (*Plasmodium* spp.) in humans.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. 422 species
- D. 300
- E. None of the Above

236. About \_\_\_\_\_ of the protozoan *Plasmodium* that causes malaria, but only about 40 are important.

- A. 100 to 500 larvae
- B. 70 are vectors
- C. All are virus
- D. 1 of 2
- E. None of the Above

237. Malaria infects \_\_\_\_\_ people and kills 1.5-2.7 million people each year, making it by far the most serious of the diseases spread by insects.

- A. 100 to 500
- B. 300-500 million
- C. 1 of two
- D. 5 billion
- E. None of the Above

238. *Culex pipiens*, the \_\_\_\_\_ has a distribution that roughly includes the northern half of the United States.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

239. The species is replaced by \_\_\_\_\_, the Southern House Mosquito, in the southern United States with limited overlap in portions of the Midwest.
- A. *Culex quinquefasciatus*
  - B. *Culex pipiens*
  - C. *Culex restuans*
  - D. Hibernating females
  - E. None of the Above
240. \_\_\_\_\_ provides the life cycle model for most of the domestic *Culex* in temperate areas. Inseminated adult females from the last generation of the season build body fat by feeding on carbohydrates and enter hibernation in fall.
- A. *Culex quinquefasciatus*
  - B. *Culex pipiens*
  - C. *Culex restuans*
  - D. Hibernating females
  - E. None of the Above
241. The \_\_\_\_\_ pass the winter in diapause and do not become active during periods of warm winter weather.
- A. *Culex quinquefasciatus*
  - B. *Culex pipiens*
  - C. *Culex restuans*
  - D. Females
  - E. None of the Above
242. \_\_\_\_\_ are common in basements, outbuildings, and subterranean enclosures.
- A. *Culex quinquefasciatus*
  - B. *Culex pipiens*
  - C. *Culex restuans*
  - D. Hibernating females
  - E. None of the Above
243. Like \_\_\_\_\_, the females congregate near moisture and move their resting location during the winter to remain in a humid atmosphere.
- A. *Culex quinquefasciatus*
  - B. *Culex pipiens*
  - C. *Culex restuans*
  - D. Hibernating females
  - E. None of the Above
244. Mortality can be extensive during periods of \_\_\_\_\_.
- A. *Culex quinquefasciatus*
  - B. *Culex pipiens*
  - C. *Culex restuans*
  - D. Winter drought
  - E. None of the Above

245. \_\_\_\_\_ emerge from hibernation during May and begin depositing egg rafts in suitable habitat.
- A. *Culex quinquefasciatus*
  - B. *Culex pipiens*
  - C. *Culex restuans*
  - D. Females
  - E. None of the Above
246. Populations of this mosquito usually peak during August, but \_\_\_\_\_ well into September.
- A. *Culex quinquefasciatus*
  - B. *Culex pipiens*
  - C. *Culex restuans*
  - D. Hibernating females
  - E. None of the Above
247. The adults from the \_\_\_\_\_ of the season lose all interest in blood meal hosts but will move in and out of overwintering sites during periods of mild fall weather.
- A. Last generation
  - B. Breeding habitats
  - C. Temporary ground water
  - D. Deposits its eggs
  - E. None of the Above
248. Larvae rarely persist in \_\_\_\_\_ after females have entered hibernation.
- A. Last generation
  - B. Breeding habitats
  - C. Temporary ground water
  - D. Deposits its eggs
  - E. None of the Above
249. \_\_\_\_\_ can be found in a fairly wide range of larval habitats, but are generally associated with water that has a high organic content.
- A. *Culex quinquefasciatus*
  - B. *Culex pipiens*
  - C. *Culex restuans*
  - D. Hibernating females
  - E. None of the Above
250. The species utilizes \_\_\_\_\_ that ranges from mildly to grossly polluted.
- A. Last generation
  - B. Breeding habitats
  - C. Temporary ground water
  - D. Deposits its eggs
  - E. None of the Above
251. The species also \_\_\_\_\_ in artificial containers, including tin cans, tires, and any refuse that allows stagnant water to puddle.
- A. Last generation
  - B. Breeding habitats
  - C. Temporary ground water
  - D. Deposits its eggs
  - E. None of the Above

252. The species is decidedly urban and reaches greatest numbers in large urban centers. Catch basins and storm drains provide ideal habitat for \_\_\_\_\_.

- A. *Culex quinquefasciatus*
- B. *Cx. pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

253. The species becomes particularly abundant in areas where raw sewage leaks into subterranean drainage systems. \_\_\_\_\_ and slaughter house drainage ponds support high populations of this species.

- A. Meat packing plants
- B. Eastern seaboard
- C. Gulf Coast region
- D. Sumps on farms
- E. None of the Above

254. \_\_\_\_\_ can always be collected in the effluent from sewage treatment plants.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

#### Collection

255. No special techniques are required to collect \_\_\_\_\_ larvae. This species is common in urban settings and can usually be found in significant numbers in a variety of habitats where stagnant water collects.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

256. \_\_\_\_\_ will oviposit readily in buckets containing prepared straw infusions. Most piles of discarded tires contain a mixture of *Cx. pipiens* and *Cx. restuans* in addition to the tire-breeding *Aedes*.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

257. \_\_\_\_\_ occurs on every continent except Antarctica and is the most widely distributed mosquito in the world.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

258. In North America, two races range north (*Cx. pipiens pipiens*) and south (*Cx. pipiens quinquefasciatus*) of 39°N latitude, about the level of Sacramento. *Cx. p. pipiens* lives in the milder coastal climate areas, while *Cx. p. quinquefasciatus* is found in the \_\_\_\_\_.

- A. Meat packing plants
- B. Eastern seaboard
- C. Warmer inland valleys
- D. Sumps on farms
- E. None of the Above

259. \_\_\_\_\_ main host is wild birds, but it also feeds freely on a wide variety of warm-blooded vertebrates, including man.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

260. In northern California, it currently plays only a lesser role as a carrier of human disease, while in southern California and the \_\_\_\_\_, it is a major carrier of Saint Louis encephalitis.

- A. Meat packing plants
- B. Eastern seaboard
- C. Gulf Coast region
- D. Sumps on farms
- E. None of the Above

261. It is also the best known carrier of West Nile Virus, a severe encephalitis virus newly arrived in the Americas that is spreading along the \_\_\_\_\_.

- A. Meat packing plants
- B. Eastern seaboard
- C. Gulf Coast region
- D. Sumps on farms
- E. None of the Above

262. \_\_\_\_\_ is a serious pest, called the "house mosquito" because it commonly develops in small containers around the home.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

263. It shows great skill in finding ways to get into the house, where it feeds on the occupants at night. It also occurs in containers and \_\_\_\_\_ and industrial plants, in polluted waters, and will feed out-of-doors at night.

- A. Meat packing plants
- B. Eastern seaboard
- C. Gulf Coast region
- D. Sumps on farms
- E. None of the Above

264. \_\_\_\_\_ larvae typically develop best in dirty, stagnant water containing abundant organic matter, in ground pools and natural and man-made containers.

- A. Culex quinquefasciatus
- B. Culex pipiens
- C. Culex restuans
- D. Hibernating females
- E. None of the Above

265. Vector technicians often find improperly installed or maintained \_\_\_\_\_ producing huge numbers of this species.

- A. Meat packing plants
- B. Eastern seaboard
- C. Gulf Coast region
- D. Underground septic tanks
- E. None of the Above

266. The mosquitoes gain entrance through \_\_\_\_\_, through poorly fitting or unsealed covers, or by the vent pipes made for removal of gases.

- A. Meat packing plants
- B. Eastern seaboard
- C. Cracks in the ground
- D. Sumps on farms
- E. None of the Above

267. Most larval samples from \_\_\_\_\_ consist mainly of Cx. pipiens and Cx restuans. Culex pipiens larvae are easily distinguished from Cx. restuans by the length and shape of the antennae.

- A. Meat packing plants
- B. Eastern seaboard
- C. Polluted water sources
- D. Sumps on farms
- E. None of the Above

Where does this Mosquito normally lay its Eggs?

268. In tin cans, buckets, discarded tires and other artificial containers that \_\_\_\_\_.

- A. Discerned with practice
- B. Hold stagnant water
- C. Build body fat
- D. State of torpor
- E. None of the Above

269. In unintended bird baths, clogged rain gutters and plastic wading pools that \_\_\_\_\_.

- A. Discerned with practice
- B. Hold stagnant water
- C. Build body fat
- D. State of torpor
- E. None of the Above

270. In \_\_\_\_\_ and catch basins in urban areas.

- A. Discerned with practice
- B. Hold stagnant water
- C. Catch basins
- D. State of torpor
- E. None of the Above

271. In septic seepage and other foul water sources above or \_\_\_\_\_.

- A. Below ground level
- B. Hold stagnant water
- C. Build body fat
- D. State of torpor
- E. None of the Above

How does this Mosquito Overwinter?

272. The last generation of adult females mate and \_\_\_\_\_ by feeding on carbohydrates.

- A. Discerned with practice
- B. Hold stagnant water
- C. Build body fat
- D. State of torpor
- E. None of the Above

273. Mated females \_\_\_\_\_ in culverts, basements, and protected areas that stay above freezing.

- A. Discerned with practice
- B. Hold stagnant water
- C. Build body fat
- D. Find refuge
- E. None of the Above

274. The body metabolism slows considerably and winter is spent in a \_\_\_\_\_.

- A. Discerned with practice
- B. Hold stagnant water
- C. Build body fat
- D. State of torpor
- E. None of the Above

275. Females that survive the winter blood feed in spring and lay eggs that \_\_\_\_\_ populations.

- A. Discerned with practice
- B. Produce the summer
- C. Build body fat
- D. State of torpor
- E. None of the Above

Antennal Shape

276. The characteristic antennal shape is difficult to see in the dipper, but the slightly longer, constricted antennae and \_\_\_\_\_ can be discerned with practice.

- A. Discerned with practice
- B. Hold stagnant water
- C. Build body fat
- D. Prominent antennal tufts
- E. None of the Above



277. The \_\_\_\_\_ on the siphon can be used as a diagnostic character under the microscope.

- A. Discerned with practice
- B. Multiple hair tufts
- C. Build body fat
- D. State of torpor
- E. None of the Above

278. *Culex salinarius* is a closely related species that is easily distinguished by the longer,

- \_\_\_\_\_.
- A. Discerned with practice
  - B. More slender siphon
  - C. Build body fat
  - D. State of torpor
  - E. None of the Above

St. Louis Encephalitis

279. SLE is a natural \_\_\_\_\_ found in a variety of wild birds.

- A. Infection
- B. SLE
- C. Indicator of polluted water
- D. Primary vector
- E. None of the Above

280. *Culex pipiens* can function as a \_\_\_\_\_ and pass the virus from one bird to the next.

- A. Infection
- B. SLE
- C. Indicator of polluted water
- D. Vector
- E. None of the Above

281. If virus is introduced to an urban setting, *Culex pipiens* can amplify the \_\_\_\_\_ in urban birds.

- A. Infection
- B. SLE
- C. Indicator of polluted water
- D. Primary vector
- E. None of the Above

282. House Sparrows, an introduced species, circulate exceptionally high levels of \_\_\_\_\_ when they become infected.

- A. Infection
- B. SLE
- C. Indicator of polluted water
- D. Primary vector
- E. None of the Above

283. *Culex pipiens* that bite infected birds acquire the \_\_\_\_\_ and are capable of passing it on to humans.

- A. Infection
- B. SLE
- C. Virus
- D. Primary vector
- E. None of the Above

Summary

284. \_\_\_\_\_ is usually the most common pest mosquito in urban and suburban settings.

- A. Infection
- B. SLE
- C. *Culex pipiens*
- D. Primary vector
- E. None of the Above

285. \_\_\_\_\_ is an indicator of polluted water in the immediate vicinity.

- A. Infection
- B. SLE
- C. *Culex pipiens*
- D. Primary vector
- E. None of the Above

286. *Culex pipiens* is recognized as the primary vector of \_\_\_\_\_.

- A. Infection
- B. SLE
- C. *Culex pipiens*
- D. Primary vector
- E. None of the Above

287. \_\_\_\_\_ is normally considered to be a bird feeder.

- A. Infection
- B. SLE
- C. *Culex pipiens*
- D. Primary vector
- E. None of the Above

288. Some \_\_\_\_\_ have a predilection for mammalian hosts and feed readily on humans.

- A. Infection
- B. SLE
- C. Urban strains
- D. Primary vector
- E. None of the Above

289. Most populations probably contain individuals that \_\_\_\_\_ from mammals as well as birds.

- A. Infection
- B. SLE
- C. Accept blood
- D. Primary vector
- E. None of the Above

Pale Marsh Mosquito *Ochlerotatus dorsalis*

290. *Ochlerotatus dorsalis*' common name comes from its whitish-grey appearance: the abdomen and wings have intermixed narrow light and dark scales. Sometimes the \_\_\_\_\_.

- A. Light scales predominate
- B. Seasonally flooded
- C. Last adults emerging
- D. Brackish marshes
- E. None of the Above

291. In California, it occurs along the Pacific coast and in the eastern regions of the state. It breeds along the edges of bays, \_\_\_\_\_. It is especially frequent in the seasonally flooded marshes along the edges of the San Francisco and San Pablo Bays.

- A. Light scales predominate
- B. Seasonally flooded
- C. Last adults emerging
- D. Marshes and lakes
- E. None of the Above

292. A strong flyer, *Ochlerotatus dorsalis* often disperses \_\_\_\_\_ or more from its breeding sources. Unlike most other local *Ochlerotatus*, the pale marsh mosquito is active almost year-around.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. In water
- D. 20 miles
- E. None of the Above

293. Females produce continuous broods throughout the spring and summer, with 8 to 12 hatches each year, and the \_\_\_\_\_ in October.

- A. Light scales predominate
- B. Seasonally flooded
- C. Last adults emerging
- D. Brackish marshes
- E. None of the Above

294. Pre-adult stages can be as short as \_\_\_\_\_ in the warm summer weather.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. In water
- D. 1 to 2 weeks
- E. None of the Above

295. Populations sometimes build up to huge numbers in \_\_\_\_\_ subject to prolonged spring flooding.

- A. Light scales predominate
- B. Seasonally flooded
- C. Last adults emerging
- D. Brackish marshes
- E. None of the Above

296. *Ochlerotatus dorsalis* is a serious pest mosquito and a \_\_\_\_\_ of the encephalitis virus. Females prefer to feed on large mammals like cattle and horses (and man) when these are available.

- A. Light scales predominate
- B. Seasonally flooded
- C. Secondary vector
- D. Brackish marshes
- E. None of the Above

297. They are \_\_\_\_\_, and so aggressive and persistent that livestock tend to move away from areas where they are numerous.

- A. Highest malaria infection rates
- B. Malaria vector
- C. Vicious biters
- D. Bite man aggressively
- E. None of the Above

Western Malaria Mosquito *Anopheles freeborni*

298. *Anopheles freeborni* is the most important \_\_\_\_\_ in California. In our lifetime, endemic malaria has been eradicated from the U.S. But in our grandparents' time, it was so serious that education guidelines called for it to be included in the instructional program in every primary school.

- A. Highest malaria infection rates
- B. Malaria vector
- C. Active infections
- D. Bite man aggressively
- E. None of the Above

299. Today, carrier mosquitoes still occur throughout the state, and hundreds of \_\_\_\_\_ are discovered every year in tourists and immigrants from other countries.

- A. Highest malaria infection rates
- B. Malaria vector
- C. Active infections
- D. Bite man aggressively
- E. None of the Above

300. *Anopheles* are \_\_\_\_\_ from other mosquitoes: their eggs are laid individually and have small floats on each side; the larvae lack the long breathing tube found in other mosquitoes; adults have hairs, but no scales on the abdomen and both sexes have palpi as long as the proboscis.

- A. Highest malaria infection rates
- B. Malaria vector
- C. Active infections
- D. Easily distinguished
- E. None of the Above

**You are finished with your assignment. Please fax, mail or e-mail your assignment along with your registration form and survey sheet. Always call later to ensure we've received the assignment. Fax (928) 272-0747 e-mail [info@tlch2o.com](mailto:info@tlch2o.com)**

**Fax a copy of your driver's license too.**

## **Mosquito Control CEU Training Assignment #2 For Last Names F-K**

You will have 90 days from the start of this course to have successfully passed this assignment with a score of 70 %. You may e mail the answers to TLC, info@tlch2o.com or fax the answers to TLC, (928) 272-0747. This assignment is available to you in a Word Format on TLC's Website. You can find online assistance for this course on the in the Search function on Adobe Acrobat PDF to help find the answers. Once you have paid the course fee, you will be provided complete course support from Student Services (928) 468-0665.

Assignment #1 for all pest applicators whose names start with the letter A- E.

Assignment #2 for all pest applicators whose last names start with F-K.

Assignment #3 for all pest applicators whose last name starts with the letter L-P.

Assignment #4 for all pest applicators whose last name starts with the letter Q-R.

Assignment #5 for all pest applicators whose last name starts with the letter S-Z.

### **Multiple Choice Section, Mosquito Terms. Mosquito Identification Section**

1. Eastern Treehole Mosquito

- A. Aedes tivittatus
- B. Aedes triseriatus
- C. Aedes canadensis
- D. Aedes albopictus
- E. None of the Above

2. Asian Tiger Mosquito

- A. Aedes tivittatus
- B. Aedes triseriatus
- C. Aedes canadensis
- D. Aedes albopictus
- E. None of the Above

3. Banded Spring Mosquito

- A. Aedes tivittatus
- B. Aedes triseriatus
- C. Aedes canadensis
- D. Aedes albopictus
- E. None of the Above

4. Flood-water Mosquito

- A. Aedes tivittatus
- B. Aedes triseriatus
- C. Aedes canadensis
- D. Aedes albopictus
- E. None of the Above

5. Vexans Mosquito  
A. Anopheles quadrimaculatus  
B. Culex pipiens  
C. Coquillettidia perturbans  
D. Aedes vexans  
E. None of the Above

6. Northern House Mosquito  
A. Anopheles quadrimaculatus  
B. Culex pipiens  
C. Coquillettidia perturbans  
D. Aedes vexans  
E. None of the Above

7. Cattail Mosquito  
A. Anopheles quadrimaculatus  
B. Culex pipiens  
C. Coquillettidia perturbans  
D. Aedes vexans  
E. None of the Above

8. Common Malaria Mosquito  
A. Anopheles quadrimaculatus  
B. Culex pipiens  
C. Coquillettidia perturbans  
D. Aedes vexans  
E. None of the Above

**Identify the Definition or Term**

9. Inflammation of the brain, which can be caused by numerous viruses, including West Nile Virus endemic the normal presence of a disease or infectious agent among human beings within a geographic area.

- A. Enzootic  
B. Encephalitis  
C. Endemic  
D. Epizootic  
E. None of the Above

10. A disease naturally present in certain human or animal populations.

- A. Enzootic  
B. Encephalitis  
C. Endemic  
D. Epizootic  
E. None of the Above

11. A disease naturally present in certain animal populations (sometimes used in contrast with "endemic").

- A. Enzootic  
B. Encephalitis  
C. Endemic  
E. None of the Above

12. A disease outbreak affecting certain human or animal populations.
- A. Enzootic
  - B. Encephalitis
  - C. Endemic
  - D. Epizootic
  - E. None of the Above
13. A disease outbreak affecting certain animal populations (sometimes used in contrast with "epidemic").
- A. Enzootic
  - B. Encephalitis
  - C. Endemic
  - D. Epizootic
  - E. None of the Above
14. Agents biologic organism or chemical material that cause disease.
- A. Enzootic
  - B. Encephalitis
  - C. Endemic
  - D. Etiologic
  - E. None of the Above
15. A subset of arboviruses (transmitted by arthropods); this family of viruses includes West Nile Virus, St. Louis Encephalitis and several others.
- A. Flavivirus
  - B. Gravid Traps
  - C. Host
  - D. Intermediate Host
  - E. IPM
16. Type of mosquito traps designed to attract pregnant female mosquitoes
- A. Flavivirus
  - B. Gravid Traps
  - C. Host
  - D. Intermediate Host
  - E. None of the Above
17. A living organism that serves as a blood source for blood-feeding arthropods, or on which a parasite lives.
- A. Flavivirus
  - B. Gravid Traps
  - C. Host
  - E. None of the Above
18. The arthropod carrier of a parasitic organism.
- A. Flavivirus
  - B. Gravid Traps
  - C. Host
  - D. Intermediate Host
  - E. None of the Above

19. A system for minimizing the impact of vectors and pests by using a variety of control procedures, and decreasing the chemical input to the environment.
- A. Flavivirus
  - B. Gravid Traps
  - C. Host
  - D. IPM
  - E. None of the Above
20. Immature mosquitoes; stage which hatches from the egg, prior to adult stage.
- A. Larvae
  - B. Autochthonous
  - C. Adulticide
  - D. Larvicide
  - E. None of the Above
21. A type of pesticide used to eradicate immature mosquitoes (larvae).
- A. Larvae
  - B. Autochthonous
  - C. Adulticide
  - D. Larvicide
  - E. None of the Above
22. A type of pesticide used to kill adult mosquitoes.
- A. Larvae
  - B. Autochthonous
  - C. Adulticide
  - D. Larvicide
  - E. None of the Above
23. Native to a place; not imported; used to describe a disease transmitted by vectors that became infected from a local source.
- A. Larvae
  - B. Autochthonous
  - C. Adulticide
  - D. Larvicide
  - E. None of the Above
24. A type of larvicide; chemical that is used to prevent mosquito larvae from emerging and developing into adult mosquitoes.
- A. Methoprene
  - B. Altosid
  - C. Microbial insecticide
  - D. Bacillus Sphaericus
25. An insecticide made of bacteria whose infection kills insects; a substance produced by bacteria that is lethal to insects.
- A. Methoprene
  - B. Altosid
  - C. Microbial insecticide
  - D. Bacillus Sphaericus
  - E. Convalescent Blood Sera



26. A location where mosquitoes lay eggs, usually in stagnant water with organic material.
- A. Larvae
  - B. Autochthonous
  - C. Adulticide
  - D. Larvicide
  - E. None of the Above
27. Brand name of methoprene, a type of larvicide.
- A. Methoprene
  - B. Altosid
  - C. Microbial insecticide
  - D. Bacillus Sphaericus
  - E. None of the Above
28. A bacterium; type of biological pesticide used to eradicate mosquito larvae in water. Mosquito larvae die after ingesting this bacteria.
- A. Methoprene
  - B. Altosid
  - C. Microbial insecticide
  - D. Bacillus Sphaericus
  - E. None of the Above
29. Blood serum collected from patients recently recovered from a disease, often used to test whether a person has had a specific infection.
- A. Methoprene
  - B. Altosid
  - C. Microbial insecticide
  - D. Convalescent Blood Sera
  - E. None of the Above
30. A virus whose life cycle includes transmission by arthropods.
- A. Aseptic Meningitis
  - B. Mosquito Pools
  - C. Arthropod
  - D. Arbovirus
  - E. None of the Above
31. An invertebrate animal with jointed legs and a segmented body (includes flies, mosquitoes, ticks; also centipedes, scorpions, spiders etc.)
- A. Aseptic Meningitis
  - B. Mosquito Pools
  - C. Arthropod
  - D. Arbovirus
  - E. None of the Above
32. Inflammation of the lining of the brain and spinal cord, not due to a bacterial infection.
- A. Aseptic Meningitis
  - B. Mosquito Pools
  - C. Arthropod
  - D. Arbovirus
  - E. None of the Above

33. A group of mosquitoes collected in one area and combined at the laboratory for testing for the presence of West Nile and related viruses.

- A. Aseptic Meningitis
- B. Mosquito Pools
- C. Arthropod
- D. None of the Above

34. This chemical name **N,N-diethyl-meta-toluamide**, is the active ingredient in many insect repellent products.

- A. Malathion
- B. Naled
- C. Dursban
- D. DEET
- E. None of the Above

35. Autopsy on an animal.

- A. Aseptic Meningitis
- B. Necropsy
- C. Neurology
- D. Arbovirus
- E. None of the Above

36. The study of the nervous system and its disorders.

- A. Aseptic Meningitis
- B. Necropsy
- C. Neurology
- D. Arbovirus
- E. None of the Above

37. The jointed feelers on each side of the mouth of some arthropods.

- A. Phlebotomy
- B. Palpi
- C. Overwintering
- D. Outbreak
- E. None of the Above

38. Substance used to kill pests such as insects, mice and rats; insecticide is a form of pesticide.

- A. Phlebotomy
- B. Palpi
- C. Overwintering
- D. Pesticide
- E. None of the Above

39. Blood Drawing.

- A. Phlebotomy
- B. Palpi
- C. Overwintering
- D. Outbreak
- E. None of the Above

40. An unexpected increase in frequency or distribution of a disease
- A. Phlebotomy
  - B. Palpi
  - C. Overwintering
  - D. Outbreak
  - E. None of the Above
41. A period of rest or hibernation by which insects survive the winter
- A. Phlebotomy
  - B. Palpi
  - C. Overwintering
  - D. Outbreak
  - E. None of the Above
42. The straw-like sucking mouthparts of some blood feeding arthropods.
- A. Proboscis
  - B. Resmethrin
  - C. Rickettsia
  - D. Vectobac
  - E. None of the Above
43. Brand name for larvicide *Bacillus thuringiensis* var. *israelensis* (BTI).
- A. Proboscis
  - B. Resmethrin
  - C. Rickettsia
  - D. Vectobac
  - E. None of the Above
44. Brand name for larvicide *Bacillus sphaericus*.
- A. Proboscis
  - B. Resmethrin
  - C. Vectolex
  - D. Vectobac
  - E. None of the Above
45. A synthetic pyrethroid pesticide used to eradicate adult mosquitoes in the home, lawn, garden and at industrial sites; active ingredient in the product **Scourge**.
- A. Proboscis
  - B. Resmethrin
  - C. Rickettsia
  - D. Vectobac
  - E. None of the Above
46. A group of small bacteria that live inside tissue cells, and are carried by ticks, mites, fleas or lice.
- A. Proboscis
  - B. Resmethrin
  - C. Rickettsia
  - D. Vectobac
  - E. None of the Above

47. A method of insecticide distribution in which a small portion of the compound is fragmented into extremely fine particles for aerial dispersal.

- A. Proboscis
- B. Resmethrin
- C. Rickettsia
- D. ULV
- E. None of the Above

48. An arthropod carrier of a disease producing organism. Usually used when part of the organism's natural life cycle takes place in the arthropod (= intermediate host).

- A. Vector-borne disease
- B. Vector
- C. Vector Control Mechanism
- D. Vector control
- E. None of the Above

49. Management of organisms that carry disease.

- A. Vector-borne disease
- B. Vector
- C. Vector Control Mechanism
- D. Vector Control
- E. None of the Above

50. Instituted to control and reduce the vector population.

- A. Vector-borne disease
- B. Vector
- C. Vector Control Mechanism
- D. Vector Control
- E. None of the Above

51. Monitoring of the vector population for presence of a disease.

- A. Vector-borne disease
- B. Vector
- C. Vector Control Mechanism
- D. Vector Surveillance
- E. None of the Above

52. A disease carried by arthropod intermediate hosts.

- A. Vector-borne disease
- B. Vector
- C. Vector Control Mechanism
- D. Vector control
- E. None of the Above

53. Of or relating to a virus.

- A. Viral Encephalitis
- B. Zoonosis
- C. Viral
- D. Salt Marsh
- E. None of the Above

54. Inflammation of the brain caused by a virus.
- A. Viral Encephalitis
  - B. Zoonosis
  - C. Viral
  - D. Salt Marsh
  - E. None of the Above
55. A disease of animals that may be secondarily transmitted to man.
- A. Viral Encephalitis
  - B. Zoonosis
  - C. Viral
  - D. Salt Marsh
  - E. None of the Above
56. Areas of vegetation in bodies of salt water that may support the breeding of certain types of mosquitoes such as *Aedes sollicitans*.
- A. Viral Encephalitis
  - B. Zoonosis
  - C. Viral
  - D. Salt Marsh
  - E. None of the Above
57. The testing of birds and other animals as an early warning system for the presence of virus (e.g. sentinel chickens).
- A. Viral Encephalitis
  - B. Zoonosis
  - C. Viral
  - D. Sentinel 'Guard'
  - E. None of the Above
58. This means of, or relating to serum.
- A. Serologic
  - B. Zoonosis
  - C. Viral
  - D. Salt Marsh
  - E. None of the Above
59. Positive laboratory result of a serum sample.
- A. Serum
  - B. *Aedes Sollicitans*
  - C. *Culex Pipiens*
  - D. Sumithrin
  - E. None of the Above
60. Liquid portion of the blood containing proteins, including antibodies.
- A. Serum
  - B. *Aedes Sollicitans*
  - C. *Culex Pipiens*
  - D. Sumithrin
  - E. None of the Above

61. Container used to hold a substance producing dense smoke; used to drive away insects.
- A. Serum
  - B. Aedes Sollicitans
  - C. Culex Pipiens
  - D. Sumithrin
  - E. None of the Above
62. Mosquito-borne viral disease that causes inflammation of the brain; very similar to West Nile Virus.
- A. Serum
  - B. Aedes Sollicitans
  - C. Culex Pipiens
  - D. St. Louis Encephalitis (SLE)
  - E. None of the Above
63. A synthetic pyrethroid pesticide used to eradicate adult mosquitoes in swamps,
- A. Serum
  - B. Aedes Sollicitans
  - C. Culex Pipiens
  - D. Sumithrin
  - E. None of the Above
64. Species of mosquito, the primary known vector for West Nile virus, commonly found in urban areas; breeds in fresh but stagnant water such as backyard
- A. Serum
  - B. Aedes Sollicitans
  - C. Culex Pipiens
  - D. Sumithrin
  - E. None of the Above
65. Species of mosquito that is not known to transmit West Nile virus; breeds in salt marshes.
- A. Serum
  - B. Aedes Sollicitans
  - C. Culex Pipiens
  - D. Sumithrin
  - E. None of the Above
66. Artificial \_\_\_\_\_ are a convenient mode of transporting a species of mosquito outside of its natural range.
- A. Treehole
  - B. Insulation
  - C. Containers
  - D. Artificial
  - E. None of the Above

Mosquito Control Section

67. The mission of the Environmental Protection Agency (EPA) is to \_\_\_\_\_ and the environment.
- A. Protect human health
  - B. Minimize the risk of human exposure
  - C. Conduct surveillance for diseases
  - D. Evaluating larval populations
  - E. None of the Above

68. The EPA reviews and approves pesticides and their labeling to ensure that the pesticides used to protect public health are applied by methods which \_\_\_\_\_ and adverse health and environmental effects.

- A. Protect human health
- B. Minimize the risk of human exposure
- C. Conduct surveillance for diseases
- D. Evaluating larval populations

How Are Mosquitoes Controlled with Pesticides and Other Methods?

69. The first step in mosquito control is surveillance. Mosquito specialists \_\_\_\_\_ harbored by domestic and nonnative birds, including sentinel chickens (used as virus transmission indicators), and mosquitoes.

- A. Protect human health
- B. Minimize the risk of human exposure
- C. Conduct surveillance for diseases
- D. None of the Above

70. Surveillance for larval habitats is conducted by using maps and aerial photographs, and by \_\_\_\_\_.

- A. Protect human health
- B. Minimize the risk of human exposure
- C. Conduct surveillance for diseases
- D. Evaluating larval populations
- E. None of the Above

71. Other techniques include various light traps, biting counts, and \_\_\_\_\_.

- A. Protect human health
- B. Minimize the risk of human exposure
- C. Analysis of reports from the public
- D. Evaluating larval populations
- E. None of the Above

72. Mosquito control programs also put high priority on trying to \_\_\_\_\_, so that additional controls may not be necessary.

- A. Protect human health
- B. Minimize the risk of human exposure
- C. Conduct surveillance for diseases
- D. Prevent a large population of adult mosquitoes from developing
- E. None of the Above

73. Since mosquitoes must have water to breed, methods of prevention may include controlling water levels in lakes, marshes, ditches, or other mosquito breeding sites, \_\_\_\_\_ if possible, and stocking bodies of water with fish species that feed on larvae.

- A. Eliminating small breeding sites
- B. Minimize the risk of human exposure
- C. Conduct surveillance for diseases
- D. Evaluating larval populations
- E. None of the Above

74. Both chemical and biological measures may be employed to \_\_\_\_\_ during larval stages.

- A. Protect human health
- B. Minimize the risk of human exposure
- C. Conduct surveillance for diseases
- D. Kill immature mosquitoes
- E. None of the Above

#### Larvicides

75. \_\_\_\_\_ target larvae in the breeding habitat before they can mature into adult mosquitoes and disperse.

- A. Larvicides
- B. Mineral oils
- C. Liquid
- D. Mosquito controllers
- E. None of the Above

76. \_\_\_\_\_ include the bacterial insecticides *Bacillus thuringiensis israelensis* and *Bacillus sphaericus*, the insect growth inhibitor methoprene, and the organophosphate insecticide temephos.

- A. Larvicides
- B. Mineral oils
- C. Liquid
- D. None of the Above

77. \_\_\_\_\_ and other materials form a thin film on the surface of the water, which cause larvae and pupae to drown.

- A. Larvicides
- B. Mineral oils
- C. Liquid
- D. Mosquito controllers
- E. None of the Above

78. \_\_\_\_\_ larvicide products are applied directly to water using backpack sprayers and truck or aircraft-mounted sprayers. Tablet, pellet, granular, and briquette formulations of larvicides are also applied by mosquito controllers to breeding areas.

- A. Larvicides
- B. Mineral oils
- C. Liquid
- D. Mosquito controllers
- E. None of the Above

#### Methoprene (Altosid XR)

79. Methoprene (Altosid XR) is another safe material for control of mosquito larvae. It is an insect hormone that \_\_\_\_\_ of larvae (disrupts molting) and prevents mosquitoes from developing into adults.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Labeled for use in known fish habitats
- E. None of the Above



Altosid XR Briquettes

80. Altosid XR Briquettes \_\_\_\_\_ . Treat swamps, ponds, and marsh areas in early spring before thawing.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Labeled for use in known fish habitats
- E. None of the Above

81. These extended-release briquettes will provide up to \_\_\_\_\_ once they hit the water.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Labeled for use in known fish habitats
- E. None of the Above

82. They can be applied by hand and the product is \_\_\_\_\_ .

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Labeled for use in known fish habitats
- E. None of the Above

Microbial insecticides

83. The product known as Bti (Bacillus thuringiensis israeliensis) can be as effective as chemical insecticides. When the bacteria Bti encysts, \_\_\_\_\_ .

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. It produces a protein crystal toxic to mosquito and midge larvae
- D. Labeled for use in known fish habitats
- E. None of the Above

84. Once the bacterium has been ingested, \_\_\_\_\_ . It has no effect on a vast array of other aquatic organisms except midges in the same habitat. Bti strains are sold under the names Bactimos, Teknar and Vectobac.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. The toxin disrupts the lining of the larvae's intestine
- E. None of the Above

Mosquito Dunks or Briquettes

85. Product Description: \_\_\_\_\_ objects that release bacteria into water where mosquitoes are breeding. When the larvae feed on the bacteria, they die.

- A. Small donut shaped and sized
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Labeled for use in known fish habitats
- E. None of the Above

Juvenile Hormone

86. Methoprene (sold under the name Altosid) is an insect growth regulator widely used by abatement districts to \_\_\_\_\_.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. Control mosquito larvae
- D. Labeled for use in known fish habitats
- E. None of the Above

87. Methoprene \_\_\_\_\_, and when present in the larval habitat, it keeps immature insects from maturing into adults.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. Mimics a natural juvenile hormone
- D. Labeled for use in known fish habitats
- E. None of the Above

88. Unable to metamorphose, the mosquitoes \_\_\_\_\_.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. Die in the pupal stage
- D. Labeled for use in known fish habitats
- E. None of the Above

89. Vector control technicians sometimes use methoprene to reach larval sources that would \_\_\_\_\_.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. Otherwise be difficult or dangerous to treat
- D. Labeled for use in known fish habitats
- E. None of the Above

90. Pellets \_\_\_\_\_ into underground septic tanks known to be breeding house mosquitoes.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Can be flushed down toilets
- E. None of the Above

91. The methoprene kills the mosquitoes without upsetting the septic system's \_\_\_\_\_.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Bacterial digestive processes
- E. None of the Above

Larvicidal Oils

92. Oils have been used for mosquito control for more than a century. The Marin / Sonoma District in California uses \_\_\_\_\_, a light-viscosity oil that spreads quickly and evenly over the water surface, preventing larvae and pupae from obtaining oxygen through the surface film.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

93. \_\_\_\_\_ have always been used as a product of last resort for the control of mosquito pupae, since this stage does not feed but does require oxygen. The only other option would be draining the source.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

Chemical Larvicides

94. Chlorinated hydrocarbons like DDT and \_\_\_\_\_ are very much a thing of the past, as are the use of organophosphate and carbamate insecticides.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

95. \_\_\_\_\_ were removed from the US market in 1964, and in 1987.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

Adulticides

96. \_\_\_\_\_ control may be undertaken to combat an outbreak of mosquito-borne disease or a very heavy nuisance infestation of mosquitoes in a community.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

97. Pesticides registered for this use are \_\_\_\_\_ and are applied either by aircraft or on the ground, employing truck-mounted sprayers.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Adulticides
- E. None of the Above

98. State and local agencies commonly use the \_\_\_\_\_ Malathion and Naled and the synthetic pyrethroid insecticides Permethrin, Resmethrin, and Sumithrin for adult mosquito control.
- A. Golden Bear 1111
  - B. Oils
  - C. Organophosphate insecticides
  - D. Chlordane
  - E. None of the Above
99. Mosquito adulticides are applied as \_\_\_\_\_ sprays. \_\_\_\_\_ sprayers dispense very fine aerosol droplets that stay aloft and kill flying mosquitoes on contact.
- A. Golden Bear 1111
  - B. Oils
  - C. Ultra-low volume (ULV)
  - D. Chlordane
  - E. None of the Above
100. \_\_\_\_\_ applications involve small quantities of pesticide active ingredient in relation to the size of the area treated, typically less than 3 ounces per acre, which minimizes exposure and risks to people and the environment.
- A. Golden Bear 1111
  - B. ULV
  - C. Chlorinated hydrocarbons
  - D. Chlordane
  - E. None of the Above
101. Chemical Control of Adult Mosquitoes  
Because of environmental concerns and drift, \_\_\_\_\_ are not the most popular method.
- A. Golden Bear 1111
  - B. Oils
  - C. Chlorinated hydrocarbons
  - D. Chemical pesticides
  - E. None of the Above
102. Chemical pesticides, the technique used for adult mosquito control is known as \_\_\_\_\_ spray.
- A. Golden Bear 1111
  - B. Oils
  - C. Chlorinated hydrocarbons
  - D. Chlordane
  - E. None of the Above
103. A small quantity of the pesticide is \_\_\_\_\_ and broadcast in a fog that drifts into sites where the adult mosquitoes hide. At best, control is achieved up to 300 feet away, but it does help reduce the numbers of biting mosquitoes to tolerable levels.
- A. Aerosol bombs
  - B. Hand-carried dispersal units
  - C. ULV spraying
  - D. Atomized into micron-size particles
  - E. None of the Above

104. In recent years the use of vehicle-mounted units has decreased in favor of small, \_\_\_\_\_. This allows a more precise application of the pesticide.

- A. Aerosol bombs
- B. Hand-carried dispersal units
- C. ULV spraying
- D. Aerosol foggers
- E. None of the Above

105. The pesticide used for \_\_\_\_\_ is pyrethrum (sold as Pyrocide), a naturally occurring substance harvested from two species of Old World chrysanthemums, or pyrethrum flowers.

- A. Aerosol bombs
- B. Hand-carried dispersal units
- C. ULV spraying
- D. Aerosol foggers
- E. None of the Above

106. This material is the \_\_\_\_\_ for mosquito control, and it degrades into non-toxic by-products within 4 to 6 hours after spraying.

- A. Aerosol bombs
- B. Hand-carried dispersal units
- C. Least toxic available
- D. Aerosol foggers
- E. None of the Above

#### Indoor Control

107. Space sprays or aerosol "bombs," containing synergized pyrethrins 0.1%, are effective against adult mosquitoes. \_\_\_\_\_ may be needed during problem periods.

- A. Frequent treatments
- B. Temporary treatment
- C. One to two days of treatment
- D. Residual treatment
- E. None of the Above

#### Outdoor Control Adulticides

108. Space sprays or aerosol foggers containing pyrethrins result in rapid knockdown of adult mosquitoes. However, it is a \_\_\_\_\_ with little residual effect.

- A. Frequent treatments
- B. Temporary treatment
- C. One to two days of treatment
- D. Residual treatment
- E. None of the Above

109. \_\_\_\_\_ applied to tall grasses, weeds, trees, shrubs, and outbuildings, one to two days before use of the area, are effective.

- A. Frequent treatments
- B. Temporary treatment
- C. One to two days of treatment
- D. Residual sprays
- E. None of the Above

110. Some insecticides registered for residual mosquito control include: \_\_\_\_\_, chlorpyrifos (Dursban), and Malathion.

- A. Carbaryl (Sevin)
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

111. Malathion and \_\_\_\_\_ are extremely toxic to honey bees. Do not spray plants when in bloom. Mow weedy areas before treatment.

- A. Chlorinated hydrocarbons
- B. Oils
- C. Carbaryl (Sevin)
- D. Chlordane
- E. None of the Above

112. Bee losses are minimized by spraying late in the afternoon when bees are gone or when temperatures are below 45°F. \_\_\_\_\_ and methoxychlor are highly toxic to fish.

- A. Chlorinated hydrocarbons
- B. Oils
- C. Carbaryl (Sevin)
- D. Malathion
- E. None of the Above

Mosquito fish (*Gambusia affinis*)

113. Mosquito fish can eat \_\_\_\_\_ per day. They play an important role in mosquito control in ponds, canals, irrigated fields, and some other freshwater sources.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. Encephalitis
- D. Deet
- E. None of the Above

114. The fish live two to three years; they are live-bearing and produce \_\_\_\_\_ each year.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. Encephalitis
- D. Deet
- E. None of the Above

Repellents

115. Repellents applied to the skin and clothing will prevent mosquito bites for \_\_\_\_\_ depending on the person, type, number of mosquitoes, and the type and percent of active ingredient in the repellent.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. One to five hours
- D. Deet
- E. None of the Above

116. N, N-Diethyl-m-toluamide (Deet) is very effective and widely used as a \_\_\_\_\_, but it should not be used indiscriminately, as severe allergies can develop.

- A. Frequent treatments
- B. Temporary treatment
- C. One to two days of treatment
- D. Residual treatment
- E. None of the Above

#### Prevention

117. Since most of the mosquitoes that transmit \_\_\_\_\_ will not travel very far, the risk of contracting \_\_\_\_\_ can be minimized by controlling the mosquito breeding sites that are in close proximity to your home.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. Encephalitis
- D. Deet
- E. None of the Above

118. Water management, to prevent mosquito breeding, is essential for control. Eggs do not hatch unless they are \_\_\_\_\_.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. In water
- D. Deet
- E. None of the Above

#### Pesticides and Mosquito Control Summary

119. Mosquito-borne diseases affect millions of people worldwide each year. In the United States, some species of mosquitoes can transmit diseases such as \_\_\_\_\_, dengue fever, and malaria to humans, and a variety of diseases to wildlife and domestic animals.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Encephalitis
- D. Human exposure
- E. None of the Above

120. To combat mosquitoes and the public health hazards they present, many states and localities have established \_\_\_\_\_.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Mosquito control programs
- D. Human exposure
- E. None of the Above

121. These programs, which are based on \_\_\_\_\_, can include non-chemical forms of prevention and control, as well as ground and aerial application of chemical and biological pesticides.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Encephalitis
- D. Human exposure
- E. None of the Above

122. The mission of the Environmental Protection Agency (EPA) is to protect \_\_\_\_\_ and the environment.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Human health
- D. Human exposure
- E. None of the Above

123. The EPA reviews and approves pesticides and their labeling to ensure that the pesticides used to protect \_\_\_\_\_ are applied by methods that minimize the risk of human exposure and adverse health and environmental effects.

- A. Public health
- B. Infectious diseases
- C. Encephalitis
- D. Human exposure
- E. None of the Above

124. In relation to mosquito control, the Agency also serves as a source of information about pesticide and \_\_\_\_\_ to address the concerns of the general public, news media, and the state and local agencies dealing with outbreaks of infectious diseases or heavy infestations of mosquitoes.

- A. Non-pesticide controls
- B. Infectious diseases
- C. Encephalitis
- D. Human exposure
- E. None of the Above

#### Malathion for Mosquito Control

125. Officials responsible for mosquito control programs make decisions to use pesticides based on an evaluation of the \_\_\_\_\_ from diseases transmitted by mosquitoes or on an evaluation of the nuisance level that communities can tolerate from a mosquito infestation.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Risks to the general public
- D. Human exposure
- E. None of the Above

126. Based on \_\_\_\_\_, mosquito control officials select specific pesticides and other control measures that best suit local conditions in order to achieve effective control of mosquitoes with the least impact on human health and the environment.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Surveillance and monitoring
- D. Human exposure
- E. None of the Above

127. It is especially important to conduct effective \_\_\_\_\_ by eliminating breeding habitats or applying pesticides to control the early life stages of the mosquito.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Mosquito prevention programs
- D. Human exposure
- E. None of the Above



128. \_\_\_\_\_, such as elimination of any standing water that could serve as a breeding site, help reduce the adult mosquito population and the need to apply other pesticides for adult mosquito control.

- A. Prevention programs
- B. Infectious diseases
- C. Encephalitis
- D. Human exposure
- E. None of the Above

129. Since no pesticide can be considered 100 percent safe, pesticide applicators and the general public should always exercise care and follow specified \_\_\_\_\_ during use to reduce risks.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Safety precautions
- D. Human exposure
- E. None of the Above

What is Malathion?

130. Malathion is an organophosphate (OP) \_\_\_\_\_ that has been registered for use in the United States since 1956.

- A. Insecticide
- B. To kill mosquitoes
- C. Kill adult mosquitoes
- D. Larva
- E. None of the Above

131. When applied in accordance with the rate of application and safety precautions specified on the label, Malathion can be used \_\_\_\_\_ without posing unreasonable risks to human health or the environment.

- A. Insecticide
- B. To kill mosquitoes
- C. Kill adult mosquitoes
- D. Larva
- E. None of the Above

How is Malathion Used in Mosquito Control?

132. The mosquito goes through four distinct stages during its life cycle: egg, larva, pupa, and adult. Malathion is an adulticide, used to \_\_\_\_\_.

- A. Insecticide
- B. To kill mosquitoes
- C. Kill adult mosquitoes
- D. Larva
- E. None of the Above

133. In mosquito control programs conducted by state or local authorities, Malathion is applied by truck-mounted or \_\_\_\_\_.

- A. Insecticide
- B. Aircraft-mounted sprayers
- C. Kill adult mosquitoes
- D. Ultra-low volume (ULV) spray
- E. None of the Above

134. Malathion is applied as an \_\_\_\_\_. \_\_\_\_\_ sprayers dispense very fine aerosol droplets that stay aloft and kill mosquitoes on contact. \_\_\_\_\_ applications involve small quantities of pesticide active ingredient in relation to the size of the area treated.

- A. Insecticide
- B. Aircraft-mounted sprayers
- C. Kill adult mosquitoes
- D. Ultra-low volume (ULV) spray
- E. None of the Above

135. For mosquito control, Malathion is applied at a maximum rate of 0.23 pounds (or about 2.5 fluid ounces) of active ingredient per acre, which \_\_\_\_\_ exposure and risks to people and the environment.

- A. Minimizes
- B. Kill mosquitoes
- C. Maximizes
- D. Kill larva
- E. None of the Above

136. Malathion can be used for \_\_\_\_\_ programs without posing unreasonable risks to the general population when applied according to the label.

- A. Public health mosquito control
- B. Adults and children
- C. Small amount of active ingredient
- D. Skin and inhalation exposure
- E. None of the Above

137. The EPA has estimated the exposure and risks to both \_\_\_\_\_ posed by ULV aerial and ground applications of Malathion.

- A. Public health mosquito control
- B. Adults and children
- C. Small amount of active ingredient
- D. Skin and inhalation exposure
- E. None of the Above

138. Because of the very \_\_\_\_\_ released per acre of ground, the estimates found that for all scenarios considered, exposures were hundreds or even thousands of times below an amount that might pose a health concern.

- A. Public health mosquito control
- B. Adults and children
- C. Small amount of active ingredient
- D. Skin and inhalation exposure
- E. None of the Above

139. These estimates assumed several spraying events over a period of weeks, and also assumed that a toddler would ingest some soil and grass in addition to \_\_\_\_\_.

- A. High-dose poisoning
- B. Nausea, dizziness, or confusion
- C. Small amount of active ingredient
- D. Skin and inhalation exposure
- E. None of the Above

140. At high doses, Malathion, like other organophosphates, can overstimulate the nervous system, causing \_\_\_\_\_.

- A. High-dose poisoning
- B. Nausea, dizziness, or confusion
- C. Small amount of active ingredient
- D. Skin and inhalation exposure
- E. None of the Above

141. Severe \_\_\_\_\_ with any organophosphate can cause convulsions, respiratory paralysis, and death.

- A. Public health mosquito control
- B. Adults and children
- C. High-dose poisoning
- D. Skin and inhalation exposure
- E. None of the Above

142. Malathion used in mosquito control programs does not pose unreasonable \_\_\_\_\_ or the environment.

- A. Risks to wildlife
- B. Low toxicity
- C. Toxic to insects
- D. To reduce risks
- E. None of the Above

143. Malathion degrades rapidly in the environment, especially in moist soil, and it displays \_\_\_\_\_ to birds and mammals.

- A. Risks to wildlife
- B. Low toxicity
- C. Toxic to insects
- D. To reduce risks
- E. None of the Above

144. Malathion is highly \_\_\_\_\_, including beneficial insects such as honeybees.

- A. Risks to wildlife
- B. Low toxicity
- C. *Toxic to insects*
- D. To reduce risks
- E. None of the Above

145. For that reason, the EPA has established specific precautions on the label to reduce such \_\_\_\_\_.

- A. *Risks*
- B. Low toxicity
- C. *Toxic to insects*
- D. To reduce risks
- E. None of the Above

Larvicides For Mosquito Control

146. Prevention programs, such as the elimination of any standing water that could serve as a breeding site, help reduce the adult \_\_\_\_\_ and the need to apply other pesticides for adult mosquito control.

- A. Risks to wildlife
- B. Mosquito population
- C. Toxic to insects
- D. To reduce risks
- E. None of the Above

147. Since no pesticide can be considered 100 percent safe, pesticide applicators and the general public should always exercise care and follow specified safety precautions during use \_\_\_\_\_.

- A. Risks to wildlife
- B. Low toxicity
- C. Toxic to insects
- D. To reduce risks
- E. None of the Above

Larvicides

148. Larvicides kill mosquito larvae. Larvicides include \_\_\_\_\_, such as the microbial larvicides *Bacillus sphaericus* and *Bacillus thuringiensis israelensis*.

- A. Biological insecticides
- B. Adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Pesticide usage
- E. None of the Above

149. Larvicides include other pesticides, such as temephos, methoprene, oils, and monomolecular films. Larvicide treatment of breeding habitats help reduce the \_\_\_\_\_ in nearby areas.

- A. Biological insecticides
- B. Adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Pesticide usage
- E. None of the Above

How are Larvicides Used in Mosquito Control?

150. State and local agencies in charge of mosquito control typically employ a variety of techniques in an \_\_\_\_\_ program.

- A. Biological insecticides
- B. Adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Pesticide usage
- E. None of the Above

151. An IPM approach includes surveillance, \_\_\_\_\_, larviciding, and adulticiding to control mosquito populations.

- A. Biological insecticides
- B. Adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Source reduction
- E. None of the Above

152. Since mosquitoes must have water to breed, source reduction can be as simple as turning over trapped water in a container to undertaking large-scale \_\_\_\_\_ of marsh water levels.

- A. Engineering and management
- B. Adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Pesticide usage
- E. None of the Above

153. Larviciding involves applying pesticides to breeding habitats to kill mosquito larvae. Larviciding can reduce overall \_\_\_\_\_ in a control program.

- A. Biological insecticides
- B. Adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Pesticide usage
- E. None of the Above

154. Killing mosquito larvae before they emerge as adults can reduce or \_\_\_\_\_ the need for ground or aerial application of pesticides to kill adult mosquitoes.

- A. Biological insecticides
- B. Adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Eliminate
- E. None of the Above

What are Microbial Larvicides?

155. \_\_\_\_\_ are bacteria that are registered as pesticides for control of mosquito larvae in outdoor areas such as irrigation ditches, flood water, standing ponds, woodland pools, pastures, tidal water, fresh or saltwater marshes, and storm water retention areas.

- A. Microbial larvicides
- B. Mosquito species
- C. *Bacillus thuringiensis israelensis* (Bti)
- D. Naturally occurring soil bacterium
- E. None of the Above

156. Duration of effectiveness depends primarily on the \_\_\_\_\_, the environmental conditions, the formulation of the product, and water quality.

- A. Microbial larvicides
- B. Mosquito species
- C. *Bacillus thuringiensis israelensis* (Bti)
- D. Naturally occurring soil bacterium

157. \_\_\_\_\_ may be used along with other mosquito control measures in an IPM program.

- A. Microbial larvicides
- B. Mosquito species
- C. *Bacillus thuringiensis israelensis* (Bti)
- D. Naturally occurring soil bacterium
- E. None of the Above

158. The microbial larvicides used for mosquito control are \_\_\_\_\_ and *Bacillus sphaericus* (*B. sphaericus*).
- Microbial larvicides
  - Mosquito species
  - Bacillus thuringiensis israelensis* (Bti)
  - Naturally occurring soil bacterium
  - None of the Above
159. *Bacillus thuringiensis israelensis* is a \_\_\_\_\_ registered for control of mosquito larvae. Bti was first registered by the EPA as an insecticide in 1983.
- Microbial larvicides
  - Mosquito species
  - Bacillus thuringiensis israelensis* (Bti)
  - Naturally occurring soil bacterium
  - None of the Above
160. Mosquito larvae eat the \_\_\_\_\_ product that is made up of the dormant spore form of the bacterium and an associated pure toxin.
- Microbial larvicides
  - Mosquito species
  - Bacillus thuringiensis israelensis* (Bti)
  - Naturally occurring soil bacterium
  - None of the Above
161. The toxin disrupts the gut in the mosquito by binding to receptor cells present in insects, but not in \_\_\_\_\_.
- Mammals
  - Mosquito species
  - Bacillus thuringiensis israelensis* (Bti)
  - Naturally occurring soil bacterium
  - None of the Above
162. There are \_\_\_\_\_ for use in the United States. Aquabac, Teknar, Vectobac, and LarvX are examples of common trade names for the mosquito control products.
- EPA as an insecticide in 1983
  - 26 Bti products registered
  - Registered by the EPA in 1991
  - One to four weeks
  - None of the Above
163. *Bacillus sphaericus* is a naturally occurring bacterium that is found throughout the world. *B. sphaericus* was initially \_\_\_\_\_ for use against various kinds of mosquito larvae.
- EPA as an insecticide in 1983
  - 26 Bti products registered
  - Registered by the EPA in 1991
  - One to four weeks
  - None of the Above

164. VectoLex CG and WDG are registered B. sphaericus products and are effective for approximately \_\_\_\_\_ after application.

- A. EPA as an insecticide in 1983
- B. 26 Bti products registered
- C. Registered by the EPA in 1991
- D. One to four weeks
- E. None of the Above

165. The microbial pesticides have undergone extensive testing prior to registration. They are essentially \_\_\_\_\_, so there are no concerns for human health effects with Bti or B. sphaericus when they are used according to label directions.

- A. Nontoxic to humans
- B. Pose risks to wildlife
- C. Do not pose risks
- D. Risks to human health
- E. None of the Above

Do Microbial Larvicides Pose Risks to Wildlife or the Environment?

166. Extensive testing shows that microbial larvicides \_\_\_\_\_, nontarget species, or the environment, when used according to label directions.

- A. Nontoxic to humans
- B. Pose risks to wildlife
- C. Do not pose risks to wildlife
- D. Risks to human health
- E. None of the Above

What is Methoprene?

167. Methoprene is a compound first \_\_\_\_\_ that mimics the action of an insect growth-regulating hormone and prevents the normal maturation of insect larvae.

- A. EPA as an insecticide in 1983
- B. 26 Bti products registered
- C. Registered by the EPA in 1975
- D. One to four weeks
- E. None of the Above

168. It is \_\_\_\_\_ to kill mosquito larvae, and it may be used along with other mosquito control measures in an IPM program.

- A. Solids
- B. Sand granules
- C. Applied to water
- D. Liquid and pelletized formulations
- E. None of the Above

169. Altosid is the name of the methoprene product used in mosquito control and is applied as briquettes (similar in form to charcoal briquettes), pellets, \_\_\_\_\_, and liquids.

- A. Solids
- B. Sand granules
- C. Applied to water
- D. Crystals
- E. None of the Above

170. The \_\_\_\_\_ can be applied by helicopter and fixed-wing aircraft.
- A. Solids
  - B. Sand granules
  - C. Applied to water
  - D. Liquid and pelletized formulations
  - E. None of the Above

Does Methoprene Pose Risks to Human Health?

171. Methoprene, used for mosquito control according to its label directions, \_\_\_\_\_ to human health. In addition to posing low toxicity to mammals, there is little opportunity for human exposure, since the material is applied directly to ditches, ponds, marshes, or flooded areas that are not drinking water sources.

- A. Nontoxic to humans
- B. Pose risks to wildlife
- C. Do not pose unreasonable risks
- D. Risks to human health
- E. None of the Above

172. Does Methoprene Pose Risks to Wildlife or the Environment?

Methoprene used in mosquito control programs does \_\_\_\_\_ or the environment.

- A. Nontoxic to humans
- B. Pose risks to wildlife
- C. Not pose unreasonable risks to wildlife
- D. Risks to human health
- E. None of the Above

173. Toxicity of methoprene to birds and fish is low, and it is \_\_\_\_\_.

- A. Nontoxic to humans
- B. Pose risks to wildlife
- C. Do not pose risks
- D. Nontoxic to bees
- E. None of the Above

174. Methoprene breaks down quickly in water and soil and \_\_\_\_\_ into ground water.

- A. Will not leach
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to human health
- E. None of the Above

175. Methoprene mosquito control products present \_\_\_\_\_ risk to freshwater fish, freshwater invertebrates, and estuarine species.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to human health
- E. None of the Above



176. Temephos is an organophosphate (OP) pesticide \_\_\_\_\_ to control mosquito larvae, and it is the only organophosphate with larvicidal use.
- A. EPA as an insecticide in 1983
  - B. 26 Bti products registered
  - C. Registered by the EPA in 1991
  - D. Registered by the EPA in 1965
  - E. None of the Above
177. It is an important \_\_\_\_\_ for mosquito control programs; its use helps prevent mosquitoes from developing resistance to the bacterial larvicides.
- A. Insecticide
  - B. To kill mosquitoes
  - C. Kill adult mosquitoes
  - D. Resistance management tool
  - E. None of the Above
178. Temephos is used in areas of \_\_\_\_\_, shallow ponds, swamps, marshes, and intertidal zones. It may be used along with other mosquito control measures in an IPM program.
- A. Running waters
  - B. Standing water
  - C. Stream breeders
  - D. Along banks
  - E. None of the Above
179. Abate is the trade name of the \_\_\_\_\_ used for mosquito control.
- A. Golden Bear 1111
  - B. Oils
  - C. Temephos product
  - D. Chlordane
  - E. None of the Above
180. Temephos is applied most commonly by \_\_\_\_\_, but can be applied by backpack sprayers, fixed-wing aircraft, and right-of-way sprayers in either liquid or granular form.
- A. Aerosol bombs
  - B. Hand-carried dispersal units
  - C. Helicopter
  - D. Aerosol foggers
  - E. None of the Above
181. It is \_\_\_\_\_, and the amount of temephos is very small in relation to the area covered, less than 1 ounce of active ingredient per acre for the liquid and 8 ounces per acre for the granular formulations.
- A. Holes and containers
  - B. Annoying and potentially dangerous
  - C. Unique behaviors and bite
  - D. Applied to water
  - E. None of the Above

Does Temephos Pose Risks to Human Health?

182. Temephos, applied according to the label for mosquito control, \_\_\_\_\_ to human health.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not unreasonable pose risks
- D. None of the Above

183. Current mosquito larviciding techniques pose \_\_\_\_\_ aquatic species and the aquatic ecosystem.

- A. Nontoxic
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Some risk to nontarget
- E. None of the Above

184. Although temephos presents \_\_\_\_\_ to birds and terrestrial species, available information suggests that it is more toxic to aquatic invertebrates than alternative larvicides.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Relatively low risk
- E. None of the Above

185. For this reason, the EPA is limiting temephos use to areas where \_\_\_\_\_ would not be effective, specifying intervals between applications, and limiting the use of high application rates.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Less-hazardous alternatives
- E. None of the Above

186. Temephos \_\_\_\_\_, and post-application exposure is minimal.

- A. Breaks down within a few days in water
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Toxin disrupts the lining of the larvae's intestine
- E. None of the Above

187. Does Temephos Pose Risks to Wildlife or the Environment?

Because temephos is applied directly to water, it is not \_\_\_\_\_ on terrestrial animals or birds.

- A. Breaks down within a few days in water
- B. Expected to have a direct impact
- C. 150 days of uninterrupted mosquito control
- D. Toxin disrupts the lining of the larvae's intestine
- E. None of the Above

Monomolecular Films?

188. Monomolecular films are low-toxicity pesticides that spread a thin film on the surface of the water that makes it difficult for mosquito \_\_\_\_\_, pupae, and emerging adults to attach to the water's surface, causing them to drown.

- A. Insecticide
- B. Deet
- C. Kill adult mosquitoes
- D. Larvae
- E. None of the Above

189. Films may remain active typically for \_\_\_\_\_ on standing water, and have been used in the United States in floodwaters, brackish waters, and ponds.

- A. One day
- B. 10-14 days
- C. One year
- D. One to four weeks
- E. None of the Above

190. They may be used along with other mosquito control measures in an IPM program. They are also known under the trade names \_\_\_\_\_ and Agnique MMF.

- A. Golden Bear 1111
- B. Arosurf MSF
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

Do Monomolecular Films Pose Risks to Human Health?

191. Monomolecular films, used according to label directions for larva and pupa control, \_\_\_\_\_.

- A. Toxic to humans
- B. Minimal acute and chronic
- C. Do not pose risks to human health
- D. Risks to human health
- E. None of the Above

192. In addition to low toxicity, there is \_\_\_\_\_, since the material is applied directly to ditches, ponds, marshes, or flooded areas that are not drinking water sources.

- A. Little opportunity for human exposure
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to human health
- E. None of the Above

Do Films Pose Risks to Wildlife or the Environment?

193. Monomolecular films, used according to label directions for larva and pupa control, \_\_\_\_\_ to the environment.

- A. Nontoxic
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Pose minimal risks
- E. None of the Above

194. They do not last very long in the environment, and are usually applied only to standing water, such as \_\_\_\_\_, woodland pools, or containers that contain few nontarget organisms.

- A. Running waters
- B. On ponds
- C. Stream breeders
- D. Roadside ditches
- E. None of the Above

What are Oils?

195. \_\_\_\_\_, like films, are pesticides used to form a coating on top of water to drown larvae, pupae, and emerging adult mosquitoes.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

196. They are specially derived from petroleum distillates and have been used for many years in the United States to \_\_\_\_\_ on crops and orchard trees, and to control mosquitoes. They may be used along with other mosquito control measures in an IPM program.

- A. Insecticide
- B. To kill mosquitoes
- C. Kill aphids
- D. Larva
- E. None of the Above

197. Trade names for oils used in mosquito control are Bonide, BVA2, and \_\_\_\_\_.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

Do Oils Pose Risks to Human Health?

198. Oils, used according to label directions for larva and pupa control, \_\_\_\_\_ to human health.

- A. Nontoxic
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks
- E. None of the Above

199. In addition to \_\_\_\_\_, there is little opportunity for human exposure, since the material is applied directly to ditches, ponds, marshes, or flooded areas that are not drinking water sources.

- A. Low toxicity
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to human health
- E. None of the Above

Do Oils Pose Risks to Wildlife or the Environment?

200. Oils, if misapplied, \_\_\_\_\_ and other aquatic organisms. For that reason, the EPA has established specific precautions on the label to reduce such risks.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. May be toxic to fish
- D. Risks to human health
- E. None of the Above

Naled For Mosquito Control

201. Officials responsible for mosquito control programs make decisions to use pesticides based on an evaluation of the \_\_\_\_\_ from diseases transmitted by mosquitoes or on an evaluation of the nuisance level that communities can tolerate from a mosquito infestation.

- A. Risk of low toxicity
- B. Risk of acute and chronic
- C. Risks to the general public
- D. Risks to animals
- E. None of the Above

202. Based on surveillance and monitoring, mosquito control officials select specific pesticides and other control measures that best suit local conditions in order to achieve effective control of mosquitoes with the \_\_\_\_\_ and the environment.

- A. Nontoxic to humans
- B. Least impact on human health
- C. Do not pose risks
- D. Risks to human health
- E. None of the Above

203. It is especially important to conduct effective mosquito prevention programs by eliminating \_\_\_\_\_ or applying pesticides to control the early life stages of the mosquito.

- A. Insecticide
- B. To kill mosquitoes
- C. Breeding habitats
- D. Larvae
- E. None of the Above

204. Prevention programs, such as elimination of any standing water that could serve as a breeding site, help \_\_\_\_\_ mosquito population and the need to apply other pesticides for adult mosquito control.

- A. Insecticide
- B. To kill mosquitoes
- C. Reduce adult mosquito
- D. Larvae
- E. None of the Above

What is Naled?

205. Naled is an organophosphate (OP) insecticide that has been \_\_\_\_\_ for use in the United States.

- A. EPA as an insecticide in 1983
- B. 26 Bti products registered
- C. Registered by the EPA in 1975
- D. Registered since 1959
- E. None of the Above

206. When applied in accordance with the rate of application and the safety precautions specified on the label, Naled can be used to kill mosquitoes without posing unreasonable \_\_\_\_\_ or the environment.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to human health
- E. None of the Above

How is Naled Used in Mosquito Control?

207. Naled is an adulticide used to \_\_\_\_\_. In mosquito control programs conducted by state or local authorities, Naled is applied by truck-mounted or aircraft-mounted sprayers.

- A. Insecticide
- B. To kill mosquitoes
- C. Kill adult mosquitoes
- D. Larva
- E. None of the Above

208. Naled is applied as an Ultra-low volume (ULV) spray. \_\_\_\_\_ sprayers dispense very fine aerosol droplets that stay aloft and kill mosquitoes on contact.

- A. Golden Bear 1111
- B. Oils
- C. Ultra-low volume (ULV)
- D. Chlordane
- E. None of the Above

209. For mosquito control, Naled is applied at a maximum rate of \_\_\_\_\_ of active ingredient per acre for aerial application and 0.1 pounds (0.33 ounce) per acre for ground application, which minimizes exposure and risks to people and the environment.

- A. 100 to 500
- B. 3 to 4 broods
- C. In water
- D. 0.05 pounds (0.8 ounce)
- E. None of the Above

Does Naled Pose Risks to Human Health?

210. Naled can be used for public health mosquito control programs without posing unreasonable \_\_\_\_\_ when applied according to the label.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to the general population
- E. None of the Above

211. The EPA has estimated the exposure and \_\_\_\_\_ posed by ULV aerial and ground applications of Naled.

- A. Nontoxic to humans
- B. Risks to both adults and children
- C. Do not pose risks
- D. Minimal acute and chronic
- E. None of the Above

212. Because of the very small amount of active ingredient released per acre of ground, the estimates found that for all scenarios considered, exposures were hundreds or even thousands of times below an amount that \_\_\_\_\_.

- A. Nontoxic to humans
- B. Risks to both adults and children
- C. Might pose a health concern
- D. Minimal acute and chronic
- E. None of the Above

213. These estimates assumed several spraying events over a period of weeks, and also assumed that a toddler would ingest some soil and grass in addition to skin and \_\_\_\_\_.

- A. Nausea
- B. Dizziness
- C. Do not pose risks
- D. Inhalation exposure
- E. None of the Above

214. Naled like other organophosphates, can over stimulate the nervous system causing \_\_\_\_\_, dizziness, or confusion.

- A. Nausea
- B. Convulsions
- C. Do not pose risks
- D. Minimal acute and chronic
- E. None of the Above

215. Severe high-dose poisoning with any organophosphate can cause convulsions, respiratory paralysis, and \_\_\_\_\_.

- A. Nausea
- B. Dizziness
- C. Do not pose risks
- D. Death
- E. None of the Above

216. Does Naled Pose Risks to Wildlife or the Environment?

Naled used in mosquito control programs does not pose unreasonable \_\_\_\_\_ or the environment.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Risks to wildlife
- D. Risks to human health
- E. None of the Above

217. Naled degrades rapidly in the environment, and it displays \_\_\_\_\_ to birds and mammals.

- A. Nontoxic
- B. Low toxicity
- C. Do not pose risks
- D. Extreme risks
- E. None of the Above

218. \_\_\_\_\_ risk to fish is not expected, but there is potential for risks to invertebrates from the repeated use of Naled.

- A. Toxic
- B. Acute and chronic
- C. Do not pose risks
- D. High risks
- E. None of the Above

219. Naled is \_\_\_\_\_ to insects, including beneficial insects such as honeybees. For that reason, the EPA has established specific precautions on the label to reduce such risk.

- A. Nontoxic
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Highly toxic
- E. None of the Above

What are Synthetic Pyrethroids?

220. Pyrethroids are synthetic chemical insecticides that act in a similar manner to \_\_\_\_\_, which are derived from chrysanthemum flowers.

- A. Golden Bear 1111
- B. Pyrethrins
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

221. Pyrethroids are widely used for controlling various insects. Permethrin, \_\_\_\_\_, and sumithrin are synthetic pyrethroids commonly used in mosquito control programs to kill adult mosquitoes.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Resmethrin
- E. None of the Above

222. Permethrin has been \_\_\_\_\_. It is currently registered and sold in a number of products such as household insect foggers and sprays, tick and flea sprays for yards, flea dips and sprays for cats and dogs, termite treatments, agricultural and livestock products, and mosquito abatement products.

- A. EPA as an insecticide in 1983
- B. Registered by the EPA since 1977
- C. Registered by the EPA in 1975
- D. Registered by the EPA since 1998
- E. None of the Above

223. Resmethrin has been \_\_\_\_\_ and is used to control flying and crawling insects in the home, lawn, garden, and industrial sites. It can also be used to control insects on ornamental plants (outdoor and greenhouse use), on pets and horses, and as a mosquitocide.

- A. EPA as an insecticide in 1983
- B. Registered by the EPA since 1977
- C. Registered by the EPA in 1975
- D. Registered by the EPA since 1971
- E. None of the Above



224. Sumithrin has been \_\_\_\_\_ and is used to control adult mosquitoes and as an insecticide in transport vehicles such as aircraft, ships, railroad cars, and truck trailers.

- A. EPA as an insecticide in 1983
- B. Registered by the EPA since 1977
- C. Registered by the EPA in 1975
- D. Registered by the EPA since 1971
- E. None of the Above

#### Synthetic Pyrethroids Used in Adult Mosquito Control

225. Most \_\_\_\_\_ control products can be applied only by public health officials and trained personnel of mosquito control districts.

- A. Aerosol bombs
- B. Hand-carried dispersal units
- C. ULV spraying
- D. Aerosol foggers
- E. None of the Above

226. Mosquito control professionals apply pyrethroids as an \_\_\_\_\_ spray. Ultra-low volume (ULV) sprayers dispense very fine aerosol droplets that stay aloft and kill adult mosquitoes on contact.

- A. Golden Bear 1111
- B. Oils
- C. Ultra-low volume (ULV)
- D. Chlordane
- E. None of the Above

227. Pyrethroids used in mosquito control are typically mixed with a synergist compound, such as \_\_\_\_\_, which enhances the effectiveness of the active ingredient.

- A. Golden Bear 1111
- B. Piperonyl butoxide
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

228. The product is often diluted in water or oil and applied at rates \_\_\_\_\_ of a pound of active ingredient or less than 4 fluid ounces of mixed formulation per acre.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. In water
- D. Less than 1/100th
- E. None of the Above

#### Do Pyrethroids Pose Risks to Human Health?

229. Pyrethroids can be used for public health mosquito control programs without posing unreasonable \_\_\_\_\_ when applied according to the label.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to human health
- E. None of the Above

230. Pyrethroids are considered to pose \_\_\_\_\_ to humans, but at high doses, pyrethroids can affect the nervous system.

- A. Nontoxic
- B. Minimal acute and chronic
- C. Slight risks of acute toxicity
- D. Risks
- E. None of the Above

Do Pyrethroids Pose Risks to Wildlife or the Environment?

231. Pyrethroids used in mosquito control programs \_\_\_\_\_ risks to wildlife or the environment.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not pose unreasonable
- D. Risks to human health
- E. None of the Above

232. Pyrethroids, when applied at mosquito control rates, are low in toxicity to mammals, and are practically \_\_\_\_\_ to birds.

- A. Nontoxic
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to
- E. None of the Above

233. Mosquito control formulations of permethrin break down in the environment, and \_\_\_\_\_ and sunlight accelerate this process.

- A. Running waters
- B. High temperatures
- C. Stream breeders
- D. Cold weather
- E. None of the Above

234. Pyrethroids are \_\_\_\_\_ to fish and to bees. For this reason, the EPA has established specific precautions on the label to reduce such risks, including restrictions that prohibit the direct application of products to open water or within 100 feet of lakes, streams, rivers, or bays.

- A. Nontoxic
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Toxic
- E. None of the Above

*Anopheles* spp.

Of the insects that serve as vectors for parasitic diseases, this genus is arguably the most important.

235. Of the approximately \_\_\_\_\_ of *Anopheles*, about two dozen serve as vectors for malaria (*Plasmodium* spp.) in humans.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. 422 species
- D. 300
- E. None of the Above

236. About \_\_\_\_\_ of the protozoan Plasmodium that causes malaria, but only about 40 are important.

- A. 100 to 500 larvae
- B. 70 are vectors
- C. All are virus
- D. 1 of 2
- E. None of the Above

237. Malaria infects \_\_\_\_\_ people and kills 1.5-2.7 million people each year, making it by far the most serious of the diseases spread by insects.

- A. 100 to 500
- B. 300-500 million
- C. 1 of two
- D. 5 billion
- E. None of the Above

238. Culex pipiens, the \_\_\_\_\_ has a distribution that roughly includes the northern half of the United States.

- A. Culex quinquefasciatus
- B. Culex pipiens
- C. Culex restuans
- D. Hibernating females
- E. None of the Above

239. The species is replaced by \_\_\_\_\_, the Southern House Mosquito, in the southern United States with limited overlap in portions of the Midwest.

- A. Culex quinquefasciatus
- B. Culex pipiens
- C. Culex restuans
- D. Hibernating females
- E. None of the Above

240. \_\_\_\_\_ provides the life cycle model for most of the domestic Culex in temperate areas.

- A. Culex quinquefasciatus
- B. Culex pipiens
- C. Culex restuans
- D. Hibernating females
- E. None of the Above

241. The \_\_\_\_\_ pass the winter in diapause and do not become active during periods of warm winter weather.

- A. Culex quinquefasciatus
- B. Culex pipiens
- C. Culex restuans
- D. Females
- E. None of the Above

242. \_\_\_\_\_ are common in basements, outbuildings, and subterranean enclosures.
- A. *Culex quinquefasciatus*
  - B. *Culex pipiens*
  - C. *Culex restuans*
  - D. Hibernating females
  - E. None of the Above
243. Like \_\_\_\_\_, the females congregate near moisture and move their resting location during the winter to remain in a humid atmosphere.
- A. *Culex quinquefasciatus*
  - B. *Culex pipiens*
  - C. *Culex restuans*
  - D. Hibernating females
  - E. None of the Above
244. Mortality can be extensive during periods of \_\_\_\_\_.
- A. *Culex quinquefasciatus*
  - B. *Culex pipiens*
  - C. *Culex restuans*
  - D. Winter drought
  - E. None of the Above
245. \_\_\_\_\_ emerge from hibernation during May and begin depositing egg rafts in suitable habitat.
- A. *Culex quinquefasciatus*
  - B. *Culex pipiens*
  - C. *Culex restuans*
  - D. Females
  - E. None of the Above
246. Populations of this mosquito usually peak during August, but \_\_\_\_\_ well into September.
- A. *Culex quinquefasciatus*
  - B. *Culex pipiens*
  - C. *Culex restuans*
  - D. Hibernating females
  - E. None of the Above
247. The adults from the \_\_\_\_\_ of the season lose all interest in blood meal hosts but will move in and out of overwintering sites during periods of mild fall weather.
- A. Last generation
  - B. Breeding habitats
  - C. Temporary ground water
  - D. Deposits its eggs
  - E. None of the Above
248. Larvae rarely persist in \_\_\_\_\_ after females have entered hibernation.
- A. Last generation
  - B. Breeding habitats
  - C. Temporary ground water
  - D. Deposits its eggs
  - E. None of the Above

249. \_\_\_\_\_ can be found in a fairly wide range of larval habitats, but are generally associated with water that has a high organic content.
- A. *Culex quinquefasciatus*
  - B. *Culex pipiens*
  - C. *Culex restuans*
  - D. Hibernating females
  - E. None of the Above
250. The species utilizes \_\_\_\_\_ that ranges from mildly to grossly polluted.
- A. Last generation
  - B. Breeding habitats
  - C. Temporary ground water
  - D. Deposits its eggs
  - E. None of the Above
251. The species also \_\_\_\_\_ in artificial containers, including tin cans, tires, and any refuse that allows stagnant water to puddle.
- A. Last generation
  - B. Breeding habitats
  - C. Temporary ground water
  - D. Deposits its eggs
  - E. None of the Above
252. The species is decidedly urban and reaches greatest numbers in large urban centers. Catch basins and storm drains provide ideal habitat for \_\_\_\_\_.
- A. *Culex quinquefasciatus*
  - B. *Cx. pipiens*
  - C. *Culex restuans*
  - D. Hibernating females
  - E. None of the Above
253. The species becomes particularly abundant in areas where raw sewage leaks into subterranean drainage systems. \_\_\_\_\_ and slaughter house drainage ponds support high populations of this species.
- A. Meat packing plants
  - B. Eastern seaboard
  - C. Gulf Coast region
  - D. Sumps on farms
  - E. None of the Above
254. \_\_\_\_\_ can always be collected in the effluent from sewage treatment plants.
- A. *Culex quinquefasciatus*
  - B. *Culex pipiens*
  - C. *Culex restuans*
  - D. Hibernating females
  - E. None of the Above

Collection

255. No special techniques are required to collect \_\_\_\_\_ larvae. This species is common in urban settings and can usually be found in significant numbers in a variety of habitats where stagnant water collects.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

256. \_\_\_\_\_ will oviposit readily in buckets containing prepared straw infusions. Most piles of discarded tires contain a mixture of *Cx. pipiens* and *Cx. restuans* in addition to the tire-breeding *Aedes*.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

257. \_\_\_\_\_ occurs on every continent except Antarctica and is the most widely distributed mosquito in the world.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

258. In North America, two races range north (*Cx. pipiens pipiens*) and south (*Cx. pipiens quinquefasciatus*) of 39°N latitude, about the level of Sacramento. *Cx. p. pipiens* lives in the milder coastal climate areas, while *Cx. p. quinquefasciatus* is found in the \_\_\_\_\_.

- A. Meat packing plants
- B. Eastern seaboard
- C. Warmer inland valleys
- D. Sumps on farms
- E. None of the Above

259. \_\_\_\_\_ main host is wild birds, but it also feeds freely on a wide variety of warm-blooded vertebrates, including man.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

260. In northern California, it currently plays only a lesser role as a carrier of human disease, while in southern California and the \_\_\_\_\_, it is a major carrier of Saint Louis encephalitis.

- A. Meat packing plants
- B. Eastern seaboard
- C. Gulf Coast region
- D. Sumps on farms
- E. None of the Above

261. It is also the best known carrier of West Nile Virus, a severe encephalitis virus newly arrived in the Americas that is spreading along the \_\_\_\_\_.

- A. Meat packing plants
- B. Eastern seaboard
- C. Gulf Coast region
- D. Sumps on farms
- E. None of the Above

262. \_\_\_\_\_ is a serious pest, called the "house mosquito" because it commonly develops in small containers around the home.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

263. It shows great skill in finding ways to get into the house, where it feeds on the occupants at night. It also occurs in containers and \_\_\_\_\_ and industrial plants, in polluted waters, and will feed out-of-doors at night.

- A. Meat packing plants
- B. Eastern seaboard
- C. Gulf Coast region
- D. Sumps on farms
- E. None of the Above

264. \_\_\_\_\_ larvae typically develop best in dirty, stagnant water containing abundant organic matter, in ground pools and natural and man-made containers.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

265. Vector technicians often find improperly installed or maintained \_\_\_\_\_ producing huge numbers of this species.

- A. Meat packing plants
- B. Eastern seaboard
- C. Gulf Coast region
- D. Underground septic tanks
- E. None of the Above

266. The mosquitoes gain entrance through \_\_\_\_\_, through poorly fitting or unsealed covers, or by the vent pipes made for removal of gases.

- A. Meat packing plants
- B. Eastern seaboard
- C. Cracks in the ground
- D. Sumps on farms
- E. None of the Above

267. Most larval samples from \_\_\_\_\_ consist mainly of Cx. pipiens and Cx restuans. Culex pipiens larvae are easily distinguished from Cx. restuans by the length and shape of the antennae.

- A. Meat packing plants
- B. Eastern seaboard
- C. Polluted water sources
- D. Sumps on farms
- E. None of the Above

Where does this Mosquito normally lay its Eggs?

268. In tin cans, buckets, discarded tires and other artificial containers that \_\_\_\_\_.

- A. Discerned with practice
- B. Hold stagnant water
- C. Build body fat
- D. State of torpor
- E. None of the Above

269. In untended bird baths, clogged rain gutters and plastic wading pools that \_\_\_\_\_.

- A. Discerned with practice
- B. Hold stagnant water
- C. Build body fat
- D. State of torpor
- E. None of the Above

270. In \_\_\_\_\_ and catch basins in urban areas.

- A. Discerned with practice
- B. Hold stagnant water
- C. Catch basins
- D. State of torpor
- E. None of the Above

271. In septic seepage and other foul water sources above or \_\_\_\_\_.

- A. Below ground level
- B. Hold stagnant water
- C. Build body fat
- D. State of torpor
- E. None of the Above

How does this Mosquito Overwinter?

272. The last generation of adult females mate and \_\_\_\_\_ by feeding on carbohydrates.

- A. Discerned with practice
- B. Hold stagnant water
- C. Build body fat
- D. State of torpor
- E. None of the Above



273. Mated females \_\_\_\_\_ in culverts, basements, and protected areas that stay above freezing.

- A. Discerned with practice
- B. Hold stagnant water
- C. Build body fat
- D. Find refuge
- E. None of the Above

274. The body metabolism slows considerably and winter is spent in a \_\_\_\_\_.

- A. Discerned with practice
- B. Hold stagnant water
- C. Build body fat
- D. State of torpor
- E. None of the Above

275. Females that survive the winter blood feed in spring and lay eggs that \_\_\_\_\_ populations.

- A. Discerned with practice
- B. Produce the summer
- C. Build body fat
- D. State of torpor
- E. None of the Above

#### Antennal Shape

276. The characteristic antennal shape is difficult to see in the dipper, but the slightly longer, constricted antennae and \_\_\_\_\_ can be discerned with practice.

- A. Discerned with practice
- B. Hold stagnant water
- C. Build body fat
- D. Prominent antennal tufts
- E. None of the Above

277. The \_\_\_\_\_ on the siphon can be used as a diagnostic character under the microscope.

- A. Discerned with practice
- B. Multiple hair tufts
- C. Build body fat
- D. State of torpor
- E. None of the Above

278. *Culex salinarius* is a closely related species that is easily distinguished by the longer, \_\_\_\_\_.

- A. Discerned with practice
- B. More slender siphon
- C. Build body fat
- D. State of torpor
- E. None of the Above

279. SLE is a natural \_\_\_\_\_ found in a variety of wild birds.

- A. Infection
- B. SLE
- C. Indicator of polluted water
- D. Primary vector
- E. None of the Above

280. Culex pipiens can function as a \_\_\_\_\_ and pass the virus from one bird to the next.

- A. Infection
- B. SLE
- C. Indicator of polluted water
- D. Vector
- E. None of the Above

281. If virus is introduced to an urban setting, Culex pipiens can amplify the \_\_\_\_\_ in urban birds.

- A. Infection
- B. SLE
- C. Indicator of polluted water
- D. Primary vector
- E. None of the Above

282. House Sparrows, an introduced species, circulate exceptionally high levels of \_\_\_\_\_ when they become infected.

- A. Infection
- B. SLE
- C. Indicator of polluted water
- D. Primary vector
- E. None of the Above

283. Culex pipiens that bite infected birds acquire the \_\_\_\_\_ and are capable of passing it on to humans.

- A. Infection
- B. SLE
- C. Virus
- D. Primary vector
- E. None of the Above

284. Summary \_\_\_\_\_ is usually the most common pest mosquito in urban and suburban settings.

- A. Infection
- B. SLE
- C. Culex pipiens
- D. Primary vector
- E. None of the Above

285. \_\_\_\_\_ is an indicator of polluted water in the immediate vicinity.

- A. Infection
- B. SLE
- C. Culex pipiens
- D. Primary vector
- E. None of the Above

286. Culex pipiens is recognized as the primary vector of \_\_\_\_\_.

- A. Infection
- B. SLE
- C. Culex pipiens
- D. Primary vector
- E. None of the Above

287. \_\_\_\_\_ is normally considered to be a bird feeder.

- A. Infection
- B. SLE
- C. *Culex pipiens*
- D. Primary vector
- E. None of the Above

288. Some \_\_\_\_\_ have a predilection for mammalian hosts and feed readily on humans.

- A. Infection
- B. SLE
- C. Urban strains
- D. Primary vector
- E. None of the Above

289. Most populations probably contain individuals that \_\_\_\_\_ from mammals as well as birds.

- A. Infection
- B. SLE
- C. Accept blood
- D. Primary vector
- E. None of the Above

Pale Marsh Mosquito *Ochlerotatus dorsalis*

290. *Ochlerotatus dorsalis*' common name comes from its whitish-grey appearance: the abdomen and wings have intermixed narrow light and dark scales. Sometimes the \_\_\_\_\_.

- A. Light scales predominate
- B. Seasonally flooded
- C. Last adults emerging
- D. Brackish marshes
- E. None of the Above

291. In California, it occurs along the Pacific coast and in the eastern regions of the state. It breeds along the edges of bays, \_\_\_\_\_. It is especially frequent in the seasonally flooded marshes along the edges of the San Francisco and San Pablo Bays.

- A. Light scales predominate
- B. Seasonally flooded
- C. Last adults emerging
- D. Marshes and lakes
- E. None of the Above

292. A strong flyer, *Ochlerotatus dorsalis* often disperses \_\_\_\_\_ or more from its breeding sources. Unlike most other local *Ochlerotatus*, the pale marsh mosquito is active almost year-around.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. In water
- D. 20 miles
- E. None of the Above

293. Females produce continuous broods throughout the spring and summer, with 8 to 12 hatches each year, and the \_\_\_\_\_ in October.

- A. Light scales predominate
- B. Seasonally flooded
- C. Last adults emerging
- D. Brackish marshes
- E. None of the Above

294. Pre-adult stages can be as short as \_\_\_\_\_ in the warm summer weather.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. In water
- D. 1 to 2 weeks
- E. None of the Above

295. Populations sometimes build up to huge numbers in \_\_\_\_\_ subject to prolonged spring flooding.

- A. Light scales predominate
- B. Seasonally flooded
- C. Last adults emerging
- D. Brackish marshes
- E. None of the Above

296. *Ochlerotatus dorsalis* is a serious pest mosquito and a \_\_\_\_\_ of the encephalitis virus. Females prefer to feed on large mammals like cattle and horses (and man) when these are available.

- A. Light scales predominate
- B. Seasonally flooded
- C. Secondary vector
- D. Brackish marshes
- E. None of the Above

297. They are \_\_\_\_\_, and so aggressive and persistent that livestock tend to move away from areas where they are numerous.

- A. Highest malaria infection rates
- B. Malaria vector
- C. Vicious biters
- D. Bite man aggressively
- E. None of the Above

Western Malaria Mosquito *Anopheles freeborni*

298. *Anopheles freeborni* is the most important \_\_\_\_\_ in California. In our lifetime, endemic malaria has been eradicated from the U.S. But in our grandparents' time, it was so serious that education guidelines called for it to be included in the instructional program in every primary school.

- A. Highest malaria infection rates
- B. Malaria vector
- C. Active infections
- D. Bite man aggressively
- E. None of the Above

299. Today, carrier mosquitoes still occur throughout the state, and hundreds of \_\_\_\_\_ are discovered every year in tourists and immigrants from other countries.

- A. Highest malaria infection rates
- B. Malaria vector
- C. Active infections
- D. Bite man aggressively
- E. None of the Above

300. Anopheles are \_\_\_\_\_ from other mosquitoes: their eggs are laid individually and have small floats on each side; the larvae lack the long breathing tube found in other mosquitoes; adults have hairs, but no scales on the abdomen and both sexes have palpi as long as the proboscis.

- A. Highest malaria infection rates
- B. Malaria vector
- C. Active infections
- D. Easily distinguished
- E. None of the Above

**You are finished with your assignment. Please fax, mail or e-mail your assignment along with your registration form and survey sheet. Always call later to ensure we've received the assignment.**

**Fax (928) 272-0747 e-mail [info@tlch2o.com](mailto:info@tlch2o.com)**



## Mosquito Control CEU Training Awareness Assignment #3 Last Names L to P

You will have 90 days from the start of this course to have successfully passed this assignment with a score of 70 %. You may e mail the answers to TLC, info@tlch2o.com or fax the answers to TLC, (928) 272-0747. This assignment is available to you in a Word Format on TLC's Website. You can find online assistance for this course on the in the Search function on Adobe Acrobat PDF to help find the answers. Once you have paid the course fee, you will be provided complete course support from Student Services (928) 468-0665.

Assignment #1 for all pest applicators whose names start with the letter A- E.

Assignment #2 for all pest applicators whose last names start with F-K.

Assignment #3 for all pest applicators whose last name starts with the letter L-P.

Assignment #4 for all pest applicators whose last name starts with the letter Q-R.

Assignment #5 for all pest applicators whose last name starts with the letter S-Z.

### **Multiple Choice Section, One answer per question and please use the answer key.**

#### Mosquito Introduction

1. About 3,000 species of mosquitoes \_\_\_\_\_ on a world-wide basis. Approximately 150-200 are known to occur in North America.

- A. Lay their eggs
- B. May produce
- C. Have been described
- D. Will only emerge
- E. None of the Above

2. Scientists group species by genus on the basis of the physical characteristics they share. The 3,000 mosquito species found in the world are \_\_\_\_\_ 28 different genera.

- A. Lay their eggs
- B. May produce
- C. Divided among
- D. Will only emerge
- E. None of the Above

3. The genus Aedes contains some of the worst pests. Many members of the genus Anopheles have the \_\_\_\_\_ human malaria.

- A. Lay their eggs
- B. May produce
- C. Ability to transmit
- D. Will only emerge
- E. None of the Above

*Aedes vexans*

4. Floodwater mosquitoes, such as *Aedes vexans*, \_\_\_\_\_ in damp places just above the water line of temporary ponds.

- A. Lay their eggs
- B. May produce
- C. Remain dormant
- D. Will only emerge
- E. None of the Above

5. The eggs hatch after a warm rain and \_\_\_\_\_ a new generation of adults in as little as a week.

- A. Lay their eggs
- B. May produce
- C. Remain dormant
- D. Will only emerge
- E. None of the Above

6. Eggs can also \_\_\_\_\_ for over two years during drought conditions.

- A. Lay their eggs
- B. May produce
- C. Remain dormant
- D. Will only emerge
- E. None of the Above

7. The adults will die from desiccation if exposed to dry sunny conditions and \_\_\_\_\_ from wooded areas at dusk or on dull, humid days.

- A. Lay their eggs
- B. May produce
- C. Remain dormant
- D. Will only emerge
- E. None of the Above

*Psorophora ciliata*

8. *Psorophora ciliata* is found only during \_\_\_\_\_ summers when other mosquitoes are abundant.

- A. Wet
- B. Fertile
- C. Carnivorous
- D. Host-seek
- E. None of the Above

9. Their larvae are \_\_\_\_\_ and each one consumes dozens of smaller mosquito larvae.

- A. Wet
- B. Fertile
- C. Carnivorous
- D. Host-seek
- E. None of the Above



Why do Mosquitoes Bite?

10. Mosquitoes belong to a group of insects that require blood to develop \_\_\_\_\_ eggs. Males do not lay eggs, thus, male mosquitoes do not bite.

- A. Wet
- B. Fertile
- C. Carnivorous
- D. Host-seek
- E. None of the Above

11. The females are the egg producers and " \_\_\_\_\_ " for a blood meal. Female mosquitoes lay multiple batches of eggs and require a blood meal for every batch they lay.

- A. Wet
- B. Fertile
- C. Carnivorous
- D. Host-seek
- E. None of the Above

12. Few people realize that mosquitoes rely on \_\_\_\_\_ as their main source of energy.

- A. Attractive
- B. Liquids
- C. Sugar
- D. Blood
- E. None of the Above

13. Both male and female mosquitoes feed on plant nectar, fruit juices, and \_\_\_\_\_ that ooze from plants.

- A. Attractive
- B. Liquids
- C. Sugar
- D. Blood
- E. None of the Above

14. The \_\_\_\_\_ is burned as fuel for flight and is replenished on a daily basis. Blood is reserved for egg production and is imbibed less frequently.

- A. Attractive
- B. Liquids
- C. Sugar
- D. Blood
- E. None of the Above

Why do Mosquitoes Leave Welts When they Bite?

15. When a female mosquito pierces the skin with her mouthparts, she injects a small amount of saliva into the wound before drawing \_\_\_\_\_.

- A. Attractive
- B. Liquids
- C. Sugar
- D. Blood
- E. None of the Above

16. Scientists are still investigating the complexities involved with mosquito host acceptance and rejection. Some people are highly attractive to mosquitoes and others are \_\_\_\_\_.

- A. Attractive
- B. Liquids
- C. Sugar
- D. Blood
- E. None of the Above

17. Mosquitoes have \_\_\_\_\_ to satisfy and process many different factors before they feed.

- A. Attractive
- B. Liquids
- C. Sugar
- D. Blood
- E. None of the Above

18. Many of the mosquito's \_\_\_\_\_ are poorly understood and many of the processes they use to evaluate potential blood meal hosts remain a mystery.

- A. Attractive
- B. Liquids
- C. Sugar
- D. Blood
- E. None of the Above

19. Female mosquitoes use the CO<sub>2</sub> we exhale as their primary cue to our location. A \_\_\_\_\_ mosquito is guided to our skin by following the slip stream of CO<sub>2</sub> that exudes from our breath.

- A. Colors
- B. Short-range
- C. Host-seeking
- D. Violent end
- E. None of the Above

#### Short Range Attractants

20. Once they have landed, they rely on a number of \_\_\_\_\_ attractants to determine if we are an acceptable blood meal host.

- A. Colors
- B. Short-range
- C. Attractive
- D. Violent end
- E. None of the Above

21. Folic acid is one chemical that appears to be particularly important. Fragrances from hair sprays, perfumes, deodorants, and soap can cover these chemical cues. They can also function to either enhance or \_\_\_\_\_ the host-seeking drive.

- A. Colors
- B. Short-range
- C. Attractive
- D. Repel
- E. None of the Above

22. Dark colors capture \_\_\_\_\_ and make most people more attractive to mosquitoes.

- A. Colors
- B. Heat
- C. Attractive
- D. Violent end
- E. None of the Above

23. Light \_\_\_\_\_ refract heat and are generally less attractive to mosquitoes.

- A. Colors
- B. Short-range
- C. Attractive
- D. Violent end
- E. None of the Above

24. Detergents, fabric softeners, perfumes and body odor can counteract the effects of color. In most cases, only the mosquito knows why one person is more \_\_\_\_\_ than another.

- A. Colors
- B. Short-range
- C. Attractive
- D. Violent end
- E. None of the Above

How Long do Mosquitoes Live?

25. Mosquitoes are relatively \_\_\_\_\_ insects with an adult life span that lasts about 2 weeks.

- A. Colors
- B. Fragile
- C. Attractive
- D. Violent end
- E. None of the Above

26. The vast majority meet a \_\_\_\_\_ by serving as food for birds, dragonflies, and spiders, or are killed by the effects of wind, rain or drought.

- A. Colors
- B. Short-range
- C. Attractive
- D. Violent end
- E. None of the Above

27. The mosquito species that only have a single generation each year are longer lived and may persist in \_\_\_\_\_ numbers for as long as 2-3 months if environmental conditions are favorable.

- A. Colors
- B. Short-range
- C. Small
- D. Violent end
- E. None of the Above

28. Mosquitoes that \_\_\_\_\_ in the adult stage live for 6-8 months, but spend most of that time in a state of torpor.

- A. Life cycle
- B. Hibernate
- C. Saliva
- D. Penetration
- E. None of the Above

29. Some of the mosquito species found in arctic regions enter hibernation twice and take more than a year to complete their \_\_\_\_\_.

- A. Life cycle
- B. Blood canal
- C. Saliva
- D. Penetration
- E. None of the Above

What Happens When Mosquitoes Bite?

30. The saliva makes \_\_\_\_\_ easier and prevents the blood from clotting in the narrow channel of her food canal.

- A. Life cycle
- B. Blood canal
- C. Saliva
- D. Penetration
- E. None of the Above

31. The welts that appear after the mosquito leaves is not a reaction to the wound but an \_\_\_\_\_ reaction to the saliva injected to prevent clotting. In most cases, the itching sensation and swellings subside within several hours.

- A. Life cycle
- B. Blood canal
- C. Saliva
- D. Allergic
- E. None of the Above

32. Some people are highly sensitive and symptoms persist for several days. Scratching the bites can result in infection if \_\_\_\_\_ from the fingernails are introduced to the wounds.

- A. Life cycle
- B. Bacteria
- C. Saliva
- D. Penetration

33. Where do mosquitoes go in the winter?

Mosquitoes, like most insects, are \_\_\_\_\_ creatures. As a result, they are incapable of regulating body heat, and their temperature is essentially the same as their surroundings.

- A. Life cycle
- B. Blood canal
- C. Saliva
- D. Cold-blooded
- E. None of the Above

34. Mosquitoes function best at 80°F, become \_\_\_\_\_ at 60°F and cannot function below 50°F.
- A. Lethargic
  - B. Blood canal
  - C. Saliva
  - D. Penetration
  - E. None of the Above

#### Mosquito Life Cycle

35. The type of standing water in which the mosquito chooses to lay her eggs depends upon the \_\_\_\_\_.
- A. Life cycle
  - B. Blood canal
  - C. Species
  - D. Penetration
  - E. None of the Above

36. The presence of beneficial predators such as \_\_\_\_\_ nymphs in permanent ponds, lakes, and streams usually keep these bodies of water relatively free of mosquito larvae.
- A. Life cycle
  - B. Fish and dragonfly
  - C. Saliva
  - D. None of the Above

37. Portions of marshes, swamps, clogged ditches, and temporary pools and puddles are all \_\_\_\_\_ mosquito breeding sites.
- A. Life cycle
  - B. Blood canal
  - C. Prolific
  - D. Penetration
  - E. None of the Above

38. Other sites in which some species lay their eggs include tree \_\_\_\_\_ such as old tires, buckets, toys, potted plant trays, and saucers and plastic covers or tarpaulins.
- A. Holes and containers
  - B. Annoying and potentially dangerous
  - C. Unique behaviors and bite
  - D. Collect and flood
  - E. None of the Above

39. Some of the most \_\_\_\_\_ mosquito species, such as the Asian tiger mosquito, come from these sites.
- A. Holes and containers
  - B. Annoying and potentially dangerous
  - C. Unique behaviors and bite
  - D. Collect and flood
  - E. None of the Above

Wrigglers and Tumblers

40. The mosquitoes in the United States, all of which live in specific habitats, exhibit \_\_\_\_\_ different types of animals. Despite these differences, all mosquitoes share some common traits, such as a four-stage life cycle.
- A. Holes and containers
  - B. Annoying and potentially dangerous
  - C. Unique behaviors and bite
  - D. Collect and flood
  - E. None of the Above
41. After the female mosquito obtains a blood meal (male mosquitoes do not bite), she lays her eggs directly on the surface of stagnant water, in a depression, or on the edge of a container where rainwater may \_\_\_\_\_ the eggs.
- A. Holes and containers
  - B. Annoying and potentially dangerous
  - C. Unique behaviors and bite
  - D. Collect and flood
  - E. None of the Above
42. The \_\_\_\_\_ and a mosquito larva or "wiggler" emerges.
- A. Holes and containers
  - B. Annoying and potentially dangerous
  - C. Unique behaviors and bite
  - D. Eggs hatch
  - E. None of the Above
43. The larva lives in the water, feeds, and develops into the third stage of the life cycle called a pupa or "tumbler". The pupa also \_\_\_\_\_, but no longer feeds.
- A. Holes and containers
  - B. Lives in the water
  - C. Unique behaviors and bite
  - D. None of the Above
44. Finally, the mosquito emerges from the pupal case and the water as a \_\_\_\_\_, ready to bite.
- A. Fully developed adult female
  - B. Annoying and potentially dangerous
  - C. Unique behaviors and bite
  - D. Collect and flood
  - E. None of the Above
45. Mosquitoes may overwinter as eggs, \_\_\_\_\_. Eggs, larvae, and pupae must have water to develop.
- A. Fertilized adult females or larvae
  - B. Annoying and potentially dangerous
  - C. Unique behaviors and bite
  - D. Collect and flood
  - E. None of the Above

46. Some female mosquitoes lay their eggs \_\_\_\_\_.
- A. Holes and containers
  - B. Annoying and potentially dangerous
  - C. Unique behaviors and bite
  - D. Directly on the water surface
  - E. None of the Above
47. Others lay their eggs on substrates above the water line (flood pool mosquitoes); \_\_\_\_\_.
- A. Holes and containers
  - B. Annoying and potentially dangerous
  - C. The eggs hatch upon flooding
  - D. Collect and flood
  - E. None of the Above
48. Mosquitoes belonging to the genus \_\_\_\_\_ lay their eggs in bunches or "rafts."
- A. Culex
  - B. Larvae
  - C. Female
  - D. Male
  - E. None of the Above
49. Each raft may contain up to 400 individual eggs. \_\_\_\_\_ feed on bits of organic matter dispersed in the water, becoming full grown in about one week. The pupal stage lasts two to three days.
- A. Culex
  - B. Larvae
  - C. Female
  - D. Male
  - E. None of the Above
50. \_\_\_\_\_ mosquitoes are ready to bite one to two days after adult emergence.
- A. Culex
  - B. Larvae
  - C. Female
  - D. Male
  - E. None of the Above
51. \_\_\_\_\_ mosquitoes do not bite but feed on flower nectar or plant juices. Some mosquitoes have only one generation per year, whereas others may have four or more.
- A. Culex
  - B. Larvae
  - C. Female
  - D. Male
  - E. None of the Above
52. \_\_\_\_\_ may fly 5 to 10 miles, but usually rest in grass, shrubbery, or other foliage close to the water breeding area.
- A. Culex
  - B. Larvae
  - C. Adults
  - D. Male
  - E. None of the Above

Mosquito Habitats

53. Few mosquito species in the U.S. breed in \_\_\_\_\_, such as streams.
- A. Running waters
  - B. Stream volume
  - C. Stream breeders
  - D. Along banks
  - E. None of the Above
54. Larvae can be flushed out when \_\_\_\_\_ increases, and to remain in the stream requires a large amount of energy.
- A. Running waters
  - B. Stream volume
  - C. Stream breeders
  - D. Along banks
  - E. None of the Above
55. The tropical genus *Chagasia* and some *Anopheles* species are \_\_\_\_\_. In addition, *Anopheles quadrimaculatus*, *Culex territans*, and *Uranotaenia sapphirina* have all been found in streams, although they prefer other habitats.
- A. Running waters
  - B. Stream volume
  - C. Stream breeders
  - D. Along banks
  - E. None of the Above
56. Stream breeders will find vegetation \_\_\_\_\_ with which to anchor themselves or attempt to remain away from the main flow of the stream by seeking isolated eddies.
- A. Running waters
  - B. Stream volume
  - C. Stream breeders
  - D. Along banks
  - E. None of the Above
57. Transient water sources, such as \_\_\_\_\_, snowpools, and ditches, are used as breeding grounds for mosquito species whose eggs can withstand desiccation, such as *Aedes* and *Psorophora*.
- A. Running waters
  - B. Stream volume
  - C. Stream breeders
  - D. Flooded areas
  - E. None of the Above
58. Their life cycles require alternating periods of wet and dry. Other species, like an opportunistic *Culex*, might be able to pull off a single generation during an extended \_\_\_\_\_.
- A. Running waters
  - B. Stream volume
  - C. Flooded period
  - D. Along banks
  - E. None of the Above



59. \_\_\_\_\_ generally shows water quality changes which result in various mosquito species using the same pool over a period of time.
- A. Running waters
  - B. Transient water
  - C. Stream breeders
  - D. Along banks
  - E. None of the Above
60. Genera associated with \_\_\_\_\_ are Anopheles, Culex, Culiseta, Coquillettidia, and Uranotaenia.
- A. Running waters
  - B. Stream volume
  - C. Stream breeders
  - D. Permanent water
  - E. None of the Above
61. Eggs of these species are not desiccant-resistant and must be laid directly \_\_\_\_\_.
- A. Running waters
  - B. On the water
  - C. Stream breeders
  - D. Along banks
62. As with transient waters, there is a seasonal change in the vegetation, \_\_\_\_\_, and mosquito species present.
- A. Water quality
  - B. Stream volume
  - C. Breeders
  - D. Along banks
  - E. None of the Above
63. Culiseta are found in \_\_\_\_\_ formed by pockets of water surrounding tree roots.
- A. Running waters
  - B. Stream volume
  - C. Crypts
  - D. Along banks
  - E. None of the Above

Containers

64. \_\_\_\_\_ sites generally have tannin-enriched water, which is characteristically clear, with rotting wood at the bottom.
- A. Treehole
  - B. Insulation
  - C. Containers
  - D. Artificial
  - E. None of the Above
65. Many \_\_\_\_\_ species now also use artificial sites, such as tires, since they provide insulation against the weather and are more numerous.
- A. Treehole
  - B. Insulation
  - C. Containers
  - D. Artificial
  - E. None of the Above

66. Artificial \_\_\_\_\_ are a convenient mode of transporting a species of mosquito outside of its natural range.
- A. Treehole
  - B. Insulation
  - C. Containers
  - D. Artificial
  - E. None of the Above

Mosquito Control Section

67. The mission of the Environmental Protection Agency (EPA) is to \_\_\_\_\_ and the environment.
- A. Protect human health
  - B. Minimize the risk of human exposure
  - C. Conduct surveillance for diseases
  - D. Evaluating larval populations
  - E. None of the Above

68. The EPA reviews and approves pesticides and their labeling to ensure that the pesticides used to protect public health are applied by methods which \_\_\_\_\_ and adverse health and environmental effects.
- A. Protect human health
  - B. Minimize the risk of human exposure
  - C. Conduct surveillance for diseases
  - D. Evaluating larval populations

How Are Mosquitoes Controlled with Pesticides and Other Methods?

69. The first step in mosquito control is surveillance. Mosquito specialists \_\_\_\_\_ harbored by domestic and nonnative birds, including sentinel chickens (used as virus transmission indicators), and mosquitoes.
- A. Protect human health
  - B. Minimize the risk of human exposure
  - C. Conduct surveillance for diseases
  - D. None of the Above

70. Surveillance for larval habitats is conducted by using maps and aerial photographs, and by \_\_\_\_\_.
- A. Protect human health
  - B. Minimize the risk of human exposure
  - C. Conduct surveillance for diseases
  - D. Evaluating larval populations
  - E. None of the Above

71. Other techniques include various light traps, biting counts, and \_\_\_\_\_.
- A. Protect human health
  - B. Minimize the risk of human exposure
  - C. Analysis of reports from the public
  - D. Evaluating larval populations
  - E. None of the Above

72. Mosquito control programs also put high priority on trying to \_\_\_\_\_, so that additional controls may not be necessary.

- A. Protect human health
- B. Minimize the risk of human exposure
- C. Conduct surveillance for diseases
- D. Prevent a large population of adult mosquitoes from developing
- E. None of the Above

73. Since mosquitoes must have water to breed, methods of prevention may include controlling water levels in lakes, marshes, ditches, or other mosquito breeding sites, \_\_\_\_\_ if possible, and stocking bodies of water with fish species that feed on larvae.

- A. Eliminating small breeding sites
- B. Minimize the risk of human exposure
- C. Conduct surveillance for diseases
- D. Evaluating larval populations
- E. None of the Above

74. Both chemical and biological measures may be employed to \_\_\_\_\_ during larval stages.

- A. Protect human health
- B. Minimize the risk of human exposure
- C. Conduct surveillance for diseases
- D. Kill immature mosquitoes
- E. None of the Above

#### Larvicides

75. \_\_\_\_\_ target larvae in the breeding habitat before they can mature into adult mosquitoes and disperse.

- A. Larvicides
- B. Mineral oils
- C. Liquid
- D. Mosquito controllers
- E. None of the Above

76. \_\_\_\_\_ include the bacterial insecticides *Bacillus thuringiensis israelensis* and *Bacillus sphaericus*, the insect growth inhibitor methoprene, and the organophosphate insecticide temephos.

- A. Larvicides
- B. Mineral oils
- C. Liquid
- D. Mosquito controllers
- E. None of the Above

77. \_\_\_\_\_ and other materials form a thin film on the surface of the water, which cause larvae and pupae to drown.

- A. Larvicides
- B. Mineral oils
- C. Liquid
- D. Mosquito controllers
- E. None of the Above

78. \_\_\_\_\_ larvicide products are applied directly to water using backpack sprayers and truck or aircraft-mounted sprayers. Tablet, pellet, granular, and briquette formulations of larvicides are also applied by mosquito controllers to breeding areas.

- A. Larvicides
- B. Mineral oils
- C. Liquid
- D. Mosquito controllers
- E. None of the Above

Methoprene (Altosid XR)

79. Methoprene (Altosid XR) is another safe material for control of mosquito larvae. It is an insect hormone that \_\_\_\_\_ of larvae (disrupts molting) and prevents mosquitoes from developing into adults.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Labeled for use in known fish habitats
- E. None of the Above

Altosid XR Briquettes

80. Altosid XR Briquettes \_\_\_\_\_. Treat swamps, ponds, and marsh areas in early spring before thawing.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Labeled for use in known fish habitats
- E. None of the Above

81. These extended-release briquettes will provide up to \_\_\_\_\_ once they hit the water.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Labeled for use in known fish habitats
- E. None of the Above

82. They can be applied by hand and the product is \_\_\_\_\_.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Labeled for use in known fish habitats
- E. None of the Above

Microbial insecticides

83. The product known as Bti (*Bacillus thuringiensis israeliensis*) can be as effective as chemical insecticides. When the bacteria Bti encysts, \_\_\_\_\_.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. It produces a protein crystal toxic to mosquito and midge larvae
- D. Labeled for use in known fish habitats
- E. None of the Above

84. Once the bacterium has been ingested, \_\_\_\_\_. It has no effect on a vast array of other aquatic organisms except midges in the same habitat. Bti strains are sold under the names Bactimos, Teknar and Vectobac.
- A. Retards the development
  - B. Can be placed even on ice for season-long control
  - C. 150 days of uninterrupted mosquito control
  - D. The toxin disrupts the lining of the larvae's intestine
  - E. None of the Above

#### Mosquito Dunks or Briquettes

85. Product Description: \_\_\_\_\_ objects that release bacteria into water where mosquitoes are breeding. When the larvae feed on the bacteria, they die.
- A. Small donut shaped and sized
  - B. Can be placed even on ice for season-long control
  - C. 150 days of uninterrupted mosquito control
  - D. Labeled for use in known fish habitats
  - E. None of the Above

#### Juvenile Hormone

86. Methoprene (sold under the name Altosid) is an insect growth regulator widely used by abatement districts to \_\_\_\_\_.
- A. Retards the development
  - B. Can be placed even on ice for season-long control
  - C. Control mosquito larvae
  - D. Labeled for use in known fish habitats
  - E. None of the Above

87. Methoprene \_\_\_\_\_, and when present in the larval habitat, it keeps immature insects from maturing into adults.
- A. Retards the development
  - B. Can be placed even on ice for season-long control
  - C. Mimics a natural juvenile hormone
  - D. Labeled for use in known fish habitats
  - E. None of the Above

88. Unable to metamorphose, the mosquitoes \_\_\_\_\_.
- A. Retards the development
  - B. Can be placed even on ice for season-long control
  - C. Die in the pupal stage
  - D. Labeled for use in known fish habitats
  - E. None of the Above

89. Vector control technicians sometimes use methoprene to reach larval sources that would \_\_\_\_\_.
- A. Retards the development
  - B. Can be placed even on ice for season-long control
  - C. Otherwise be difficult or dangerous to treat
  - D. Labeled for use in known fish habitats
  - E. None of the Above

90. Pellets \_\_\_\_\_ into underground septic tanks known to be breeding house mosquitoes.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Can be flushed down toilets
- E. None of the Above

91. The methoprene kills the mosquitoes without upsetting the septic system's \_\_\_\_\_.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Bacterial digestive processes
- E. None of the Above

#### Larvicidal Oils

92. Oils have been used for mosquito control for more than a century. The Marin / Sonoma District in California uses \_\_\_\_\_, a light-viscosity oil that spreads quickly and evenly over the water surface, preventing larvae and pupae from obtaining oxygen through the surface film.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

93. \_\_\_\_\_ have always been used as a product of last resort for the control of mosquito pupae, since this stage does not feed but does require oxygen. The only other option would be draining the source.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

#### Chemical Larvicides

94. Chlorinated hydrocarbons like DDT and \_\_\_\_\_ are very much a thing of the past, as are the use of organophosphate and carbamate insecticides.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

95. \_\_\_\_\_ were removed from the US market in 1964, and in 1987.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

Adulticides

96. \_\_\_\_\_ control may be undertaken to combat an outbreak of mosquito-borne disease or a very heavy nuisance infestation of mosquitoes in a community.
- A. Golden Bear 1111
  - B. Oils
  - C. Chlorinated hydrocarbons
  - D. Chlordane
  - E. None of the Above
97. Pesticides registered for this use are \_\_\_\_\_ and are applied either by aircraft or on the ground, employing truck-mounted sprayers.
- A. Golden Bear 1111
  - B. Oils
  - C. Chlorinated hydrocarbons
  - D. Adulticides
  - E. None of the Above
98. State and local agencies commonly use the \_\_\_\_\_ Malathion and Naled and the synthetic pyrethroid insecticides Permethrin, Resmethrin, and Sumithrin for adult mosquito control.
- A. Golden Bear 1111
  - B. Oils
  - C. Organophosphate insecticides
  - D. Chlordane
  - E. None of the Above
99. Mosquito adulticides are applied as \_\_\_\_\_ sprays. \_\_\_\_\_ sprayers dispense very fine aerosol droplets that stay aloft and kill flying mosquitoes on contact.
- A. Golden Bear 1111
  - B. Oils
  - C. Ultra-low volume (ULV)
  - D. Chlordane
  - E. None of the Above
100. \_\_\_\_\_ applications involve small quantities of pesticide active ingredient in relation to the size of the area treated, typically less than 3 ounces per acre, which minimizes exposure and risks to people and the environment.
- A. Golden Bear 1111
  - B. ULV
  - C. Chlorinated hydrocarbons
  - D. Chlordane
  - E. None of the Above
101. Chemical Control of Adult Mosquitoes  
Because of environmental concerns and drift, \_\_\_\_\_ are not the most popular method.
- A. Golden Bear 1111
  - B. Oils
  - C. Chlorinated hydrocarbons
  - D. Chemical pesticides
  - E. None of the Above

102. Chemical pesticides, the technique used for adult mosquito control is known as \_\_\_\_\_ spray.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

103. A small quantity of the pesticide is \_\_\_\_\_ and broadcast in a fog that drifts into sites where the adult mosquitoes hide. At best, control is achieved up to 300 feet away, but it does help reduce the numbers of biting mosquitoes to tolerable levels.

- A. Aerosol bombs
- B. Hand-carried dispersal units
- C. ULV spraying
- D. Atomized into micron-size particles
- E. None of the Above

104. In recent years the use of vehicle-mounted units has decreased in favor of small, \_\_\_\_\_. This allows a more precise application of the pesticide.

- A. Aerosol bombs
- B. Hand-carried dispersal units
- C. ULV spraying
- D. Aerosol foggers
- E. None of the Above

105. The pesticide used for \_\_\_\_\_ is pyrethrum (sold as Pyrocide), a naturally occurring substance harvested from two species of Old World chrysanthemums, or pyrethrum flowers.

- A. Aerosol bombs
- B. Hand-carried dispersal units
- C. ULV spraying
- D. Aerosol foggers
- E. None of the Above

106. This material is the \_\_\_\_\_ for mosquito control, and it degrades into non-toxic by-products within 4 to 6 hours after spraying.

- A. Aerosol bombs
- B. Hand-carried dispersal units
- C. Least toxic available
- D. Aerosol foggers
- E. None of the Above

#### Indoor Control

107. Space sprays or aerosol "bombs," containing synergized pyrethrins 0.1%, are effective against adult mosquitoes. \_\_\_\_\_ may be needed during problem periods.

- A. Frequent treatments
- B. Temporary treatment
- C. One to two days of treatment
- D. Residual treatment
- E. None of the Above



Outdoor Control Adulticides

108. Space sprays or aerosol foggers containing pyrethrins result in rapid knockdown of adult mosquitoes. However, it is a \_\_\_\_\_ with little residual effect.

- A. Frequent treatments
- B. Temporary treatment
- C. One to two days of treatment
- D. Residual treatment
- E. None of the Above

109. \_\_\_\_\_ applied to tall grasses, weeds, trees, shrubs, and outbuildings, one to two days before use of the area, are effective.

- A. Frequent treatments
- B. Temporary treatment
- C. One to two days of treatment
- D. Residual sprays
- E. None of the Above

110. Some insecticides registered for residual mosquito control include: \_\_\_\_\_, chlorpyrifos (Dursban), and Malathion.

- A. Carbaryl (Sevin)
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

111. Malathion and \_\_\_\_\_ are extremely toxic to honey bees. Do not spray plants when in bloom. Mow weedy areas before treatment.

- A. Chlorinated hydrocarbons
- B. Oils
- C. Carbaryl (Sevin)
- D. Chlordane
- E. None of the Above

112. Bee losses are minimized by spraying late in the afternoon when bees are gone or when temperatures are below 45°F. \_\_\_\_\_ and methoxychlor are highly toxic to fish.

- A. Chlorinated hydrocarbons
- B. Oils
- C. Carbaryl (Sevin)
- D. Malathion
- E. None of the Above

Mosquito fish (*Gambusia affinis*)

113. Mosquito fish can eat \_\_\_\_\_ per day. They play an important role in mosquito control in ponds, canals, irrigated fields, and some other freshwater sources.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. Encephalitis
- D. Deet
- E. None of the Above

114. The fish live two to three years; they are live-bearing and produce \_\_\_\_\_ each year.
- A. 100 to 500 larvae
  - B. 3 to 4 broods
  - C. Encephalitis
  - D. Deet
  - E. None of the Above

#### Repellents

115. Repellents applied to the skin and clothing will prevent mosquito bites for \_\_\_\_\_ depending on the person, type, number of mosquitoes, and the type and percent of active ingredient in the repellent.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. One to five hours
- D. Deet
- E. None of the Above

116. N, N-Diethyl-m-toluamide (Deet) is very effective and widely used as a \_\_\_\_\_, but it should not be used indiscriminately, as severe allergies can develop.

- A. Frequent treatments
- B. Temporary treatment
- C. One to two days of treatment
- D. Residual treatment
- E. None of the Above

#### Prevention

117. Since most of the mosquitoes that transmit \_\_\_\_\_ will not travel very far, the risk of contracting \_\_\_\_\_ can be minimized by controlling the mosquito breeding sites that are in close proximity to your home.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. Encephalitis
- D. Deet
- E. None of the Above

118. Water management, to prevent mosquito breeding, is essential for control. Eggs do not hatch unless they are \_\_\_\_\_.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. In water
- D. Deet
- E. None of the Above

#### Pesticides and Mosquito Control Summary

119. Mosquito-borne diseases affect millions of people worldwide each year. In the United States, some species of mosquitoes can transmit diseases such as \_\_\_\_\_, dengue fever, and malaria to humans, and a variety of diseases to wildlife and domestic animals.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Encephalitis
- D. Human exposure
- E. None of the Above

120. To combat mosquitoes and the public health hazards they present, many states and localities have established \_\_\_\_\_.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Mosquito control programs
- D. Human exposure
- E. None of the Above

121. These programs, which are based on \_\_\_\_\_, can include non-chemical forms of prevention and control, as well as ground and aerial application of chemical and biological pesticides.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Encephalitis
- D. Human exposure
- E. None of the Above

122. The mission of the Environmental Protection Agency (EPA) is to protect \_\_\_\_\_ and the environment.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Human health
- D. Human exposure
- E. None of the Above

123. The EPA reviews and approves pesticides and their labeling to ensure that the pesticides used to protect \_\_\_\_\_ are applied by methods that minimize the risk of human exposure and adverse health and environmental effects.

- A. Public health
- B. Infectious diseases
- C. Encephalitis
- D. Human exposure
- E. None of the Above

124. In relation to mosquito control, the Agency also serves as a source of information about pesticide and \_\_\_\_\_ to address the concerns of the general public, news media, and the state and local agencies dealing with outbreaks of infectious diseases or heavy infestations of mosquitoes.

- A. Non-pesticide controls
- B. Infectious diseases
- C. Encephalitis
- D. Human exposure
- E. None of the Above

#### Malathion for Mosquito Control

125. Officials responsible for mosquito control programs make decisions to use pesticides based on an evaluation of the \_\_\_\_\_ from diseases transmitted by mosquitoes or on an evaluation of the nuisance level that communities can tolerate from a mosquito infestation.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Risks to the general public
- D. Human exposure
- E. None of the Above

126. Based on \_\_\_\_\_, mosquito control officials select specific pesticides and other control measures that best suit local conditions in order to achieve effective control of mosquitoes with the least impact on human health and the environment.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Surveillance and monitoring
- D. Human exposure
- E. None of the Above

127. It is especially important to conduct effective \_\_\_\_\_ by eliminating breeding habitats or applying pesticides to control the early life stages of the mosquito.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Mosquito prevention programs
- D. Human exposure
- E. None of the Above

128. \_\_\_\_\_, such as elimination of any standing water that could serve as a breeding site, help reduce the adult mosquito population and the need to apply other pesticides for adult mosquito control.

- A. Prevention programs
- B. Infectious diseases
- C. Encephalitis
- D. Human exposure
- E. None of the Above

129. Since no pesticide can be considered 100 percent safe, pesticide applicators and the general public should always exercise care and follow specified \_\_\_\_\_ during use to reduce risks.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Safety precautions
- D. Human exposure
- E. None of the Above

What is Malathion?

130. Malathion is an organophosphate (OP) \_\_\_\_\_ that has been registered for use in the United States since 1956.

- A. Insecticide
- B. To kill mosquitoes
- C. Kill adult mosquitoes
- D. Larva
- E. None of the Above

131. When applied in accordance with the rate of application and safety precautions specified on the label, Malathion can be used \_\_\_\_\_ without posing unreasonable risks to human health or the environment.

- A. Insecticide
- B. To kill mosquitoes
- C. Kill adult mosquitoes
- D. Larva
- E. None of the Above

How is Malathion Used in Mosquito Control?

132. The mosquito goes through four distinct stages during its life cycle: egg, larva, pupa, and adult. Malathion is an adulticide, used to \_\_\_\_\_.

- A. Insecticide
- B. To kill mosquitoes
- C. Kill adult mosquitoes
- D. Larva
- E. None of the Above

133. In mosquito control programs conducted by state or local authorities, Malathion is applied by truck-mounted or \_\_\_\_\_.

- A. Insecticide
- B. Aircraft-mounted sprayers
- C. Kill adult mosquitoes
- D. Ultra-low volume (ULV) spray
- E. None of the Above

134. Malathion is applied as an \_\_\_\_\_. \_\_\_\_\_ sprayers dispense very fine aerosol droplets that stay aloft and kill mosquitoes on contact. \_\_\_\_\_ applications involve small quantities of pesticide active ingredient in relation to the size of the area treated.

- A. Insecticide
- B. Aircraft-mounted sprayers
- C. Kill adult mosquitoes
- D. Ultra-low volume (ULV) spray
- E. None of the Above

135. For mosquito control, Malathion is applied at a maximum rate of 0.23 pounds (or about 2.5 fluid ounces) of active ingredient per acre, which \_\_\_\_\_ exposure and risks to people and the environment.

- A. Minimizes
- B. Kill mosquitoes
- C. Maximizes
- D. Kill larva
- E. None of the Above

136. Malathion can be used for \_\_\_\_\_ programs without posing unreasonable risks to the general population when applied according to the label.

- A. Public health mosquito control
- B. Adults and children
- C. Small amount of active ingredient
- D. Skin and inhalation exposure
- E. None of the Above

137. The EPA has estimated the exposure and risks to both \_\_\_\_\_ posed by ULV aerial and ground applications of Malathion.

- A. Public health mosquito control
- B. Adults and children
- C. Small amount of active ingredient
- D. Skin and inhalation exposure
- E. None of the Above

138. Because of the very \_\_\_\_\_ released per acre of ground, the estimates found that for all scenarios considered, exposures were hundreds or even thousands of times below an amount that might pose a health concern.

- A. Public health mosquito control
- B. Adults and children
- C. Small amount of active ingredient
- D. Skin and inhalation exposure
- E. None of the Above

139. These estimates assumed several spraying events over a period of weeks, and also assumed that a toddler would ingest some soil and grass in addition to \_\_\_\_\_.

- A. High-dose poisoning
- B. Nausea, dizziness, or confusion
- C. Small amount of active ingredient
- D. Skin and inhalation exposure
- E. None of the Above

140. At high doses, Malathion, like other organophosphates, can overstimulate the nervous system, causing \_\_\_\_\_.

- A. High-dose poisoning
- B. Nausea, dizziness, or confusion
- C. Small amount of active ingredient
- D. Skin and inhalation exposure
- E. None of the Above

141. Severe \_\_\_\_\_ with any organophosphate can cause convulsions, respiratory paralysis, and death.

- A. Public health mosquito control
- B. Adults and children
- C. High-dose poisoning
- D. Skin and inhalation exposure
- E. None of the Above

142. Malathion used in mosquito control programs does not pose unreasonable \_\_\_\_\_ or the environment.

- A. Risks to wildlife
- B. Low toxicity
- C. Toxic to insects
- D. To reduce risks
- E. None of the Above

143. Malathion degrades rapidly in the environment, especially in moist soil, and it displays \_\_\_\_\_ to birds and mammals.

- A. Risks to wildlife
- B. Low toxicity
- C. Toxic to insects
- D. To reduce risks
- E. None of the Above

144. Malathion is highly \_\_\_\_\_, including beneficial insects such as honeybees.

- A. Risks to wildlife
- B. Low toxicity
- C. *Toxic to insects*
- D. To reduce risks
- E. None of the Above

145. For that reason, the EPA has established specific precautions on the label to reduce such \_\_\_\_\_.

- A. *Risks*
- B. Low toxicity
- C. *Toxic to insects*
- D. To reduce risks
- E. None of the Above

#### Larvicides For Mosquito Control

146. Prevention programs, such as the elimination of any standing water that could serve as a breeding site, help reduce the adult \_\_\_\_\_ and the need to apply other pesticides for adult mosquito control.

- A. Risks to wildlife
- B. Mosquito population
- C. Toxic to insects
- D. To reduce risks
- E. None of the Above

147. Since no pesticide can be considered 100 percent safe, pesticide applicators and the general public should always exercise care and follow specified safety precautions during use \_\_\_\_\_.

- A. Risks to wildlife
- B. Low toxicity
- C. Toxic to insects
- D. To reduce risks
- E. None of the Above

#### Larvicides

148. Larvicides kill mosquito larvae. Larvicides include \_\_\_\_\_, such as the microbial larvicides *Bacillus sphaericus* and *Bacillus thuringiensis israelensis*.

- A. Biological insecticides
- B. Adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Pesticide usage
- E. None of the Above

149. Larvicides include other pesticides, such as temephos, methoprene, oils, and monomolecular films. Larvicide treatment of breeding habitats help reduce the \_\_\_\_\_ in nearby areas.

- A. Biological insecticides
- B. Adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Pesticide usage
- E. None of the Above

How are Larvicides Used in Mosquito Control?

150. State and local agencies in charge of mosquito control typically employ a variety of techniques in an \_\_\_\_\_ program.

- A. Biological insecticides
- B. Adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Pesticide usage
- E. None of the Above

151. An IPM approach includes surveillance, \_\_\_\_\_, larviciding, and adulticiding to control mosquito populations.

- A. Biological insecticides
- B. Adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Source reduction
- E. None of the Above

152. Since mosquitoes must have water to breed, source reduction can be as simple as turning over trapped water in a container to undertaking large-scale \_\_\_\_\_ of marsh water levels.

- A. Engineering and management
- B. Adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Pesticide usage
- E. None of the Above

153. Larviciding involves applying pesticides to breeding habitats to kill mosquito larvae.

Larviciding can reduce overall \_\_\_\_\_ in a control program.

- A. Biological insecticides
- B. Adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Pesticide usage
- E. None of the Above

154. Killing mosquito larvae before they emerge as adults can reduce or \_\_\_\_\_ the need for ground or aerial application of pesticides to kill adult mosquitoes.

- A. Biological insecticides
- B. Adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Eliminate
- E. None of the Above

What are Microbial Larvicides?

155. \_\_\_\_\_ are bacteria that are registered as pesticides for control of mosquito larvae in outdoor areas such as irrigation ditches, flood water, standing ponds, woodland pools, pastures, tidal water, fresh or saltwater marshes, and storm water retention areas.

- A. Microbial larvicides
- B. Mosquito species
- C. *Bacillus thuringiensis israelensis* (Bti)
- D. Naturally occurring soil bacterium
- E. None of the Above



156. Duration of effectiveness depends primarily on the \_\_\_\_\_, the environmental conditions, the formulation of the product, and water quality.

- A. Microbial larvicides
- B. Mosquito species
- C. *Bacillus thuringiensis israelensis* (Bti)
- D. Naturally occurring soil bacterium

157. \_\_\_\_\_ may be used along with other mosquito control measures in an IPM program.

- A. Microbial larvicides
- B. Mosquito species
- C. *Bacillus thuringiensis israelensis* (Bti)
- D. Naturally occurring soil bacterium
- E. None of the Above

158. The microbial larvicides used for mosquito control are \_\_\_\_\_ and *Bacillus sphaericus* (*B. sphaericus*).

- A. Microbial larvicides
- B. Mosquito species
- C. *Bacillus thuringiensis israelensis* (Bti)
- D. Naturally occurring soil bacterium
- E. None of the Above

159. *Bacillus thuringiensis israelensis* is a \_\_\_\_\_ registered for control of mosquito larvae. Bti was first registered by the EPA as an insecticide in 1983.

- A. Microbial larvicides
- B. Mosquito species
- C. *Bacillus thuringiensis israelensis* (Bti)
- D. Naturally occurring soil bacterium
- E. None of the Above

160. Mosquito larvae eat the \_\_\_\_\_ product that is made up of the dormant spore form of the bacterium and an associated pure toxin.

- A. Microbial larvicides
- B. Mosquito species
- C. *Bacillus thuringiensis israelensis* (Bti)
- D. Naturally occurring soil bacterium
- E. None of the Above

161. The toxin disrupts the gut in the mosquito by binding to receptor cells present in insects, but not in \_\_\_\_\_.

- A. Mammals
- B. Mosquito species
- C. *Bacillus thuringiensis israelensis* (Bti)
- D. Naturally occurring soil bacterium
- E. None of the Above

162. There are \_\_\_\_\_ for use in the United States. Aquabac, Teknar, Vectobac, and LarvX are examples of common trade names for the mosquito control products.

- A. EPA as an insecticide in 1983
- B. 26 Bti products registered
- C. Registered by the EPA in 1991
- D. One to four weeks
- E. None of the Above

163. *Bacillus sphaericus* is a naturally occurring bacterium that is found throughout the world. *B. sphaericus* was initially \_\_\_\_\_ for use against various kinds of mosquito larvae.

- A. EPA as an insecticide in 1983
- B. 26 Bti products registered
- C. Registered by the EPA in 1991
- D. One to four weeks
- E. None of the Above

164. VectoLex CG and WDG are registered *B. sphaericus* products and are effective for approximately \_\_\_\_\_ after application.

- A. EPA as an insecticide in 1983
- B. 26 Bti products registered
- C. Registered by the EPA in 1991
- D. One to four weeks
- E. None of the Above

165. The microbial pesticides have undergone extensive testing prior to registration. They are essentially \_\_\_\_\_, so there are no concerns for human health effects with Bti or *B. sphaericus* when they are used according to label directions.

- A. Nontoxic to humans
- B. Pose risks to wildlife
- C. Do not pose risks
- D. Risks to human health
- E. None of the Above

Do Microbial Larvicides Pose Risks to Wildlife or the Environment?

166. Extensive testing shows that microbial larvicides \_\_\_\_\_, nontarget species, or the environment, when used according to label directions.

- A. Nontoxic to humans
- B. Pose risks to wildlife
- C. Do not pose risks to wildlife
- D. Risks to human health
- E. None of the Above

What is Methoprene?

167. Methoprene is a compound first \_\_\_\_\_ that mimics the action of an insect growth-regulating hormone and prevents the normal maturation of insect larvae.

- A. EPA as an insecticide in 1983
- B. 26 Bti products registered
- C. Registered by the EPA in 1975
- D. One to four weeks
- E. None of the Above

168. It is \_\_\_\_\_ to kill mosquito larvae, and it may be used along with other mosquito control measures in an IPM program.

- A. Solids
- B. Sand granules
- C. Applied to water
- D. Liquid and pelletized formulations
- E. None of the Above

169. Altosid is the name of the methoprene product used in mosquito control and is applied as briquettes (similar in form to charcoal briquettes), pellets, \_\_\_\_\_, and liquids.

- A. Solids
- B. Sand granules
- C. Applied to water
- D. Crystals
- E. None of the Above

170. The \_\_\_\_\_ can be applied by helicopter and fixed-wing aircraft.

- A. Solids
- B. Sand granules
- C. Applied to water
- D. Liquid and pelletized formulations
- E. None of the Above

Does Methoprene Pose Risks to Human Health?

171. Methoprene, used for mosquito control according to its label directions, \_\_\_\_\_ to human health. In addition to posing low toxicity to mammals, there is little opportunity for human exposure, since the material is applied directly to ditches, ponds, marshes, or flooded areas that are not drinking water sources.

- A. Nontoxic to humans
- B. Pose risks to wildlife
- C. Do not pose unreasonable risks
- D. Risks to human health
- E. None of the Above

172. Does Methoprene Pose Risks to Wildlife or the Environment?

Methoprene used in mosquito control programs does \_\_\_\_\_ or the environment.

- A. Nontoxic to humans
- B. Pose risks to wildlife
- C. Not pose unreasonable risks to wildlife
- D. Risks to human health
- E. None of the Above

173. Toxicity of methoprene to birds and fish is low, and it is \_\_\_\_\_.

- A. Nontoxic to humans
- B. Pose risks to wildlife
- C. Do not pose risks
- D. Nontoxic to bees
- E. None of the Above

174. Methoprene breaks down quickly in water and soil and \_\_\_\_\_ into ground water.

- A. Will not leach
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to human health
- E. None of the Above

175. Methoprene mosquito control products present \_\_\_\_\_ risk to freshwater fish, freshwater invertebrates, and estuarine species.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to human health
- E. None of the Above

176. Temephos is an organophosphate (OP) pesticide \_\_\_\_\_ to control mosquito larvae, and it is the only organophosphate with larvicidal use.

- A. EPA as an insecticide in 1983
- B. 26 Bti products registered
- C. Registered by the EPA in 1991
- D. Registered by the EPA in 1965
- E. None of the Above

177. It is an important \_\_\_\_\_ for mosquito control programs; its use helps prevent mosquitoes from developing resistance to the bacterial larvicides.

- A. Insecticide
- B. To kill mosquitoes
- C. Kill adult mosquitoes
- D. Resistance management tool
- E. None of the Above

178. Temephos is used in areas of \_\_\_\_\_, shallow ponds, swamps, marshes, and intertidal zones. It may be used along with other mosquito control measures in an IPM program.

- A. Running waters
- B. Standing water
- C. Stream breeders
- D. Along banks
- E. None of the Above

179. Abate is the trade name of the \_\_\_\_\_ used for mosquito control.

- A. Golden Bear 1111
- B. Oils
- C. Temephos product
- D. Chlordane
- E. None of the Above

180. Temephos is applied most commonly by \_\_\_\_\_, but can be applied by backpack sprayers, fixed-wing aircraft, and right-of-way sprayers in either liquid or granular form.

- A. Aerosol bombs
- B. Hand-carried dispersal units
- C. Helicopter
- D. Aerosol foggers
- E. None of the Above

181. It is \_\_\_\_\_, and the amount of temephos is very small in relation to the area covered, less than 1 ounce of active ingredient per acre for the liquid and 8 ounces per acre for the granular formulations.

- A. Holes and containers
- B. Annoying and potentially dangerous
- C. Unique behaviors and bite
- D. Applied to water
- E. None of the Above

Does Temephos Pose Risks to Human Health?

182. Temephos, applied according to the label for mosquito control, \_\_\_\_\_ to human health.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not unreasonable pose risks
- D. None of the Above

183. Current mosquito larviciding techniques pose \_\_\_\_\_ aquatic species and the aquatic ecosystem.

- A. Nontoxic
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Some risk to nontarget
- E. None of the Above

184. Although temephos presents \_\_\_\_\_ to birds and terrestrial species, available information suggests that it is more toxic to aquatic invertebrates than alternative larvicides.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Relatively low risk
- E. None of the Above

185. For this reason, the EPA is limiting temephos use to areas where \_\_\_\_\_ would not be effective, specifying intervals between applications, and limiting the use of high application rates.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Less-hazardous alternatives
- E. None of the Above

186. Temephos \_\_\_\_\_, and post-application exposure is minimal.

- A. Breaks down within a few days in water
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Toxin disrupts the lining of the larvae's intestine
- E. None of the Above

187. Does Temephos Pose Risks to Wildlife or the Environment?

Because temephos is applied directly to water, it is not \_\_\_\_\_ on terrestrial animals or birds.

- A. Breaks down within a few days in water
- B. Expected to have a direct impact
- C. 150 days of uninterrupted mosquito control
- D. Toxin disrupts the lining of the larvae's intestine
- E. None of the Above

Monomolecular Films?

188. Monomolecular films are low-toxicity pesticides that spread a thin film on the surface of the water that makes it difficult for mosquito \_\_\_\_\_, pupae, and emerging adults to attach to the water's surface, causing them to drown.

- A. Insecticide
- B. Deet
- C. Kill adult mosquitoes
- D. Larvae
- E. None of the Above

189. Films may remain active typically for \_\_\_\_\_ on standing water, and have been used in the United States in floodwaters, brackish waters, and ponds.

- A. One day
- B. 10-14 days
- C. One year
- D. One to four weeks
- E. None of the Above

190. They may be used along with other mosquito control measures in an IPM program. They are also known under the trade names \_\_\_\_\_ and Agnique MMF.

- A. Golden Bear 1111
- B. Arosurf MSF
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

Do Monomolecular Films Pose Risks to Human Health?

191. Monomolecular films, used according to label directions for larva and pupa control,

\_\_\_\_\_.

- A. Toxic to humans
- B. Minimal acute and chronic
- C. Do not pose risks to human health
- D. Risks to human health
- E. None of the Above

192. In addition to low toxicity, there is \_\_\_\_\_, since the material is applied directly to ditches, ponds, marshes, or flooded areas that are not drinking water sources.

- A. Little opportunity for human exposure
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to human health
- E. None of the Above

Do Films Pose Risks to Wildlife or the Environment?

193. Monomolecular films, used according to label directions for larva and pupa control, \_\_\_\_\_ to the environment.

- A. Nontoxic
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Pose minimal risks
- E. None of the Above

194. They do not last very long in the environment, and are usually applied only to standing water, such as \_\_\_\_\_, woodland pools, or containers that contain few nontarget organisms.

- A. Running waters
- B. On ponds
- C. Stream breeders
- D. Roadside ditches
- E. None of the Above

What are Oils?

195. \_\_\_\_\_, like films, are pesticides used to form a coating on top of water to drown larvae, pupae, and emerging adult mosquitoes.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

196. They are specially derived from petroleum distillates and have been used for many years in the United States to \_\_\_\_\_ on crops and orchard trees, and to control mosquitoes. They may be used along with other mosquito control measures in an IPM program.

- A. Insecticide
- B. To kill mosquitoes
- C. Kill aphids
- D. Larva
- E. None of the Above

197. Trade names for oils used in mosquito control are Bonide, BVA2, and \_\_\_\_\_.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

Do Oils Pose Risks to Human Health?

198. Oils, used according to label directions for larva and pupa control, \_\_\_\_\_ to human health.

- A. Nontoxic
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks
- E. None of the Above

199. In addition to \_\_\_\_\_, there is little opportunity for human exposure, since the material is applied directly to ditches, ponds, marshes, or flooded areas that are not drinking water sources.

- A. Low toxicity
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to human health
- E. None of the Above

Do Oils Pose Risks to Wildlife or the Environment?

200. Oils, if misapplied, \_\_\_\_\_ and other aquatic organisms. For that reason, the EPA has established specific precautions on the label to reduce such risks.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. May be toxic to fish
- D. Risks to human health
- E. None of the Above

Naled For Mosquito Control

201. Officials responsible for mosquito control programs make decisions to use pesticides based on an evaluation of the \_\_\_\_\_ from diseases transmitted by mosquitoes or on an evaluation of the nuisance level that communities can tolerate from a mosquito infestation.

- A. Risk of low toxicity
- B. Risk of acute and chronic
- C. Risks to the general public
- D. Risks to animals
- E. None of the Above

202. Based on surveillance and monitoring, mosquito control officials select specific pesticides and other control measures that best suit local conditions in order to achieve effective control of mosquitoes with the \_\_\_\_\_ and the environment.

- A. Nontoxic to humans
- B. Least impact on human health
- C. Do not pose risks
- D. Risks to human health
- E. None of the Above

203. It is especially important to conduct effective mosquito prevention programs by eliminating \_\_\_\_\_ or applying pesticides to control the early life stages of the mosquito.

- A. Insecticide
- B. To kill mosquitoes
- C. Breeding habitats
- D. Larvae
- E. None of the Above



204. Prevention programs, such as elimination of any standing water that could serve as a breeding site, help \_\_\_\_\_ mosquito population and the need to apply other pesticides for adult mosquito control.

- A. Insecticide
- B. To kill mosquitoes
- C. Reduce adult mosquito
- D. Larvae
- E. None of the Above

What is Naled?

205. Naled is an organophosphate (OP) insecticide that has been \_\_\_\_\_ for use in the United States.

- A. EPA as an insecticide in 1983
- B. 26 Bti products registered
- C. Registered by the EPA in 1975
- D. Registered since 1959
- E. None of the Above

206. It is used primarily for controlling adult mosquitoes, but Naled is also used on food and feed crops, and in greenhouses. When applied in accordance with the rate of application and the safety precautions specified on the label, Naled can be used to kill mosquitoes without posing unreasonable \_\_\_\_\_ or the environment.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to human health
- E. None of the Above

How is Naled Used in Mosquito Control?

207. Naled is an adulticide used to \_\_\_\_\_. In mosquito control programs conducted by state or local authorities, Naled is applied by truck-mounted or aircraft-mounted sprayers.

- A. Insecticide
- B. To kill mosquitoes
- C. Kill adult mosquitoes
- D. Larva
- E. None of the Above

208. Naled is applied as an Ultra-low volume (ULV) spray. \_\_\_\_\_ sprayers dispense very fine aerosol droplets that stay aloft and kill mosquitoes on contact. Ultra-low volume (ULV) applications involve small quantities of pesticide active ingredient in relation to the size of the area treated.

- A. Golden Bear 1111
- B. Oils
- C. Ultra-low volume (ULV)
- D. Chlordane
- E. None of the Above

209. For mosquito control, Naled is applied at a maximum rate of \_\_\_\_\_ of active ingredient per acre for aerial application and 0.1 pounds (0.33 ounce) per acre for ground application, which minimizes exposure and risks to people and the environment.

- A. 100 to 500
- B. 3 to 4 broods
- C. In water
- D. 0.05 pounds (0.8 ounce)
- E. None of the Above

Does Naled Pose Risks to Human Health?

210. Naled can be used for public health mosquito control programs without posing unreasonable \_\_\_\_\_ when applied according to the label.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to the general population
- E. None of the Above

211. The EPA has estimated the exposure and \_\_\_\_\_ posed by ULV aerial and ground applications of Naled.

- A. Nontoxic to humans
- B. Risks to both adults and children
- C. Do not pose risks
- D. Minimal acute and chronic
- E. None of the Above

212. Because of the very small amount of active ingredient released per acre of ground, the estimates found that for all scenarios considered, exposures were hundreds or even thousands of times below an amount that \_\_\_\_\_.

- A. Nontoxic to humans
- B. Risks to both adults and children
- C. Might pose a health concern
- D. Minimal acute and chronic
- E. None of the Above

213. These estimates assumed several spraying events over a period of weeks, and also assumed that a toddler would ingest some soil and grass in addition to skin and \_\_\_\_\_.

- A. Nausea
- B. Dizziness
- C. Do not pose risks
- D. Inhalation exposure
- E. None of the Above

214. Naled like other organophosphates, can over stimulate the nervous system causing \_\_\_\_\_, dizziness, or confusion.

- A. Nausea
- B. Convulsions
- C. Do not pose risks
- D. Minimal acute and chronic
- E. None of the Above

215. Severe high-dose poisoning with any organophosphate can cause convulsions, respiratory paralysis, and \_\_\_\_\_.

- A. Nausea
- B. Dizziness
- C. Do not pose risks
- D. Death
- E. None of the Above

216. Does Naled Pose Risks to Wildlife or the Environment?

Naled used in mosquito control programs does not pose unreasonable \_\_\_\_\_ or the environment.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Risks to wildlife
- D. Risks to human health
- E. None of the Above

217. Naled degrades rapidly in the environment, and it displays \_\_\_\_\_ to birds and mammals.

- A. Nontoxic
- B. Low toxicity
- C. Do not pose risks
- D. Extreme risks
- E. None of the Above

218. \_\_\_\_\_ risk to fish is not expected, but there is potential for risks to invertebrates from the repeated use of Naled.

- A. Toxic
- B. Acute and chronic
- C. Do not pose risks
- D. High risks
- E. None of the Above

219. Naled is \_\_\_\_\_ to insects, including beneficial insects such as honeybees. For that reason, the EPA has established specific precautions on the label to reduce such risk.

- A. Nontoxic
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Highly toxic
- E. None of the Above

What are Synthetic Pyrethroids?

220. Pyrethroids are synthetic chemical insecticides that act in a similar manner to \_\_\_\_\_, which are derived from chrysanthemum flowers.

- A. Golden Bear 1111
- B. Pyrethrins
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

221. Pyrethroids are widely used for controlling various insects. Permethrin, \_\_\_\_\_, and sumithrin are synthetic pyrethroids commonly used in mosquito control programs to kill adult mosquitoes.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Resmethrin
- E. None of the Above

222. Permethrin has been \_\_\_\_\_. It is currently registered and sold in a number of products such as household insect foggers and sprays, tick and flea sprays for yards, flea dips and sprays for cats and dogs, termite treatments, agricultural and livestock products, and mosquito abatement products.

- A. EPA as an insecticide in 1983
- B. Registered by the EPA since 1977
- C. Registered by the EPA in 1975
- D. Registered by the EPA since 1998
- E. None of the Above

223. Resmethrin has been \_\_\_\_\_ and is used to control flying and crawling insects in the home, lawn, garden, and industrial sites. It can also be used to control insects on ornamental plants (outdoor and greenhouse use), on pets and horses, and as a mosquitoicide.

- A. EPA as an insecticide in 1983
- B. Registered by the EPA since 1977
- C. Registered by the EPA in 1975
- D. Registered by the EPA since 1971
- E. None of the Above

224. Sumithrin has been \_\_\_\_\_ and is used to control adult mosquitoes and as an insecticide in transport vehicles such as aircraft, ships, railroad cars, and truck trailers..

- A. EPA as an insecticide in 1983
- B. Registered by the EPA since 1977
- C. Registered by the EPA in 1975
- D. Registered by the EPA since 1971
- E. None of the Above

#### Synthetic Pyrethroids Used in Adult Mosquito Control

225. Most \_\_\_\_\_ control products can be applied only by public health officials and trained personnel of mosquito control districts.

- A. Aerosol bombs
- B. Hand-carried dispersal units
- C. ULV spraying
- D. Aerosol foggers
- E. None of the Above

226. Mosquito control professionals apply pyrethroids as an \_\_\_\_\_ spray. Ultra-low volume (ULV) sprayers dispense very fine aerosol droplets that stay aloft and kill adult mosquitoes on contact.

- A. Golden Bear 1111
- B. Oils
- C. Ultra-low volume (ULV)
- D. Chlordane
- E. None of the Above

227. Pyrethroids used in mosquito control are typically mixed with a synergist compound, such as \_\_\_\_\_, which enhances the effectiveness of the active ingredient.

- A. Golden Bear 1111
- B. Piperonyl butoxide
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

228. The product is often diluted in water or oil and applied at rates \_\_\_\_\_ of a pound of active ingredient or less than 4 fluid ounces of mixed formulation per acre.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. In water
- D. Less than 1/100th
- E. None of the Above

Do Pyrethroids Pose Risks to Human Health?

229. Pyrethroids can be used for public health mosquito control programs without posing unreasonable \_\_\_\_\_ when applied according to the label.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to human health
- E. None of the Above

230. Pyrethroids are considered to pose \_\_\_\_\_ to humans, but at high doses, pyrethroids can affect the nervous system.

- A. Nontoxic
- B. Minimal acute and chronic
- C. Slight risks of acute toxicity
- D. Risks
- E. None of the Above

Do Pyrethroids Pose Risks to Wildlife or the Environment?

231. Pyrethroids used in mosquito control programs \_\_\_\_\_ risks to wildlife or the environment.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not pose unreasonable
- D. Risks to human health
- E. None of the Above

232. Pyrethroids, when applied at mosquito control rates, are low in toxicity to mammals, and are practically \_\_\_\_\_ to birds.

- A. Nontoxic
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to
- E. None of the Above

233. Mosquito control formulations of permethrin break down in the environment, and \_\_\_\_\_ and sunlight accelerate this process.

- A. Running waters
- B. High temperatures
- C. Stream breeders
- D. Cold weather
- E. None of the Above

234. Pyrethroids are \_\_\_\_\_ to fish and to bees. For this reason, the EPA has established specific precautions on the label to reduce such risks, including restrictions that prohibit the direct application of products to open water or within 100 feet of lakes, streams, rivers, or bays.

- A. Nontoxic
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Toxic
- E. None of the Above

*Anopheles* spp.

Of the insects that serve as vectors for parasitic diseases, this genus is arguably the most important.

235. Of the approximately \_\_\_\_\_ of *Anopheles*, about two dozen serve as vectors for malaria (*Plasmodium* spp.) in humans.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. 422 species
- D. 300
- E. None of the Above

236. There are about 422 species of *Anopheles* worldwide, many of them sibling species that can only be identified using genetic techniques. Of these, about \_\_\_\_\_ of the protozoan *Plasmodium* that causes malaria, but only about 40 are important.

- A. 100 to 500 larvae
- B. 70 are vectors
- C. All are virus
- D. 1 of 2
- E. None of the Above

237. Malaria infects \_\_\_\_\_ people and kills 1.5-2.7 million people each year, making it by far the most serious of the diseases spread by insects.

- A. 100 to 500
- B. 300-500 million
- C. 1 of two
- D. 5 billion
- E. None of the Above

238. *Culex pipiens*, the \_\_\_\_\_ has a distribution that roughly includes the northern half of the United States.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

239. The species is replaced by \_\_\_\_\_, the Southern House Mosquito, in the southern United States with limited overlap in portions of the Midwest.
- A. *Culex quinquefasciatus*
  - B. *Culex pipiens*
  - C. *Culex restuans*
  - D. Hibernating females
  - E. None of the Above
240. \_\_\_\_\_ provides the life cycle model for most of the domestic *Culex* in temperate areas.
- A. *Culex quinquefasciatus*
  - B. *Culex pipiens*
  - C. *Culex restuans*
  - D. Hibernating females
  - E. None of the Above
241. The \_\_\_\_\_ pass the winter in diapause and do not become active during periods of warm winter weather.
- A. *Culex quinquefasciatus*
  - B. *Culex pipiens*
  - C. *Culex restuans*
  - D. Females
  - E. None of the Above
242. \_\_\_\_\_ are common in basements, outbuildings, and subterranean enclosures.
- A. *Culex quinquefasciatus*
  - B. *Culex pipiens*
  - C. *Culex restuans*
  - D. Hibernating females
  - E. None of the Above
243. Like \_\_\_\_\_, the females congregate near moisture and move their resting location during the winter to remain in a humid atmosphere.
- A. *Culex quinquefasciatus*
  - B. *Culex pipiens*
  - C. *Culex restuans*
  - D. Hibernating females
  - E. None of the Above
244. Mortality can be extensive during periods of \_\_\_\_\_.
- A. *Culex quinquefasciatus*
  - B. *Culex pipiens*
  - C. *Culex restuans*
  - D. Winter drought
  - E. None of the Above
245. \_\_\_\_\_ emerge from hibernation during May and begin depositing egg rafts in suitable habitat.
- A. *Culex quinquefasciatus*
  - B. *Culex pipiens*
  - C. *Culex restuans*
  - D. Females
  - E. None of the Above

246. Populations of this mosquito usually peak during August, but \_\_\_\_\_ well into September.
- A. *Culex quinquefasciatus*
  - B. *Culex pipiens*
  - C. *Culex restuans*
  - D. Hibernating females
  - E. None of the Above
247. The adults from the \_\_\_\_\_ of the season lose all interest in blood meal hosts but will move in and out of overwintering sites during periods of mild fall weather.
- A. Last generation
  - B. Breeding habitats
  - C. Temporary ground water
  - D. Deposits its eggs
  - E. None of the Above
248. Larvae rarely persist in \_\_\_\_\_ after females have entered hibernation.
- A. Last generation
  - B. Breeding habitats
  - C. Temporary ground water
  - D. Deposits its eggs
  - E. None of the Above
249. \_\_\_\_\_ can be found in a fairly wide range of larval habitats, but are generally associated with water that has a high organic content.
- A. *Culex quinquefasciatus*
  - B. *Culex pipiens*
  - C. *Culex restuans*
  - D. Hibernating females
  - E. None of the Above
250. The species utilizes \_\_\_\_\_ that ranges from mildly to grossly polluted.
- A. Last generation
  - B. Breeding habitats
  - C. Temporary ground water
  - D. Deposits its eggs
  - E. None of the Above
251. The species also \_\_\_\_\_ in artificial containers, including tin cans, tires, and any refuse that allows stagnant water to puddle.
- A. Last generation
  - B. Breeding habitats
  - C. Temporary ground water
  - D. Deposits its eggs
  - E. None of the Above
252. The species is decidedly urban and reaches greatest numbers in large urban centers. Catch basins and storm drains provide ideal habitat for \_\_\_\_\_.
- A. *Culex quinquefasciatus*
  - B. *Culex pipiens*
  - C. *Culex restuans*
  - D. Hibernating females
  - E. None of the Above



253. \_\_\_\_\_ and slaughter house drainage ponds support high populations of this species.

- A. Meat packing plants
- B. Eastern seaboard
- C. Gulf Coast region
- D. Sumps on farms
- E. None of the Above

254. \_\_\_\_\_ can always be collected in the effluent from sewage treatment plants.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

#### Collection

255. No special techniques are required to collect \_\_\_\_\_ larvae. This species is common in urban settings and can usually be found in significant numbers in a variety of habitats where stagnant water collects.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

256. \_\_\_\_\_ will oviposit readily in buckets containing prepared straw infusions. Most piles of discarded tires contain a mixture of *Cx. pipiens* and *Cx. restuans* in addition to the tire-breeding *Aedes*.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

257. \_\_\_\_\_ occurs on every continent except Antarctica and is the most widely distributed mosquito in the world.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

258. In North America, two races range north (*Cx. pipiens pipiens*) and south (*Cx. pipiens quinquefasciatus*) of 39°N latitude, about the level of Sacramento. *Cx. p. pipiens* lives in the milder coastal climate areas, while *Cx. p. quinquefasciatus* is found in the \_\_\_\_\_.

- A. Meat packing plants
- B. Eastern seaboard
- C. Warmer inland valleys
- D. Sumps on farms
- E. None of the Above

259. \_\_\_\_\_ main host is wild birds, but it also feeds freely on a wide variety of warm-blooded vertebrates, including man.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

260. In northern California, it currently plays only a lesser role as a carrier of human disease, while in southern California and the \_\_\_\_\_, it is a major carrier of Saint Louis encephalitis.

- A. Meat packing plants
- B. Eastern seaboard
- C. Gulf Coast region
- D. Sumps on farms
- E. None of the Above

261. It is also the best known carrier of West Nile Virus, a severe encephalitis virus newly arrived in the Americas that is spreading along the \_\_\_\_\_.

- A. Meat packing plants
- B. Eastern seaboard
- C. Gulf Coast region
- D. Sumps on farms
- E. None of the Above

262. \_\_\_\_\_ is a serious pest, called the "house mosquito" because it commonly develops in small containers around the home.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

263. It shows great skill in finding ways to get into the house, where it feeds on the occupants at night. It also occurs in containers and \_\_\_\_\_ and industrial plants, in polluted waters, and will feed out-of-doors at night.

- A. Meat packing plants
- B. Eastern seaboard
- C. Gulf Coast region
- D. Sumps on farms
- E. None of the Above

264. \_\_\_\_\_ larvae typically develop best in dirty, stagnant water containing abundant organic matter, in ground pools and natural and man-made containers.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

265. Vector technicians often find improperly installed or maintained \_\_\_\_\_ producing huge numbers of this species.

- A. Meat packing plants
- B. Eastern seaboard
- C. Gulf Coast region
- D. Underground septic tanks
- E. None of the Above

266. The mosquitoes gain entrance thorough \_\_\_\_\_, through poorly fitting or unsealed covers, or by the vent pipes made for removal of gases.

- A. Meat packing plants
- B. Eastern seaboard
- C. Cracks in the ground
- D. Sumps on farms
- E. None of the Above

267. Most larval samples from \_\_\_\_\_ consist mainly of Cx. pipiens and Cx restuans.

- A. Meat packing plants
- B. Eastern seaboard
- C. Polluted water sources
- D. Sumps on farms
- E. None of the Above

Where does this Mosquito normally lay its Eggs?

268. In tin cans, buckets, discarded tires and other artificial containers that \_\_\_\_\_.

- A. Discerned with practice
- B. Hold stagnant water
- C. Build body fat
- D. State of torpor
- E. None of the Above

269. In untended bird baths, clogged rain gutters and plastic wading pools that \_\_\_\_\_.

- A. Discerned with practice
- B. Hold stagnant water
- C. Build body fat
- D. State of torpor
- E. None of the Above

270. \_\_\_\_\_ will be accomplished by requiring decontamination supplies and emergency assistance.

- A. Notifying workers
- B. Mitigate exposures
- C. Requiring safety training
- D. Very complicated
- E. None of the Above

271. Pesticide safety training — for \_\_\_\_\_.

- A. Specific directions not to enter during the REI.
- B. Exposure to pesticides
- C. REI or WPS
- D. Workers and handlers
- E. None of the Above

272. Pesticide safety poster — to be displayed for \_\_\_\_\_.

- A. Specific directions not to enter during the REI.
- B. Exposure to pesticides
- C. REI or WPS
- D. Workers and handlers
- E. None of the Above

273. Access to labeling information — for pesticide handlers and early-entry \_\_\_\_\_.

- A. Specific directions not to enter during the REI.
- B. Exposure to pesticides
- C. REI or WPS
- D. Workers
- E. None of the Above

274. \_\_\_\_\_— centrally located application information of pesticide treatments on the establishment.

- A. Access to specific information
- B. Exposures to pesticides
- C. Avoid inadvertent exposures
- D. Mitigate pesticide exposures
- E. None of the Above

#### PROTECTION

275. To ensure that employees will be \_\_\_\_\_, the WPS requires employers to: Prohibit handlers from applying a pesticide in a way that will expose workers or other persons.

- A. Protected from exposures to pesticides
- B. Exposures to pesticides
- C. Avoid inadvertent exposures
- D. Mitigate pesticide exposures
- E. None of the Above

276. \_\_\_\_\_ from areas being treated with pesticides.

- A. Access to specific information
- B. Exposures to pesticides
- C. Avoid inadvertent exposures
- D. Exclude workers
- E. None of the Above

277. \_\_\_\_\_ from areas that remain under a restricted-entry interval (REI), with narrow exceptions.

- A. Access to specific information
- B. Exclude workers
- C. Avoid inadvertent exposures
- D. Mitigate pesticide exposures
- E. None of the Above

278. \_\_\_\_\_ who are doing permitted tasks in treated areas during an REI, including special instructions and duties related to correct use of PPE.

- A. Access to specific information
- B. Exposures to pesticides
- C. Avoid inadvertent exposures
- D. Protect early-entry workers
- E. None of the Above

279. Notify workers about treated areas so they can \_\_\_\_\_.

- A. Access to specific information
- B. Exposures to pesticides
- C. Avoid inadvertent exposures
- D. Avoid inadvertent exposures
- E. None of the Above

280. Protect handlers during handling tasks, including \_\_\_\_\_ pesticides, and duties related to correct use of PPE.

- A. Access to specific information
- B. Monitoring while handling highly toxic
- C. Avoid inadvertent exposures
- D. Mitigate pesticide exposures
- E. None of the Above

281. These key terms have \_\_\_\_\_ in the WPS. Note that these definitions may be different from definitions found in other state and federal laws and regulations.

- A. Access to specific information
- B. Exposures to pesticides
- C. Very specific meanings
- D. Mitigate pesticide exposures
- E. None of the Above

#### MITIGATION

282. To \_\_\_\_\_ that employees receive, the WPS requires:

- A. Access to specific information
- B. Exposures to pesticides
- C. Avoid inadvertent exposures
- D. Mitigate pesticide exposures
- E. None of the Above

283. Decontamination supplies — providing handlers and workers an ample supply of water, soap, and towels for routine washing and \_\_\_\_\_.

- A. Poisoned or injured
- B. You are affected
- C. Specific meanings
- D. Emergency decontamination
- E. None of the Above

284. Emergency assistance — making transportation available to a medical care facility if an agricultural worker or handler may have been \_\_\_\_\_ by a pesticide, and providing information about the pesticide(s) to which the person may have been exposed.

- A. Poisoned or injured
- B. You are affected
- C. Specific meanings
- D. Emergency decontamination
- E. None of the Above

285. These key terms have very \_\_\_\_\_ in the WPS. Note that these definitions may be different from definitions found in other state and federal laws and regulations.

- A. Poisoned or injured
- B. You are affected
- C. Specific meanings
- D. Emergency decontamination
- E. None of the Above

#### Terms You Need to Know

These definitions will help you determine whether you are affected by the Worker Protection Standard.

286. \_\_\_\_\_: Plants grown or maintained for commercial or research purposes. Examples: food, feed, and fiber plants, trees, turfgrass, flowers, shrubs, ornamentals, and seedlings.

- A. Farms
- B. Agricultural plants
- C. Nurseries
- D. Greenhouses
- E. None of the Above

287. \_\_\_\_\_: Operations, other than nurseries or forests, that produce agricultural plants outdoors.

- A. Farms
- B. Agricultural plants
- C. Nurseries
- D. Greenhouses
- E. None of the Above

288. \_\_\_\_\_: Operations that produce agricultural plants outdoors for wood fiber or timber products.

- A. Farms
- B. Agricultural plants
- C. Forests
- D. Greenhouses
- E. None of the Above

289. \_\_\_\_\_: Operations that produce agricultural plants indoors in an area that is enclosed with nonporous covering and that is large enough to allow a person to enter.

- A. Farms
- B. Agricultural plants
- C. Nurseries
- D. Greenhouses
- E. None of the Above

290. "\_\_\_\_\_" means any person who is assessing pest numbers or damage, pesticide distribution, or the status, condition, or requirements of agricultural plants. Examples include crop consultants and scouts.

- A. Crop advisor
- B. Agricultural laborers
- C. Pesticide handlers
- D. Worker and an employer of workers
- E. None of the Above

291. If you are in any of these categories, you must comply with the Environmental Protection Agency's \_\_\_\_\_ Protection Standard (40 CFR, part 170) including all revisions through 2004.

- A. Crop advisor
- B. Agricultural laborers
- C. Pesticide handlers
- D. Worker
- E. None of the Above

292. Under the WPS, you may be both a \_\_\_\_\_.

- A. Crop advisor
- B. Agricultural laborers
- C. Pesticide handlers
- D. Worker and an employer of workers
- E. None of the Above

293. Under the WPS, you may be both a handler and a(n) \_\_\_\_\_ of handlers.

- A. Crop advisor
- B. Agricultural laborers
- C. Pesticide handlers
- D. Employer
- E. None of the Above

#### WHO DOES THE WPS PROTECT?

294. The WPS requires employers to take steps to protect two types of agricultural employees: workers and \_\_\_\_\_.

- A. Pesticide handlers
- B. Assisting with the application of pesticides
- C. Worker
- D. None of the Above

295. The terms "\_\_\_\_\_ " and "pesticide handler" are defined very specifically in the WPS, and employers of persons who meet these definitions must comply with the WPS.

- A. Pesticide handler
- B. Assisting with the application of pesticides
- C. Worker
- D. Immediate family
- E. None of the Above

296. Depending on the tasks being performed, you may need to provide the same employee with worker protections on some occasions and \_\_\_\_\_protections on other occasions.

- A. Pesticide handler
- B. Assisting with the application of pesticides
- C. Worker
- D. Immediate family
- E. None of the Above

297. Owners of agricultural establishments and members of their \_\_\_\_\_ are exempt from many WPS requirements.

- A. Pesticide handler
- B. Assisting with the application of pesticides
- C. Worker
- D. Immediate family
- E. None of the Above

#### WORKERS

298. A worker is anyone who: (1) is employed (\_\_\_\_\_) for any type of compensation and (2) is doing tasks, such as harvesting, weeding, or watering, relating to the production of agricultural plants on a farm, forest, nursery, or greenhouse. This term does not include persons who are employed by a commercial establishment to perform tasks as crop advisors.

- A. Pesticide handler
- B. Assisting with the application of pesticides
- C. Worker
- D. Immediate family
- E. None of the Above

#### PESTICIDE HANDLERS

299. A pesticide handler is anyone who: (1) is employed (\_\_\_\_\_) for any type of compensation by an agricultural establishment or a commercial pesticide handling establishment that uses pesticides in the production of agricultural plants on a farm, forest, nursery, or greenhouse, and (2) is doing any of the following tasks: mixing, loading, transferring, or applying pesticides, handling opened containers of pesticides, acting as a flagger.

- A. Pesticide handler
- B. Assisting with the application of pesticides
- C. Worker
- D. Immediate family
- E. None of the Above

#### Personal Protective Equipment

300. Any person handling a pesticide must use the clothing and \_\_\_\_\_ specified on the label for product use.

- A. PPE
- B. Decontamination site
- C. Equipment
- D. Product labeling
- E. None of the Above

You are finished with your assignment. Please fax, mail or e-mail your assignment along with your registration form and survey sheet. Always call later to ensure we've received the assignment.

Fax (928) 272-0747 E-mail [info@tlch2o.com](mailto:info@tlch2o.com)

Fax a copy of your driver's license too.



## Mosquito Control CEU Training Awareness Assignment #4 Last Names Q to R

You will have 90 days from the start of this course to have successfully passed this assignment with a score of 70 %. You may e mail the answers to TLC, info@tlch2o.com or fax the answers to TLC, (928) 272-0747. This assignment is available to you in a Word Format on TLC's Website. You can find online assistance for this course on the in the Search function on Adobe Acrobat PDF to help find the answers. Once you have paid the course fee, you will be provided complete course support from Student Services (928) 468-0665.

Assignment #1 for all pest applicators whose names start with the letter A- E.

Assignment #2 for all pest applicators whose last names start with F-K.

Assignment #3 for all pest applicators whose last name starts with the letter L-P.

Assignment #4 for all pest applicators whose last name starts with the letter Q-R.

Assignment #5 for all pest applicators whose last name starts with the letter S-Z.

### Multiple Choice Section, One answer per question and please use the answer key.

1. Feeding females assume a(n) \_\_\_\_\_ with their abdomen pointed high in the air.

- A. Highest ranking
- B. Calling
- C. Active nest
- D. Distinctive pose
- E. None of the Above

2. Western \_\_\_\_\_ mosquitoes occur west of the Rocky Mountains, between southern Canada and northern Mexico, and from sea level to about 6,000 ft. elevation.

- A. And Southern
- B. Malaria
- C. Canadian
- D. House
- E. None of the Above

3. The larvae prefer clear, clean water, in sunlit or partially shaded streams or ponds. They occur abundantly in both Marin and Sonoma counties, but their highest density is found in the irrigated and seasonally flooded rice fields of the great central valley, historically the region of California's \_\_\_\_\_.

- A. Highest malaria infection rates
- B. Malaria vector section
- C. Active infections
- D. Wetlands
- E. None of the Above

4. Adults migrate in the spring and fall, but most stay within five miles of their larval sites. Like most Anopheles, they are \_\_\_\_\_, and find shelter in hidden places during the day.

- A. Active during the hours of darkness
- B. Carriers of the vector
- C. Active
- D. Aggressive
- E. None of the Above

5. Females feed mainly on medium to large mammals like rabbits, deer, cattle or horses, and they pursue and \_\_\_\_\_.

- A. Lay their eggs
- B. All carry the Malaria vector
- C. Possess active infections
- D. Bite man aggressively
- E. None of the Above

*Culex tarsalis*

6. *Culex tarsalis* is \_\_\_\_\_ in North America west of the Mississippi River, between southern Canada and northern Mexico.

- A. A rapid producer
- B. Kept under control
- C. Widely distributed
- D. Especially favorable
- E. None of the Above

7. It primarily occurs throughout California, from sea level up to nearly 10,000 in feet elevation, and is \_\_\_\_\_ in the Central Valley and coastal regions, including Marin and Sonoma Counties.

- A. Rare
- B. Not a threat
- C. Especially abundant
- D. Especially hostile
- E. None of the Above

8. As its name suggests, *C. tarsalis* has bands of \_\_\_\_\_ around the joints of its tarsi (legs).

- A. Orange strips
- B. Red
- C. White scales
- D. Green spots
- E. None of the Above

9. There is also a pale band around the center of the proboscis, a line of white scales extending along the hind tibia and femur, and a \_\_\_\_\_ made of dark scales on the underside of each abdominal segment.

- A. Stinger
- B. Shield
- C. Series of V-shaped spots
- D. Set of prolegs
- E. None of the Above

10. This mosquito develops \_\_\_\_\_ multiple generations. In the hot summer season, egg to adult development occurs in as few as four to ten days.

- A. Rapidly and produces
- B. Several
- C. A series of
- D. Quickly
- E. None of the Above

11. A female can lay six or seven times, with some \_\_\_\_\_ in a batch. Without control efforts, local populations can reach huge numbers in a short time.
- A. 100 to 500 larvae
  - B. Broods maybe 3 to 4
  - C. With out water
  - D. 300 eggs
  - E. None of the Above
12. *Culex tarsalis* breeds in nearly every freshwater source except treeholes. Larvae are found in all but the most \_\_\_\_\_.
- A. In Wetlands
  - B. Polluted ground pools
  - C. Dry areas
  - D. Especially favorable environments
  - E. None of the Above
13. Summer agricultural irrigation produces an especially \_\_\_\_\_, with highest population densities coinciding with the months of most intense irrigation.
- A. Favorable environment
  - B. At night
  - C. Series of nests
  - D. During full moons
  - E. None of the Above
14. During the daytime, adults \_\_\_\_\_, animal burrows, and artificial habitats like barns, chicken houses, and culverts. In most areas, they feed equally on birds and mammals, including man, depending on availability.
- A. Sleep on rooftops
  - B. Rest in tree cavities
  - C. Mate and live
  - D. Feed
  - E. None of the Above
15. After years of intense efforts to \_\_\_\_\_, vast populations in the central valley have become resistant to nearly all the common chemical insecticides.
- A. Avoid them
  - B. Keep them under control
  - C. Spray them
  - D. None of the Above
16. *Culex tarsalis* is the most important carrier of western equine and Saint Louis encephalitis in much of the western U.S. It occurs together with wild birds - the natural reservoir of infection, and the virus is often discovered in \_\_\_\_\_.
- A. After bites
  - B. Laboratories
  - C. Field-collected specimens
  - D. Homes
  - E. None of the Above

17. It is also readily infected after taking an infected blood meal, and \_\_\_\_\_ the virus during its later blood meals.

- A. Rapidly produces
- B. Easily transmits
- C. Moves
- D. Mosquito flies with
- E. None of the Above

18. The appearance of antibodies against encephalitis virus in the flocks of sentinel chickens kept in several parts of the state is a signal alarm to the districts to begin \_\_\_\_\_ reducing *Culex tarsalis* numbers around populated areas.

- A. Rapidly
- B. Quickly and aggressively
- C. To assist in
- D. Up starting and
- E. None of the Above

19. Mosquitoes of the *Culex tarsalis* species have a \_\_\_\_\_.

- A. Long life
- B. Set of black wings
- C. Series of V-shaped spots
- D. Distinct ring around the proboscis
- E. None of the Above

Short Range Attractants

20. Once they have landed, they rely on a number of \_\_\_\_\_ attractants to determine if we are an acceptable blood meal host.

- A. Colors
- B. Short-range
- C. Attractive
- D. Odor
- E. None of the Above

21. Folic acid is one chemical that appears to be particularly important. Fragrances from hair sprays, perfumes, deodorants, and soap can cover these chemical cues. They can also function to either enhance or \_\_\_\_\_ the host-seeking drive.

- A. Colors
- B. View
- C. Attract
- D. Repel
- E. None of the Above

22. Dark colors capture \_\_\_\_\_ and make most people more attractive to mosquitoes.

- A. Colors
- B. Heat
- C. Odors
- D. Females
- E. None of the Above

23. Light \_\_\_\_\_ refract heat and are generally less attractive to mosquitoes.  
A. Colors  
B. Will not  
C. Attracts  
D. and water  
E. None of the Above

24. Detergents, fabric softeners, perfumes and body odor can counteract the effects of color. In most cases, only the mosquito knows why one person is more \_\_\_\_\_ than another.  
A. Colorful  
B. Shorter  
C. Attractive  
D. Quicker  
E. None of the Above

How Long do Mosquitoes Live?

25. Mosquitoes are relatively \_\_\_\_\_ insects with an adult life span that lasts about 2 weeks.  
A. Strong  
B. Fragile  
C. Attractive  
D. Short  
E. None of the Above

26. The vast majority meet a \_\_\_\_\_ by serving as food for birds, dragonflies, and spiders, or are killed by the effects of wind, rain or drought.  
A. Blood host  
B. Short-range goal  
C. Mate  
D. Violent end  
E. None of the Above

27. The mosquito species that only have a single generation each year are longer lived and may persist in \_\_\_\_\_ numbers for as long as 2-3 months if environmental conditions are favorable.  
A. Large  
B. Short-range  
C. Small  
D. All of the above  
E. None of the Above

28. Mosquitoes that \_\_\_\_\_ in the adult stage live for 6-8 months, but spend most of that time in a state of torpor.  
A. The life cycle  
B. Hibernate  
C. Produce saliva  
D. Have penetration  
E. None of the Above

29. Some of the mosquito species found in arctic regions enter hibernation twice and take more than a year to complete their \_\_\_\_\_.
- A. Life cycle
  - B. Blood feast
  - C. Mating
  - D. None of the Above

What Happens When Mosquitoes Bite?

30. The saliva makes \_\_\_\_\_ easier and prevents the blood from clotting in the narrow channel of her food canal.

- A. Life cycle
- B. Nesting
- C. Bites
- D. Penetration
- E. None of the Above

31. The welts that appear after the mosquito leaves is not a reaction to the wound but a(n) \_\_\_\_\_ reaction to the saliva injected to prevent clotting. In most cases, the itching sensation and swellings subside within several hours.

- A. Negative
- B. Blood
- C. Saliva
- D. Allergic
- E. None of the Above

32. Some people are highly sensitive and symptoms persist for several days. Scratching the bites can result in infection if \_\_\_\_\_ from the fingernails are introduced to the wounds.

- A. The dirt
- B. Bacteria
- C. The saliva
- D. The infection
- E. None of the Above

33. Where do mosquitoes go in the winter?

Mosquitoes, like most insects, are \_\_\_\_\_ creatures. As a result, they are incapable of regulating body heat, and their temperature is essentially the same as their surroundings.

- A. Driven
- B. Adaptable
- C. Flying
- D. Cold-blooded
- E. None of the Above

34. Mosquitoes function best at 80°F, become \_\_\_\_\_ at 60°F and cannot function below 50°F.

- A. Lethargic
- B. Active
- C. Ready to mate
- D. Nuisance
- E. None of the Above

Mosquito Life Cycle

35. The type of standing water in which the mosquito chooses to lay her eggs depends upon the \_\_\_\_\_.

- A. Life cycle
- B. Blood
- C. Species
- D. Weather
- E. None of the Above

36. The presence of beneficial predators such as \_\_\_\_\_ nymphs in permanent ponds, lakes, and streams usually keep these bodies of water relatively free of mosquito larvae.

- A. Insect
- B. Fish and dragonfly
- C. Mosquito
- D. None of the Above

37. Portions of marshes, swamps, clogged ditches, and temporary pools and puddles are all \_\_\_\_\_ mosquito breeding sites.

- A. Part of the life cycle and
- B. Attractive to
- C. Prolific
- D. None of the Above

38. Other sites in which some species lay their eggs include \_\_\_\_\_ such as old tires, buckets, toys, potted plant trays, and saucers and plastic covers or tarpaulins.

- A. Tree holes and containers
- B. Annoying and potentially dangerous areas
- C. Unique areas
- D. Grasslands
- E. None of the Above

39. Some of the most \_\_\_\_\_ mosquito species, such as the Asian tiger mosquito, come from these sites.

- A. Foreign
- B. Annoying and potentially dangerous
- C. Unique
- D. Malaria
- E. None of the Above

Wrigglers and Tumblers

40. The mosquitoes in the United States, all of which live in specific habitats, exhibit \_\_\_\_\_ different types of animals. Despite these differences, all mosquitoes share some common traits, such as a four-stage life cycle.

- A. Potentially dangerous traits as
- B. Annoying habits
- C. Unique behaviors and bite
- D. Intelligence
- E. None of the Above

41. After the female mosquito obtains a blood meal (male mosquitoes do not bite), she lays her eggs directly on the surface of stagnant water, in a depression, or on the edge of a container where rainwater may \_\_\_\_\_ the eggs.
- A. Support
  - B. Annoy
  - C. Moisten
  - D. Collect and flood
  - E. None of the Above
42. The \_\_\_\_\_ and a mosquito larva or "wiggler" emerges.
- A. Holes and containers make great homes
  - B. Eggs spread
  - C. Eggs support
  - D. Eggs hatch
  - E. None of the Above
43. The larva lives in the water, feeds, and develops into the third stage of the life cycle called a pupa or "tumbler". The pupa also \_\_\_\_\_, but no longer feeds.
- A. Looks like the adult
  - B. Lives in the water
  - C. Has unique behaviors and bites
  - D. None of the Above
44. Finally, the mosquito emerges from the pupal case and the water as a(n) \_\_\_\_\_, ready to bite.
- A. Fully developed adult female
  - B. Annoying and potentially dangerous pest
  - C. Breeder
  - D. Collector
  - E. None of the Above
45. Mosquitoes may overwinter as, \_\_\_\_\_. Eggs, larvae, and pupae must have water to develop.
- A. Eggs fertilized adult females or larvae
  - B. People goes indoors
  - C. It gets cold
  - D. To collect and feed
  - E. None of the Above
46. Some female mosquitoes lay their eggs \_\_\_\_\_.
- A. In the Winter
  - B. In Dry areas
  - C. In Trees
  - D. Directly on the water surface
  - E. None of the Above
47. Others lay their eggs on substrates above the water line (flood pool mosquitoes); \_\_\_\_\_. In some cases, the eggs will remain viable for several years until further flooding occurs.
- A. These are not a threat
  - B. And most do not
  - C. The eggs hatch upon flooding
  - D. Collect and flood
  - E. None of the Above



48. Mosquitoes belonging to the genus \_\_\_\_\_ lay their eggs in bunches or "rafts."  
A. Culex  
B. Aedes  
C. Anopheles  
D. Ochlerotatus  
E. None of the Above
49. Each raft may contain up to 400 individual eggs. \_\_\_\_\_ feed on bits of organic matter dispersed in the water, becoming full grown in about one week. The pupal stage lasts two to three days.  
A. Adults  
B. Larvae  
C. Female  
D. Male  
E. None of the Above
50. \_\_\_\_\_ mosquitoes are ready to bite one to two days after adult emergence.  
A. Pupal  
B. Larvae  
C. Female  
D. Male  
E. None of the Above
51. \_\_\_\_\_ mosquitoes do not bite but feed on flower nectar or plant juices.  
A. Most  
B. Larvae  
C. Female  
D. Male  
E. None of the Above
52. \_\_\_\_\_ may fly 5 to 10 miles, but usually rest in grass, shrubbery, or other foliage close to the water breeding area.  
A. Pupals  
B. Larvae  
C. Adults  
D. Males  
E. None of the Above

#### Mosquito Habitats

53. Few mosquito species in the U.S. breed in \_\_\_\_\_, such as streams.  
A. Running waters  
B. Springs  
C. Streams  
D. Along banks  
E. None of the Above
54. Larvae can be flushed out when \_\_\_\_\_ increases, and to remain in the stream requires a large amount of energy.  
A. Running waters  
B. Stream volume  
C. Stream breeders  
D. Energy  
E. None of the Above

55. The tropical genus *Chagasia* and some *Anopheles* species are \_\_\_\_\_. In addition, *Anopheles quadrimaculatus*, *Culex territans*, and *Uranotaenia sapphirina* have all been found in streams, although they prefer other habitats.

- A. Running waters
- B. Hostile
- C. Stream breeders
- D. Prolific
- E. None of the Above

56. Stream breeders will find vegetation \_\_\_\_\_ with which to anchor themselves or attempt to remain away from the main flow of the stream by seeking isolated eddies.

- A. Nests
- B. To make mating sites
- C. Strongholds
- D. Along banks
- E. None of the Above

57. Transient water sources, such as \_\_\_\_\_, snowpools, and ditches, are used as breeding grounds for mosquito species whose eggs can withstand desiccation, such as *Aedes* and *Psorophora*.

- A. Running waters
- B. Streams
- C. Springs
- D. Flooded areas
- E. None of the Above

58. Their life cycles require alternating periods of wet and dry. Other species, like an opportunistic *Culex*, might be able to pull off a single generation during an extended \_\_\_\_\_.

- A. Dry season
- B. Life time
- C. Flooded period
- D. Credit
- E. None of the Above

59. \_\_\_\_\_ generally shows water quality changes which result in various mosquito species using the same pool over a period of time.

- A. Running waters
- B. Transient water
- C. Stream breeders
- D. Fresh water
- E. None of the Above

60. Genera associated with \_\_\_\_\_ are *Anopheles*, *Culex*, *Culiseta*, *Coquillettidia*, and *Uranotaenia*.

- A. Running waters
- B. Transient water
- C. Stream breeders
- D. Permanent water
- E. None of the Above

61. Eggs of these species are not desiccant-resistant and must be laid directly \_\_\_\_\_.
- A. In running waters
  - B. On the water
  - C. Stream breeders
  - D. Along banks
  - E. None of the Above

62. As with transient waters, there is a seasonal change in the vegetation, \_\_\_\_\_, and mosquito species present.
- A. Water quality
  - B. Stream volume
  - C. Breeders
  - D. Enemies
  - E. None of the Above

63. Culiseta are found in \_\_\_\_\_ formed by pockets of water surrounding tree roots.
- A. Running waters
  - B. Nests
  - C. Crypts
  - D. Along banks
  - E. None of the Above

Containers

64. \_\_\_\_\_ sites generally have tannin-enriched water, which is characteristically clear, with rotting wood at the bottom.
- A. Treehole
  - B. Insulation
  - C. Nesting
  - D. Artificial
  - E. None of the Above

65. Many \_\_\_\_\_ species now also use artificial sites, such as tires, since they provide insulation against the weather and are more numerous.
- A. Treehole
  - B. Mosquito
  - C. North American
  - D. Tropical
  - E. None of the Above

66. Artificial \_\_\_\_\_ are a convenient mode of transporting a species of mosquito outside of its natural range.
- A. Insemination
  - B. Insulation
  - C. Containers
  - D. Life sources
  - E. None of the Above

Mosquito Control Section

67. The mission of the Environmental Protection Agency (EPA) is to \_\_\_\_\_ and the environment.

- A. Protect human health
- B. Minimize the risk of human exposure
- C. Conduct surveillance for diseases
- D. Evaluating larval populations
- E. None of the Above

68. The EPA reviews and approves pesticides and their labeling to ensure that the pesticides used to protect public health are applied by methods which \_\_\_\_\_ and adverse health and environmental effects.

- A. Protect human health
- B. Minimize the risk of human exposure
- C. Conduct surveillance for diseases
- D. Evaluating larval populations
- E. None of the Above

69. The first step in mosquito control is surveillance. Mosquito specialists \_\_\_\_\_ harbored by domestic and nonnative birds, including sentinel chickens (used as virus transmission indicators), and mosquitoes.

- A. Protect human health
- B. Minimize the risk of human exposure
- C. Conduct surveillance for diseases
- D. None of the Above

70. Surveillance for larval habitats is conducted by using maps and aerial photographs, and by \_\_\_\_\_.

- A. Protecting human health
- B. Minimizing the risk of human exposure
- C. Conducting surveillance for diseases
- D. Evaluating larval populations
- E. None of the Above

71. Other techniques include various light traps, biting counts, and \_\_\_\_\_.

- A. Protecting human health
- B. Minimizing the risk of human exposure
- C. Analysis of reports from the public
- D. Evaluating larval populations
- E. None of the Above

72. Mosquito control programs also put high priority on trying to \_\_\_\_\_, so that additional controls may not be necessary.

- A. Protect human health
- B. Minimize the risk of human exposure
- C. Conduct surveillance for diseases
- D. Prevent a large population of adult mosquitoes from developing
- E. None of the Above

73. Since mosquitoes must have water to breed, methods of prevention may include controlling water levels in lakes, marshes, ditches, or other mosquito breeding sites, \_\_\_\_\_ if possible, and stocking bodies of water with fish species that feed on larvae.

- A. Eliminating small breeding sites
- B. Minimize the risk of human exposure
- C. Conduct surveillance for diseases
- D. Evaluating larval populations
- E. None of the Above

74. Both chemical and biological measures may be employed to \_\_\_\_\_ during larval stages.

- A. Protect human health
- B. Minimize the risk of human exposure
- C. Conduct surveillance for diseases
- D. Kill immature mosquitoes
- E. None of the Above

Larvicides

75. \_\_\_\_\_ target larvae in the breeding habitat before they can mature into adult mosquitoes and disperse.

- A. Larvicides
- B. Mineral oils
- C. Liquids
- D. Mosquito controllers
- E. None of the Above

76. \_\_\_\_\_ include the bacterial insecticides *Bacillus thuringiensis israelensis* and *Bacillus sphaericus*, the insect growth inhibitor methoprene, and the organophosphate insecticide temephos.

- A. Larvicides
- B. Mineral oils
- C. Liquids
- D. Mosquito controllers
- E. None of the Above

77. \_\_\_\_\_ and other materials form a thin film on the surface of the water, which cause larvae and pupae to drown.

- A. Larvicides
- B. Mineral oils
- C. Liquids
- D. Mosquito controllers
- E. None of the Above

78. \_\_\_\_\_ larvicide products are applied directly to water using backpack sprayers and truck or aircraft-mounted sprayers. Tablet, pellet, granular, and briquette formulations of larvicides are also applied by mosquito controllers to breeding areas.

- A. Larvicides
- B. Mineral oils
- C. Liquid
- D. Mosquito controllers
- E. None of the Above

Methoprene (Altosid XR)

79. Methoprene (Altosid XR) is another safe material for control of mosquito larvae. It is an insect hormone that \_\_\_\_\_ of larvae (disrupts molting) and prevents mosquitoes from developing into adults.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. Will work in 150 days of uninterrupted mosquito control
- D. Are labeled for use in known fish habitats
- E. None of the Above

Altosid XR Briquettes

80. Altosid XR Briquettes \_\_\_\_\_. Treat swamps, ponds, and marsh areas in early spring before thawing.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. Will provide 150 days of uninterrupted mosquito control
- D. Are labeled for use in known fish habitats
- E. None of the Above

81. These extended-release briquettes will provide up to \_\_\_\_\_ once they hit the water.

- A. Development
- B. Season-long control
- C. 150 days of uninterrupted mosquito control
- D. Labeled for use in known fish habitats
- E. None of the Above

82. They can be applied by hand and the product is \_\_\_\_\_.

- A. Good for retarding the development
- B. Placed even on ice for season-long control
- C. Good for 150 days of uninterrupted mosquito control
- D. Labeled for use in known fish habitats
- E. None of the Above

Microbial insecticides

83. The product known as Bti (*Bacillus thuringiensis israeliensis*) can be as effective as chemical insecticides. When the bacteria Bti encysts, \_\_\_\_\_.

- A. It retards the development
- B. It can be placed even on ice for season-long control
- C. It produces a protein crystal toxic to mosquito and midge larvae
- D. It is labeled for use in known fish habitats
- E. None of the Above

84. Once the bacterium has been ingested, \_\_\_\_\_. It has no effect on a vast array of other aquatic organisms except midges in the same habitat. Bti strains are sold under the names Bactimos, Teknar and Vectobac.

- A. It retards the development
- B. It can be placed even on ice for season-long control
- C. It takes 150 days of uninterrupted mosquito control
- D. The toxin disrupts the lining of the larvae's intestine
- E. None of the Above

Mosquito Dunks or Briquettes

85. Product Description: \_\_\_\_\_ objects that release bacteria into water where mosquitoes are breeding. When the larvae feed on the bacteria, they die.

- A. Small donut shaped and sized
- B. Are long control
- C. Are well-known
- D. Are labeled for use in known fish habitats
- E. None of the Above

Juvenile Hormone

86. Methoprene (sold under the name Altosid) is an insect growth regulator widely used by abatement districts to \_\_\_\_\_.

- A. Control the development
- B. Control all season-long
- C. Control mosquito larvae
- D. Control fish habitats
- E. None of the Above

87. Methoprene \_\_\_\_\_, and when present in the larval habitat, it keeps immature insects from maturing into adults.

- A. Will retard the development
- B. Can be placed even on ice for season-long control
- C. Mimics a natural juvenile hormone
- D. Is labeled for use in known fish habitats
- E. None of the Above

88. Unable to metamorphose, the mosquitoes \_\_\_\_\_.

- A. Leave
- B. Hibernate
- C. Die in the pupal stage
- D. Mate
- E. None of the Above

89. Vector control technicians sometimes use methoprene to reach larval sources that would \_\_\_\_.

- A. Retard the development
- B. Can be placed even on ice for season-long control
- C. Otherwise be difficult or dangerous to treat
- D. Be permissible for use in known fish habitats
- E. None of the Above

If you are not a California Applicator and find a California Specific Question on your Assignment, please ignore the question and circle the question number. Skip the question if it is about the California law and you are not a California applicator.

90. Pellets \_\_\_\_\_ into underground septic tanks known to be breeding house mosquitoes.
- A. Are good and should be placed
  - B. Can be placed even on ice for season-long control
  - C. Are good for 150 days of uninterrupted mosquito control and thrown
  - D. Can be flushed down toilets
  - E. None of the Above
91. The methoprene kills the mosquitoes without upsetting the septic system's \_\_\_\_\_.
- A. Development
  - B. Control
  - C. Owner
  - D. Bacterial digestive processes
  - E. None of the Above

#### Larvicidal Oils

92. Oils have been used for mosquito control for more than a century. The Marin / Sonoma District in California uses \_\_\_\_\_, a light-viscosity oil that spreads quickly and evenly over the water surface, preventing larvae and pupae from obtaining oxygen through the surface film.
- A. Golden Bear 1111
  - B. Oils
  - C. Chlorinated hydrocarbons
  - D. Chlordane
  - E. None of the Above
93. \_\_\_\_\_ have always been used as a product of last resort for the control of mosquito pupae, since this stage does not feed but does require oxygen. The only other option would be draining the source.
- A. Golden Bear 1111
  - B. Oils
  - C. Chlorinated hydrocarbons
  - D. Chlordane
  - E. None of the Above

#### Chemical Larvicides

94. Chlorinated hydrocarbons like DDT and \_\_\_\_\_ are very much a thing of the past, as are the use of organophosphate and carbamate insecticides.
- A. Golden Bear 1111
  - B. Oils
  - C. Chlorinated hydrocarbons
  - D. Chlordane
  - E. None of the Above
95. \_\_\_\_\_ were removed from the US market in 1964, and in 1987.
- A. Golden Bear 1111
  - B. Oils
  - C. Chlorinated hydrocarbons
  - D. Chlordane
  - E. None of the Above



Adulticides

96. \_\_\_\_\_ control may be undertaken to combat an outbreak of mosquito-borne disease or a very heavy nuisance infestation of mosquitoes in a community.
- A. Golden Bear 1111
  - B. Oils
  - C. Chlorinated hydrocarbons
  - D. Chlordane
  - E. None of the Above
97. Pesticides registered for this use are \_\_\_\_\_ and are applied either by aircraft or on the ground, employing truck-mounted sprayers.
- A. Golden Bear 1111
  - B. Oils
  - C. Lavicides
  - D. Adulticides
  - E. None of the Above
98. State and local agencies commonly use the \_\_\_\_\_ Malathion and Naled and the synthetic pyrethroid insecticides Permethrin, Resmethrin, and Sumithrin for adult mosquito control.
- A. Golden Bear 1111
  - B. Oils
  - C. Organophosphate insecticides
  - D. Chlordane
  - E. None of the Above
99. Mosquito adulticides are applied as \_\_\_\_\_ sprays. Ultra-low volume (ULV) sprayers dispense very fine aerosol droplets that stay aloft and kill flying mosquitoes on contact.
- A. Golden Bear 1111
  - B. Oils
  - C. Ultra-low volume (ULV)
  - D. Chlordane
  - E. None of the Above
100. \_\_\_\_\_ applications involve small quantities of pesticide active ingredient in relation to the size of the area treated, typically less than 3 ounces per acre, which minimizes exposure and risks to people and the environment.
- A. Golden Bear 1111
  - B. ULV
  - C. Chlorinated hydrocarbons
  - D. Chlordane
  - E. None of the Above
101. Chemical Control of Adult Mosquitoes  
Because of environmental concerns and drift, \_\_\_\_\_ are not the most popular method.
- A. Adulticides
  - B. Oils
  - C. Chlorinated hydrocarbons
  - D. Chemical pesticides
  - E. None of the Above

102. Chemical pesticides, the technique used for adult mosquito control is known as \_\_\_\_\_ spray.

- A. Adulticides
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

103. A small quantity of the pesticide is \_\_\_\_\_ and broadcast in a fog that drifts into sites where the adult mosquitoes hide. At best, control is achieved up to 300 feet away, but it does help reduce the numbers of biting mosquitoes to tolerable levels.

- A. Aerosol bombs
- B. Hand-carried dispersal units
- C. ULV spraying
- D. Atomized into micron-size particles
- E. None of the Above

104. In recent years the use of vehicle-mounted units has decreased in favor of small, \_\_\_\_\_. This allows a more precise application of the pesticide.

- A. Aerosol bombs
- B. Hand-carried dispersal units
- C. ULV spraying
- D. Aerosol foggers
- E. None of the Above

105. The pesticide used for \_\_\_\_\_ is pyrethrum (sold as Pyrocide), a naturally occurring substance harvested from two species of Old World chrysanthemums, or pyrethrum flowers.

- A. Aerosol bombs
- B. Hand-carried dispersal units
- C. ULV spraying
- D. Aerosol foggers
- E. None of the Above

106. This material is the \_\_\_\_\_ for mosquito control, and it degrades into non-toxic by-products within 4 to 6 hours after spraying.

- A. Aerosol bombs
- B. Adulticides
- C. Least toxic available
- D. Aerosol foggers
- E. None of the Above

#### Indoor Control

107. Space sprays or aerosol "bombs," containing synergized pyrethrins 0.1%, are effective against adult mosquitoes. \_\_\_\_\_ may be needed during problem periods.

- A. Frequent treatments
- B. Temporary treatment
- C. One to two days of treatment
- D. Residual treatment
- E. None of the Above

Outdoor Control Adulticides

108. Space sprays or aerosol foggers containing pyrethrins result in rapid knockdown of adult mosquitoes. However, it is a \_\_\_\_\_ with little residual effect.

- A. Frequent treatments
- B. Temporary treatment
- C. One to two days of treatment
- D. Residual treatment
- E. None of the Above

109. \_\_\_\_\_ applied to tall grasses, weeds, trees, shrubs, and outbuildings, one to two days before use of the area, are effective.

- A. Frequent treatments
- B. Temporary treatment
- C. One to two days of treatment
- D. Residual sprays
- E. None of the Above

110. Some insecticides registered for residual mosquito control include: \_\_\_\_\_, chlorpyrifos (Dursban), and Malathion.

- A. Carbaryl (Sevin)
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

111. Malathion and \_\_\_\_\_ are extremely toxic to honey bees. Do not spray plants when in bloom. Mow weedy areas before treatment.

- A. Chlorinated hydrocarbons
- B. Adulticides
- C. Carbaryl (Sevin)
- D. Chlordane
- E. None of the Above

112. Bee losses are minimized by spraying late in the afternoon when bees are gone or when temperatures are below 45°F. \_\_\_\_\_ and methoxychlor are highly toxic to fish.

- A. Chlorinated hydrocarbons
- B. Adulticides
- C. Carbaryl (Sevin)
- D. Malathion
- E. None of the Above

Mosquito fish (*Gambusia affinis*)

113. Mosquito fish can eat \_\_\_\_\_ per day. They play an important role in mosquito control in ponds, canals, irrigated fields, and some other freshwater sources.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. 1-100 larvae
- D. 1,000-10,000 larvae
- E. None of the Above

114. The fish live two to three years; they are live-bearing and produce \_\_\_\_\_ each year.
- A. 100 to 500 larvae
  - B. 3 to 4 broods
  - C. 5 to 10 broods
  - D. 10 to 20 broods
  - E. None of the Above

#### Repellents

115. Repellents applied to the skin and clothing will prevent mosquito bites for \_\_\_\_\_ depending on the person, type, number of mosquitoes, and the type and percent of active ingredient in the repellent.

- A. One day
- B. Three to four hours
- C. One to five hours
- D. Two days
- E. None of the Above

116. N, N-Diethyl-m-toluamide (Deet) is very effective and widely used as a \_\_\_\_\_, but it should not be used indiscriminately, as severe allergies can develop.

- A. Frequent treatments
- B. Temporary treatment
- C. Laticide
- D. Residual treatment
- E. None of the Above

#### Prevention

117. Since most of the mosquitoes that transmit \_\_\_\_\_ will not travel very far, the risk of contracting Encephalitis can be minimized by controlling the mosquito breeding sites that are in close proximity to your home.

- A. Hepatitis
- B. Disease
- C. Encephalitis
- D. AIDS
- E. None of the Above

118. Water management, to prevent mosquito breeding, is essential for control. Eggs do not hatch unless they are \_\_\_\_\_.

- A. Have 100 to 500 larvae
- B. One week old
- C. In water
- D. Feed
- E. None of the Above

#### Pesticides and Mosquito Control Summary

119. Mosquito-borne diseases affect millions of people worldwide each year. In the United States, some species of mosquitoes can transmit diseases such as \_\_\_\_\_, dengue fever, and malaria to humans, and a variety of diseases to wildlife and domestic animals.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Encephalitis
- D. Human exposure
- E. None of the Above

120. To combat mosquitoes and the public health hazards they present, many states and localities have established \_\_\_\_\_.

- A. Pesticide applicators
- B. Infectious disease control programs
- C. Mosquito control programs
- D. Human exposure programs
- E. None of the Above

121. These programs, which are based on \_\_\_\_\_, can include non-chemical forms of prevention and control, as well as ground and aerial application of chemical and biological pesticides.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Encephalitis
- D. Human exposure
- E. None of the Above

122. The mission of the Environmental Protection Agency (EPA) is to protect \_\_\_\_\_ and the environment.

- A. Mosquito-borne diseases from happening
- B. Infectious diseases from spreading
- C. Human health
- D. Human exposure
- E. None of the Above

123. The EPA reviews and approves pesticides and their labeling to ensure that the pesticides used to protect \_\_\_\_\_ are applied by methods that minimize the risk of human exposure and adverse health and environmental effects.

- A. Public health
- B. Infectious diseases
- C. Encephalitis from occurring
- D. Human exposure from disease
- E. None of the Above

124. In relation to mosquito control, the Agency also serves as a source of information about pesticide and \_\_\_\_\_ to address the concerns of the general public, news media, and the state and local agencies dealing with outbreaks of infectious diseases or heavy infestations of mosquitoes.

- A. Non-pesticide controls
- B. Infectious diseases
- C. Encephalitis
- D. Human exposure
- E. None of the Above

#### Malathion for Mosquito Control

125. Officials responsible for mosquito control programs make decisions to use pesticides based on an evaluation of the \_\_\_\_\_ from diseases transmitted by mosquitoes or on an evaluation of the nuisance level that communities can tolerate from a mosquito infestation.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Risks to the general public
- D. Human exposure
- E. None of the Above

126. Based on \_\_\_\_\_, mosquito control officials select specific pesticides and other control measures that best suit local conditions in order to achieve effective control of mosquitoes with the least impact on human health and the environment.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Surveillance and monitoring
- D. Human exposure
- E. None of the Above

127. It is especially important to conduct effective \_\_\_\_\_ by eliminating breeding habitats or applying pesticides to control the early life stages of the mosquito.

- A. Mosquito-borne diseases programs
- B. Infectious diseases programs
- C. Mosquito prevention programs
- D. Human exposure programs
- E. None of the Above

128. \_\_\_\_\_, such as elimination of any standing water that could serve as a breeding site, help reduce the adult mosquito population and the need to apply other pesticides for adult mosquito control.

- A. Prevention programs
- B. Infectious diseases programs
- C. Encephalitis programs
- D. Human exposure programs
- E. None of the Above

129. Since no pesticide can be considered 100 percent safe, pesticide applicators and the general public should always exercise care and follow specified \_\_\_\_\_ during use to reduce risks.

- A. Mosquito-borne diseases programs
- B. Infectious diseases programs
- C. Safety precautions
- D. Human exposure
- E. None of the Above

What is Malathion?

130. Malathion is an organophosphate (OP) \_\_\_\_\_ that has been registered for use in the United States since 1956.

- A. Insecticide
- B. A product
- C. Kills adult mosquitoes and
- D. Larvicide
- E. None of the Above

131. When applied in accordance with the rate of application and safety precautions specified on the label, Malathion can be used \_\_\_\_\_ without posing unreasonable risks to human health or the environment.

- A. As an insecticide
- B. To kill mosquitoes
- C. To kill adults
- D. With other products
- E. None of the Above

How is Malathion Used in Mosquito Control?

132. The mosquito goes through four distinct stages during its life cycle: egg, larva, pupa, and adult. Malathion is an adulticide, used to \_\_\_\_\_.

- A. Support a pesticide system
- B. Avoid mosquitoes
- C. Kill adult mosquitoes
- D. Spread the herbicides
- E. None of the Above

133. In mosquito control programs conducted by state or local authorities, Malathion is applied by truck-mounted or \_\_\_\_\_.

- A. Insecticide systems
- B. Aircraft-mounted sprayers
- C. Kill adult mosquitoes
- D. Distribute ultra-low volume (ULV) spray
- E. None of the Above

134. Malathion is applied as a(n) \_\_\_\_\_. Ultra-low volume (ULV) spray sprayers dispense very fine aerosol droplets that stay aloft and kill mosquitoes on contact. Ultra-low volume (ULV) spray applications involve small quantities of pesticide active ingredient in relation to the size of the area treated.

- A. Insecticide Adjuvant
- B. Aircraft-mounted sprayers
- C. Oil
- D. Ultra-low volume (ULV) spray
- E. None of the Above

135. For mosquito control, Malathion is applied at a maximum rate of 0.23 pounds (or about 2.5 fluid ounces) of active ingredient per acre, which \_\_\_\_\_ exposure and risks to people and the environment.

- A. Minimizes
- B. Reduces some
- C. Maximizes
- D. Is produces a safe
- E. None of the Above

136. Malathion can be used for \_\_\_\_\_ programs without posing unreasonable risks to the general population when applied according to the label.

- A. Public health mosquito control
- B. Adults and children safety programs
- C. Health
- D. Safety
- E. None of the Above

137. The EPA has estimated the exposure and risks to both \_\_\_\_\_ posed by ULV aerial and ground applications of Malathion.

- A. Public health mosquito control and EPA
- B. Adults and children
- C. Workers and handlers
- D. Skin and inhalation exposure
- E. None of the Above

138. Because of the \_\_\_\_\_ released per acre of ground, the estimates found that for all scenarios considered, exposures were hundreds or even thousands of times below an amount that might pose a health concern.

- A. Public health mosquito control
- B. Laws mandating chemical
- C. Very Small amount of active ingredient
- D. Skin and inhalation exposure because of the chemical
- E. None of the Above

139. These estimates assumed several spraying events over a period of weeks, and also assumed that a toddler would ingest some soil and grass in addition to \_\_\_\_\_.

- A. High-dose poisoning
- B. Nausea, dizziness, or confusion
- C. Small amount of active ingredient
- D. Skin and inhalation exposure
- E. None of the Above

140. At high doses, Malathion, like other organophosphates, can over-stimulate the nervous system, causing \_\_\_\_\_.

- A. High-dose poisoning
- B. Nausea, dizziness, or confusion
- C. Small amount of active ingredient to sensitize
- D. Skin and inhalation exposure
- E. None of the Above

141. Severe \_\_\_\_\_ with any organophosphate can cause convulsions, respiratory paralysis, and death.

- A. Health concerns
- B. Death
- C. High-dose poisoning
- D. Skin and inhalation exposure
- E. None of the Above

142. Malathion used in mosquito control programs does not pose \_\_\_\_\_ or the environment.

- A. Unreasonable risks to wildlife
- B. Low toxicity damage
- C. Toxic to animals
- D. Threats
- E. None of the Above

143. Malathion degrades rapidly in the environment, especially in moist soil, and it displays \_\_\_\_\_ to birds and mammals.

- A. Risks to wildlife
- B. Low toxicity
- C. Toxic to insects
- D. To reduce risks
- E. None of the Above



144. Malathion is highly \_\_\_\_\_, including beneficial insects such as honeybees.

- A. Risks to wildlife
- B. Low toxicity
- C. *Toxic to insects*
- D. To reduce risks
- E. None of the Above

145. For that reason, the EPA has established specific precautions on the label to reduce such \_\_\_\_\_.

- A. *Risks*
- B. Low toxicity
- C. *Toxic to insects*
- D. To reduce risks
- E. None of the Above

#### Larvicides For Mosquito Control

146. Prevention programs, such as the elimination of any standing water that could serve as a breeding site, help reduce the \_\_\_\_\_ and the need to apply other pesticides for adult mosquito control.

- A. Risks to wildlife
- B. Adult mosquito population
- C. Toxicity
- D. Risks
- E. None of the Above

147. Since no pesticide can be considered 100 percent safe, pesticide applicators and the general public should always exercise care and follow specified safety precautions \_\_\_\_\_.

- A. Because of risks to wildlife
- B. Because of low toxicity
- C. Because of toxicity
- D. During use to reduce risks
- E. None of the Above

#### Larvicides

148. Larvicides kill mosquito larvae. Larvicides include \_\_\_\_\_, such as the microbial larvicides *Bacillus sphaericus* and *Bacillus thuringiensis israelensis*.

- A. Biological insecticides
- B. Adult mosquito population systems
- C. Integrated Pest Management (IPM)
- D. Pesticide usage
- E. None of the Above

149. Larvicides include other pesticides, such as temephos, methoprene, oils, and monomolecular films. Larvicide treatment of breeding habitats \_\_\_\_\_ in nearby areas.

- A. Control biological insecticides
- B. Help reduce the Adult mosquito population
- C. Help control fish
- D. Limit pesticide usage
- E. None of the Above

How are Larvicides Used in Mosquito Control?

150. State and local agencies in charge of mosquito control typically employ a variety of techniques in a(n) \_\_\_\_\_ program.

- A. Biological insecticide
- B. Adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Pesticide usage
- E. None of the Above

151. An IPM approach includes surveillance, \_\_\_\_\_, larviciding, and adulticiding to control mosquito populations.

- A. Biological insecticide control
- B. Adult mosquito population control
- C. Surveillance
- D. Source reduction
- E. None of the Above

152. Since mosquitoes must have water to breed, source reduction can be as simple as turning over trapped water in a container to undertaking \_\_\_\_\_ of marsh water levels.

- A. Large-scale engineering and management
- B. Large-scale adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Large-scale pesticide usage
- E. None of the Above

153. Larviciding involves applying pesticides to breeding habitats to kill mosquito larvae.

Larviciding can \_\_\_\_\_ in a control program.

- A. Reduce overall biological insecticides
- B. Reduce overall adult mosquito population
- C. Assist
- D. Reduce overall Pesticide usage
- E. None of the Above

154. Killing mosquito larvae before they emerge as adults can reduce or \_\_\_\_\_ the need for ground or aerial application of pesticides to kill adult mosquitoes.

- A. Reduce overall biological insecticides
- B. Reduce overall adult mosquito population
- C. Assist
- D. Eliminate
- E. None of the Above

What are Microbial Larvicides?

155. Microbial larvicides are bacteria that \_\_\_\_\_ as pesticides for control of mosquito larvae in outdoor areas such as irrigation ditches, flood water, standing ponds, woodland pools, pastures, tidal water, fresh or saltwater marshes, and storm water retention areas.

- A. Reduce overall adult mosquito population
- B. Mosquito species
- C. *Bacillus thuringiensis israelensis* (Bti)
- D. Naturally occurring soil bacterium
- E. None of the Above

156. Duration of effectiveness depends primarily on the \_\_\_\_\_, the environmental conditions, the formulation of the product, and water quality.

- A. Microbial larvicides
- B. Mosquito species
- C. Weather
- D. Naturally occurring soil bacterium
- E. None of the Above

157. \_\_\_\_\_ may be used along with other mosquito control measures in an IPM program.

- A. Microbial larvicides
- B. Mosquito species
- C. *Bacillus thuringiensis israelensis* (Bti)
- D. Naturally occurring soil bacterium
- E. None of the Above

158. The microbial larvicides used for mosquito control are \_\_\_\_\_ and *Bacillus sphaericus* (*B. sphaericus*).

- A. Microbial larvicides
- B. Mosquito species
- C. *Bacillus thuringiensis israelensis* (Bti)
- D. Naturally occurring soil bacterium
- E. None of the Above

159. *Bacillus thuringiensis israelensis* is a \_\_\_\_\_ registered for control of mosquito larvae. Bti was first registered by the EPA as an insecticide in 1983.

- A. Microbial larvicides
- B. Mosquito species
- C. *Bacillus thuringiensis israelensis* (Bti)
- D. Naturally occurring soil bacterium
- E. None of the Above

160. Mosquito larvae eat the \_\_\_\_\_ product that is made up of the dormant spore form of the bacterium and an associated pure toxin.

- A. Microbial larvicides
- B. Mosquito species
- C. *Bacillus thuringiensis israelensis* (Bti)
- D. Naturally occurring soil bacterium
- E. None of the Above

161. The toxin disrupts the gut in the mosquito by binding to receptor cells present in insects, but not in \_\_\_\_\_.

- A. Mammals
- B. Mosquito species
- C. Insects
- D. Humans
- E. None of the Above

162. There are \_\_\_\_\_ for use in the United States. Aquabac, Teknar, Vectobac, and LarvX are examples of common trade names for the mosquito control products.

- A. Many insecticides
- B. 26 Bti products registered
- C. Many Bti products
- D. One to four products
- E. None of the Above

163. Bacillus sphaericus is a naturally occurring bacterium that is found throughout the world. B. sphaericus was initially \_\_\_\_\_ for use against various kinds of mosquito larvae.

- A. EPA as an insecticide in 1983
- B. Registered by the EPA in 1999
- C. Registered by the EPA in 1991
- D. One to four week systematic
- E. None of the Above

164. VectoLex CG and WDG are registered B. sphaericus products and are effective for approximately \_\_\_\_\_ after application.

- A. One hour, depending on the weather
- B. One year
- C. Three to six weeks
- D. One to four weeks
- E. None of the Above

165. The microbial pesticides have undergone extensive testing prior to registration. They are \_\_\_\_\_, so there are no concerns for human health effects with Bti or B. sphaericus when they are used according to label directions.

- A. Essentially Nontoxic to humans
- B. Risks to wildlife
- C. Essentially do not pose risks
- D. Essentially risks to human health
- E. None of the Above

Do Microbial Larvicides Pose Risks to Wildlife or the Environment?

166. Extensive testing shows that microbial larvicides \_\_\_\_\_, nontarget species, or the environment, when used according to label directions.

- A. Nontoxic to humans
- B. Pose risks to wildlife
- C. Do not pose risks to wildlife
- D. Risks to human health
- E. None of the Above

What is Methoprene?

167. Methoprene is a compound first \_\_\_\_\_ that mimics the action of an insect growth-regulating hormone and prevents the normal maturation of insect larvae.

- A. EPA as an insecticide in 1983
- B. Registered by the EPA in 1982
- C. Registered by the EPA in 1975
- D. Registered by the EPA in 1981
- E. None of the Above

168. It is \_\_\_\_\_ to kill mosquito larvae, and it may be used along with other mosquito control measures in an IPM program.

- A. A solid
- B. Granules
- C. Applied to water
- D. A liquid and pelletized formulations
- E. None of the Above

169. Altosid is the name of the methoprene product used in mosquito control and is applied as briquettes (similar in form to charcoal briquettes), pellets, \_\_\_\_\_, and liquids.

- A. Solids
- B. Sand granules
- C. Liquid
- D. Crystals
- E. None of the Above

170. The \_\_\_\_\_ can be applied by helicopter and fixed-wing aircraft.

- A. Solids
- B. Sand granules
- C. Applied to water
- D. Liquid and pelletized formulations
- E. None of the Above

Does Methoprene Pose Risks to Human Health?

171. Methoprene, used for mosquito control according to its label directions, \_\_\_\_\_ to human health. In addition to posing low toxicity to mammals, there is little opportunity for human exposure, since the material is applied directly to ditches, ponds, marshes, or flooded areas that are not drinking water sources.

- A. Nontoxic to humans
- B. Pose risks to wildlife
- C. Do not pose unreasonable risks
- D. Risks to human health
- E. None of the Above

172. Does Methoprene Pose Risks to Wildlife or the Environment?

Methoprene used in mosquito control programs does \_\_\_\_\_ or the environment.

- A. Nontoxic to humans
- B. Pose risks to wildlife
- C. Not pose unreasonable risks to wildlife
- D. Risks to human health
- E. None of the Above

173. Toxicity of methoprene to birds and fish is low, and it is \_\_\_\_\_.

- A. Nontoxic to humans
- B. Pose risks to wildlife
- C. Do not pose risks
- D. Nontoxic to bees
- E. None of the Above

174. Methoprene breaks down quickly in water and soil and \_\_\_\_\_ into ground water.

- A. Will not leach
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to human health
- E. None of the Above

175. Methoprene mosquito control products present \_\_\_\_\_ risk to freshwater fish, freshwater invertebrates, and estuarine species.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to human health
- E. None of the Above

176. Temephos is an organophosphate (OP) pesticide \_\_\_\_\_ to control mosquito larvae, and it is the only organophosphate with larvicidal use.

- A. EPA as an insecticide in 1983
- B. Adductive
- C. Registered by the EPA in 1991
- D. Registered by the EPA in 1965
- E. None of the Above

177. It is an important \_\_\_\_\_ for mosquito control programs; its use helps prevent mosquitoes from developing resistance to the bacterial larvicides.

- A. Insecticide
- B. Tool
- C. Adjuvant
- D. Resistance management tool
- E. None of the Above

178. Temephos is used in areas of \_\_\_\_\_, shallow ponds, swamps, marshes, and intertidal zones. It may be used along with other mosquito control measures in an IPM program.

- A. Running waters
- B. Standing water
- C. Grass
- D. Along banks
- E. None of the Above

179. Abate is the trade name of the \_\_\_\_\_ used for mosquito control.

- A. Golden Bear 1111
- B. Oils
- C. Temephos product
- D. Chlordane
- E. None of the Above

180. Temephos is applied most commonly by \_\_\_\_\_, but can be applied by backpack sprayers, fixed-wing aircraft, and right-of-way sprayers in either liquid or granular form.

- A. Aerosol bombs
- B. Hand-carried dispersal units
- C. Helicopter
- D. Aerosol foggers
- E. None of the Above

181. It is applied to water, and the \_\_\_\_\_ is very small in relation to the area covered, less than 1 ounce of active ingredient per acre for the liquid and 8 ounces per acre for the granular formulations.

- A. Aerosol mist
- B. Potentially dangerous product
- C. Product
- D. Amount of temephos
- E. None of the Above

Does Temephos Pose Risks to Human Health?

182. Temephos, applied according to the label for mosquito control, \_\_\_\_\_ to human health.

- A. Nontoxic
- B. Minimal acute and chronic health risks
- C. Do not unreasonable pose risks
- D. None of the Above

183. Current mosquito larviciding techniques pose \_\_\_\_\_ aquatic species and the aquatic ecosystem.

- A. No risk
- B. Minimal acute and chronic risks
- C. Any major risks
- D. Some risk to nontarget
- E. None of the Above

184. Although temephos presents \_\_\_\_\_ to birds and terrestrial species, available information suggests that it is more toxic to aquatic invertebrates than alternative larvicides.

- A. It is nontoxic to humans
- B. Minimal acute and chronic risk
- C. No risks
- D. Relatively low risk
- E. None of the Above

185. For this reason, the EPA is limiting temephos use to areas where less-hazardous alternatives would not be effective, specifying intervals between applications, and limiting the use of \_\_\_\_\_.

- A. Product application
- B. Minimal acute and chronic risks
- C. Posing risks
- D. High application rates
- E. None of the Above

186. Temephos \_\_\_\_\_, and post-application exposure is minimal.

- A. Breaks down within a few days in water
- B. Can be placed even on ice for season-long control
- C. Will provide 150 days of uninterrupted mosquito control
- D. Toxin disrupts the lining of the larvae's intestine
- E. None of the Above

187. Does Temephos Pose Risks to Wildlife or the Environment?

Because temephos is applied directly to water, \_\_\_\_\_ on terrestrial animals or birds.

- A. Breaks down within a few days in water
- B. It is not expected to have a direct impact
- C. Lasts 150 days of uninterrupted mosquito control
- D. Toxin will not disrupt
- E. None of the Above

Monomolecular Films?

188. Monomolecular films are \_\_\_\_\_ that spread a thin film on the surface of the water that makes it difficult for mosquito larvae, pupae, and emerging adults to attach to the water's surface, causing them to drown.

- A. An insecticide
- B. Deet Related
- C. Adulicides
- D. Low-toxicity pesticides
- E. None of the Above

189. Films may remain active typically for \_\_\_\_\_ on standing water, and have been used in the United States in floodwaters, brackish waters, and ponds.

- A. One day
- B. 10-14 days
- C. One year
- D. One to four weeks
- E. None of the Above

190. They may be used along with other mosquito control measures in an IPM program. They are also known under the trade names \_\_\_\_\_ and Agnique MMF.

- A. Golden Bear 1111
- B. Arosurf MSF
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

Do Monomolecular Films Pose Risks to Human Health?

191. Monomolecular films, used according to label directions for larva and pupa control, \_\_\_\_\_.

- A. Are toxic to humans
- B. Do have minimal acute and chronic risks
- C. Do not pose risks to human health
- D. Pose great risks to human health
- E. None of the Above



192. In addition to low toxicity, there is \_\_\_\_\_, since the material is applied directly to ditches, ponds, marshes, or flooded areas that are not drinking water sources.

- A. Little opportunity for human exposure
- B. Minimal acute and chronic health problems
- C. No chance of problems
- D. No risks to human health
- E. None of the Above

Do Films Pose Risks to Wildlife or the Environment?

193. Monomolecular films, used according to label directions for larva and pupa control, \_\_\_\_\_ to the environment.

- A. Nontoxic
- B. Minimal acute and chronic risks
- C. Safe
- D. Pose minimal risks
- E. None of the Above

194. They do not last very long in the environment, and are usually applied only to standing water, such as \_\_\_\_\_, woodland pools, or containers that contain few non-target organisms.

- A. Running waters
- B. On ponds
- C. Streams
- D. Roadside ditches
- E. None of the Above

What are Oils?

195. \_\_\_\_\_, like films, are pesticides used to form a coating on top of water to drown larvae, pupae, and emerging adult mosquitoes.

- A. Golden Bear 1111
- B. Adulticides
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

196. They are specially derived from petroleum distillates and have been used for many years in the United States to \_\_\_\_\_ on crops and orchard trees, and to control mosquitoes. They may be used along with other mosquito control measures in an IPM program.

- A. Spray
- B. Kill mosquitoes
- C. Kill aphids
- D. Apply
- E. None of the Above

197. Trade names for oils used in mosquito control are Bonide, BVA2, and \_\_\_\_\_.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

Do Oils Pose Risks to Human Health?

198. Oils, used according to label directions for larva and pupa control, \_\_\_\_\_ to human health.

- A. Nontoxic
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks
- E. None of the Above

199. In addition to \_\_\_\_\_, there is little opportunity for human exposure, since the material is applied directly to ditches, ponds, marshes, or flooded areas that are not drinking water sources.

- A. Low toxicity
- B. Minimal acute and chronic risks
- C. Proper safety
- D. Risks to human health
- E. None of the Above

Do Oils Pose Risks to Wildlife or the Environment?

200. Oils, if misapplied, \_\_\_\_\_ and other aquatic organisms. For that reason, the EPA has established specific precautions on the label to reduce such risks.

- A. It is nontoxic to humans
- B. Minimal acute and chronic risks
- C. May be toxic to fish
- D. Little risks to human health
- E. None of the Above

Naled For Mosquito Control

201. Officials responsible for mosquito control programs make decisions to use pesticides based on an evaluation of the \_\_\_\_\_ from diseases transmitted by mosquitoes or on an evaluation of the nuisance level that communities can tolerate from a mosquito infestation.

- A. Risk of low toxicity
- B. Risk of acute and chronic
- C. Risks to the general public
- D. Risks to animals
- E. None of the Above

202. Based on surveillance and monitoring, mosquito control officials select specific pesticides and other control measures that best suit local conditions in order to achieve effective control of mosquitoes with the \_\_\_\_\_ and the environment.

- A. Some impact on human health
- B. Least impact on human health
- C. Greatest impact on human health
- D. Risks to human health
- E. None of the Above

203. It is especially important to conduct effective mosquito prevention programs by eliminating \_\_\_\_\_ or applying pesticides to control the early life stages of the mosquito.

- A. Insecticide usage
- B. Over-spraying
- C. Breeding habitats
- D. Larvae
- E. None of the Above

204. Prevention programs, such as elimination of any standing water that could serve as a breeding site, help \_\_\_\_\_ mosquito population and the need to apply other pesticides for adult mosquito control.

- A. Minimize
- B. Control
- C. Reduce adult mosquito
- D. Reduce Larvae
- E. None of the Above

What is Naled?

205. Naled is an organophosphate (OP) insecticide that has been \_\_\_\_\_ for use in the United States.

- A. Registered by the EPA in 1958
- B. Registered by the EPA in 1960
- C. Registered by the EPA in 1975
- D. Registered since 1959
- E. None of the Above

206. It is used primarily for controlling adult mosquitoes, but Naled is also used on food and feed crops, and in greenhouses. When applied in accordance with the rate of application and the safety precautions specified on the label, Naled can be used to kill mosquitoes without posing \_\_\_\_\_ or the environment.

- A. Any health risks
- B. Minimal acute and chronic risks
- C. Any problems
- D. Unreasonable risks to human health
- E. None of the Above

How is Naled Used in Mosquito Control?

207. Naled is an adulticide used to \_\_\_\_\_. In mosquito control programs conducted by state or local authorities, Naled is applied by truck-mounted or aircraft-mounted sprayers.

- A. Insecticide
- B. Control pupals
- C. Kill adult mosquitoes
- D. Larva
- E. None of the Above

208. Naled is applied as an Ultra-low volume (ULV) spray. \_\_\_\_\_ sprayers dispense very fine aerosol droplets that stay aloft and kill mosquitoes on contact.

- A. Backpack
- B. Aerial
- C. Ultra-low volume (ULV)
- D. Aerosol
- E. None of the Above

209. For mosquito control, Naled is applied at a maximum rate of \_\_\_\_\_ of active ingredient per acre for aerial application and 0.1 pounds (0.33 ounce) per acre.

- A. 1 gram to the ounce
- B. 20 ounces to the pound
- C. 1 pound per gallon
- D. 0.05 pounds (0.8 ounce)
- E. None of the Above

Does Naled Pose Risks to Human Health?

210. Naled can be used for public health mosquito control programs without posing unreasonable \_\_\_\_\_ when applied according to the label.

- A. Health risks to humans
- B. Problems
- C. Risks
- D. Risks to the general population
- E. None of the Above

211. The EPA has estimated the exposure and \_\_\_\_\_ posed by ULV aerial and ground applications of Naled.

- A. Problems
- B. Risks to both adults and children
- C. Health risks
- D. Minimal acute and chronic risks
- E. None of the Above

212. Because of the very small amount of active ingredient released per acre of ground, the estimates found that for all scenarios considered, exposures were hundreds or even thousands of times below an amount that \_\_\_\_\_.

- A. Are nontoxic to humans
- B. Might be risks to both adults and children
- C. Might pose a health concern
- D. Are minimal
- E. None of the Above

213. These estimates assumed several spraying events over a period of weeks, and also assumed that a toddler would ingest some soil and grass in addition to skin and \_\_\_\_\_.

- A. Nausea
- B. Dizziness
- C. Eyes
- D. Inhalation exposure
- E. None of the Above

214. Naled like other organophosphates can over stimulate the nervous system causing \_\_\_\_\_, dizziness, or confusion.

- A. Nausea
- B. Convulsions
- C. Fever
- D. Acute and chronic
- E. None of the Above

215. Severe high-dose poisoning with any organophosphate can cause convulsions, respiratory paralysis, and \_\_\_\_\_.

- A. Nausea
- B. Dizziness
- C. Convulsions
- D. Death
- E. None of the Above

216. Does Naled Pose Risks to Wildlife or the Environment?

Naled used in mosquito control programs does not pose unreasonable \_\_\_\_\_ or the environment.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Risks to wildlife
- D. Risks to human health
- E. None of the Above

217. Naled degrades rapidly in the environment, and it displays \_\_\_\_\_ to birds and mammals.

- A. Non toxicity
- B. Low toxicity
- C. High toxicity
- D. Extreme risks
- E. None of the Above

218. \_\_\_\_\_ risk to fish is not expected, but there is potential for risks to invertebrates from the repeated use of Naled.

- A. Toxic
- B. Acute and chronic
- C. Extreme
- D. High
- E. None of the Above

219. Naled is \_\_\_\_\_ to insects, including beneficial insects such as honeybees. For that reason, the EPA has established specific precautions on the label to reduce such risk.

- A. Non-toxic
- B. Acute and chronic
- C. Applied
- D. Highly toxic
- E. None of the Above

What are Synthetic Pyrethroids?

220. Pyrethroids are synthetic chemical insecticides that act in a similar manner to \_\_\_\_\_, which are derived from chrysanthemum flowers.

- A. Golden Bear 1111
- B. Pyrethrins
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

221. Pyrethroids are widely used for controlling various insects. Permethrin, \_\_\_\_\_, and sumithrin are synthetic pyrethroids commonly used in mosquito control programs to kill adult mosquitoes.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Resmethrin
- E. None of the Above

222. Permethrin has been \_\_\_\_\_. It is currently registered and sold in a number of products such as household insect foggers and sprays, tick and flea sprays for yards, flea dips and sprays for cats and dogs, termite treatments, agricultural and livestock products, and mosquito abatement products.

- A. EPA as an insecticide in 1983
- B. Registered by the EPA since 1977
- C. Registered by the EPA in 1975
- D. Registered by the EPA since 1998
- E. None of the Above

223. Resmethrin has been \_\_\_\_\_ and is used to control flying and crawling insects in the home, lawn, garden, and industrial sites. It can also be used to control insects on ornamental plants (outdoor and greenhouse use), on pets and horses, and as a mosquitoicide..

- A. EPA as an insecticide in 1983
- B. Registered by the EPA since 1977
- C. Registered by the EPA in 1975
- D. Registered by the EPA since 1971
- E. None of the Above

224. Sumithrin has been \_\_\_\_\_ and is used to control adult mosquitoes and as an insecticide in transport vehicles such as aircraft, ships, railroad cars, and truck trailers.

- A. EPA as an insecticide in 1983
- B. Registered by the EPA since 1977
- C. Registered by the EPA in 1975
- D. Registered by the EPA since 1971
- E. None of the Above

#### Synthetic Pyrethroids Used in Adult Mosquito Control

225. Most \_\_\_\_\_ control products can be applied only by public health officials and trained personnel of mosquito control districts.

- A. Aerosol bombs
- B. Hand-carried dispersal units
- C. ULV spraying
- D. Aerosol foggers
- E. None of the Above

226. Mosquito control professionals apply pyrethroids as an \_\_\_\_\_ spray. Ultra-low volume (ULV) sprayers dispense very fine aerosol droplets that stay aloft and kill adult mosquitoes on contact.

- A. Golden Bear 1111
- B. Oils
- C. Ultra-low volume (ULV)
- D. Chlordane
- E. None of the Above

227. Pyrethroids used in mosquito control are typically mixed with a synergist compound, such as \_\_\_\_\_, which enhances the effectiveness of the active ingredient.

- A. Golden Bear 1111
- B. Piperonyl butoxide
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

228. The product is often diluted in water or oil and applied at rates \_\_\_\_\_ of a pound of active ingredient or less than 4 fluid ounces of mixed formulation per acre.

- A. Less than 1/10th
- B. More than 1/10th
- C. In water
- D. Less than 1/100th
- E. None of the Above

Do Pyrethroids Pose Risks to Human Health?

229. Pyrethroids can be used for public health mosquito control programs without posing \_\_\_\_\_ when applied according to the label.

- A. Danger
- B. Problems
- C. Health risks
- D. Unreasonable Risks to human health
- E. None of the Above

230. Pyrethroids are considered to pose \_\_\_\_\_ to humans, but at high doses, pyrethroids can affect the nervous system.

- A. No risk
- B. Minimal risks
- C. Slight risks of acute toxicity
- D. Major risks
- E. None of the Above

Do Pyrethroids Pose Risks to Wildlife or the Environment?

231. Pyrethroids used in mosquito control programs \_\_\_\_\_ risks to wildlife or the environment.

- A. Are no
- B. Minimal
- C. Do not pose unreasonable
- D. Human health
- E. None of the Above

232. Pyrethroids, when applied at mosquito control rates, are low in toxicity to mammals, and \_\_\_\_\_ to birds.

- A. Are practically nontoxic
- B. Minimal dangerous
- C. Do not pose risks
- D. Are very dangerous
- E. None of the Above

233. Mosquito control formulations of permethrin break down in the environment and \_\_\_\_\_ and sunlight accelerate this process.

- A. Running waters
- B. High temperatures
- C. Environmental issues
- D. Cold weather
- E. None of the Above

234. Pyrethroids are \_\_\_\_\_ to fish and to bees. For this reason, the EPA has established specific precautions on the label to reduce such risks, including restrictions that prohibit the direct application of products to open water or within 100 feet of lakes, streams, rivers, or bays.
- A. Nontoxic
  - B. Minimally acute and chronic health related
  - C. Do not pose risks
  - D. Toxic
  - E. None of the Above

Anopheles spp.

Of the insects that serve as vectors for parasitic diseases, this genus is arguably the most important.

235. Of the approximately \_\_\_\_\_ of Anopheles, about two dozen serve as vectors for malaria (Plasmodium spp.) in humans.
- A. 100 to 500 species
  - B. 3 to 4 species
  - C. 422 species
  - D. 300 species
  - E. None of the Above

236. There are about 422 species of Anopheles worldwide, many of them sibling species that can only be identified using genetic techniques. Of these, about \_\_\_\_\_ are vectors of the protozoan Plasmodium that causes malaria, but only about 40 are important.

- A. 100
- B. 70
- C. All
- D. 1 of 2
- E. None of the Above

237. Malaria infects \_\_\_\_\_ people and kills 1.5-2.7 million people each year, making it by far the most serious of the diseases spread by insects.

- A. 100 to 500 million
- B. 300-500 million
- C. 1-10 million
- D. 5 billion million
- E. None of the Above

238. Culex pipiens, the \_\_\_\_\_ has a distribution that roughly includes the northern half of the United States.

- A. Culex quinquefasciatus
- B. Culex pipiens
- C. Culex restuans
- D. Hibernating female
- E. None of the Above

239. The species is replaced by \_\_\_\_\_, the Southern House Mosquito, in the southern United States with limited overlap in portions of the Midwest.

- A. Culex quinquefasciatus
- B. Culex pipiens
- C. Culex restuans
- D. Anopheles farauti
- E. None of the Above



240. \_\_\_\_\_ provides the life cycle model for most of the domestic Culex in temperate areas.
- A. Culex quinquefasciatus
  - B. Culex pipiens
  - C. Culex restuans
  - D. Anopheles farauti
  - E. None of the Above
241. The \_\_\_\_\_ pass the winter in diapause and do not become active during periods of warm winter weather.
- A. Culex quinquefasciatus
  - B. Culex pipiens
  - C. Culex restuans
  - D. Females
  - E. None of the Above
242. \_\_\_\_\_ are common in basements, outbuildings, and subterranean enclosures.
- A. Culex quinquefasciatus
  - B. Culex pipiens
  - C. Culex restuans
  - D. Hibernating females
  - E. None of the Above
243. Like \_\_\_\_\_, the females congregate near moisture and move their resting location during the winter to remain in a humid atmosphere.
- A. Culex quinquefasciatus
  - B. Culex pipiens
  - C. Culex restuans
  - D. Anopheles farauti
  - E. None of the Above
244. Mortality can be extensive during periods of \_\_\_\_\_.
- A. Rain
  - B. Summer
  - C. Birds and Bats
  - D. Winter drought
  - E. None of the Above
245. \_\_\_\_\_ emerge from hibernation during May and begin depositing egg rafts in suitable habitat.
- A. Culex quinquefasciatus
  - B. Culex pipiens
  - C. Males
  - D. Females
  - E. None of the Above
246. Populations of this mosquito usually peak during August, but \_\_\_\_\_ well into September.
- A. Average out
  - B. Bottom out
  - C. Increase
  - D. Drop
  - E. None of the Above

247. The adults from the \_\_\_\_\_ of the season lose all interest in blood meal hosts but will move in and out of overwintering sites during periods of mild fall weather.

- A. Last generation
- B. Breeding habitats
- C. Temporary ground water
- D. Eggs
- E. None of the Above

248. Larvae rarely persist in \_\_\_\_\_ after females have entered hibernation.

- A. Rain
- B. Breeding habitats
- C. Temporary ground water
- D. Summer
- E. None of the Above

249. \_\_\_\_\_ can be found in a fairly wide range of larval habitats, but are generally associated with water that has a high organic content.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. *Anopheles farauti*
- E. None of the Above

WPS Requires Notification of Applications

250. Employers must notify workers about pesticide applications on the \_\_\_\_\_ if they will be on or within a quarter (1/4) mile of the treated area.

- A. Agricultural Use Requirements
- B. Pesticide applications
- C. Restricted-entry interval (REI)
- D. Agricultural establishment
- E. None of the Above

251. In most cases, employers may choose between oral warnings or \_\_\_\_\_, but they must tell workers which warning method is in effect. All applications must be additionally recorded and displayed at the central location.

- A. Agricultural Use Requirements
- B. Posted warning signs
- C. Restricted-entry interval (REI)
- D. Agricultural establishment
- E. None of the Above

252. Most products allow \_\_\_\_\_ either orally or by posting a field warning sign, one or the other is acceptable as long as workers are informed of which method is being used.

- A. Agricultural Use Requirements
- B. Worker notification
- C. Restricted-entry interval (REI)
- D. Agricultural establishment
- E. None of the Above

253. You must provide double notification if the pesticide label has this statement in the "Directions for Use" section under the heading "\_\_\_\_\_":

- A. Agricultural Use Requirements
- B. Pesticide applications
- C. Restricted-entry interval (REI)
- D. Agricultural establishment
- E. None of the Above

254. "Notify workers of the \_\_\_\_\_ by warning them orally AND by posting warning signs at entrances to treated areas."

- A. Agricultural Use Requirements
- B. Application
- C. Restricted-entry interval (REI)
- D. Agricultural establishment
- E. None of the Above

255. If double notification is specified on the pesticide label workers must be orally notified about REIs and treated fields must be physically posted with warning signs during the \_\_\_\_\_.

- A. Agricultural Use Requirements
- B. Pesticide applications
- C. Restricted-entry interval (REI)
- D. None of the Above

256. It is the \_\_\_\_\_ responsibility to post warning signs in the field if it is required. Farms employing ONLY immediate family members are not required to post the field.

- A. Agricultural Use Requirements
- B. Pesticide applications
- C. Restricted-entry interval (REI)
- D. Agricultural establishment's
- E. None of the Above

257. Signs must have the words "\_\_\_\_\_" and "Pesticides-Pesticidas" at the top and "Keep Out-No Entre" at the bottom. Signs must be at least 14" x 16", with a minimum letter height of one inch.

- A. Agricultural Use Requirements
- B. Pesticide applications
- C. Restricted-entry interval (REI)
- D. Agricultural establishment
- E. None of the Above

258. The Spanish portion of the sign may be replaced with a (n) \_\_\_\_\_ read by the majority of non-English speaking workers. In greenhouses and nurseries, smaller signs (4.5" x 5") are acceptable.

- A. Agricultural Use Requirements
- B. Substitute language
- C. Restricted-entry interval (REI)
- D. Agricultural establishment
- E. None of the Above

259. Warning signs must be: Posted 24 hours or less \_\_\_\_\_.
- A. With specific directions not to enter during the REI
  - B. Explaining exposure to pesticides
  - C. Before application
  - D. For all workers and handlers
  - E. None of the Above
260. Removed within three (3) days after the end of the \_\_\_\_\_.
- A. Specific directions not to enter during the REI
  - B. Exposure to pesticides
  - C. REI
  - D. Word schedule for workers and handlers
  - E. None of the Above
261. Posted so they can be seen at all \_\_\_\_\_, including borders adjacent to labor camps.
- A. Specific directions not to enter during the REI
  - B. Exposure areas to pesticides
  - C. Normal entrances to treated areas
  - D. Workers and handlers meetings
  - E. None of the Above
262. If no employees were involved with treatment, or the employees do not come within a quarter (1/4) mile, \_\_\_\_\_.
- A. Will receive specific directions not to enter during the REI
  - B. Or will receive exposure to pesticides
  - C. No posting is required
  - D. Workers and handlers are to inform all others
  - E. None of the Above
263. \_\_\_\_\_ must be delivered in a manner understood by workers, using an interpreter if necessary.
- A. Specific directions not to enter during the REI
  - B. Exposure to pesticides information
  - C. Oral warnings
  - D. MSDS and label information
  - E. None of the Above
264. \_\_\_\_\_ Requires That Specific Information Regarding Applications and Safety Be Posted at a Central Location
- A. Specific directions not to enter during the REI
  - B. Exposure to pesticides Law
  - C. WPS
  - D. REI
  - E. None of the Above
265. The \_\_\_\_\_ requirement that information be posted (displayed) at a central location is cited by the EPA as one of the most commonly violated provisions.
- A. Specific REI
  - B. Exposure to pesticides
  - C. WPS
  - D. Primary workers and handlers'
  - E. None of the Above

WHAT IS THE WORKER PROTECTION STANDARD?

266. \_\_\_\_\_ is a regulation issued by the U.S. Environmental Protection Agency. It covers pesticides that are used in the production of agricultural plants on farms, forests, nurseries, and greenhouses.

- A. REI
- B. Exposure to pesticides
- C. WPS
- D. Early Entry
- E. None of the Above

267. The \_\_\_\_\_ requires you to take steps to reduce the risk of pesticide-related illness and injury if you use such pesticides.

- A. REI
- B. Exposure to pesticides
- C. WPS
- D. Early Entry
- E. None of the Above

268. Employ \_\_\_\_\_ or pesticide handlers who are exposed to such pesticides.

- A. Specific directions not to enter during the REI
- B. Exposure to pesticides
- C. REI or WPS
- D. Workers
- E. None of the Above

269. If you are an agricultural pesticide user and/or an employer of agricultural workers or pesticide handlers, the \_\_\_\_\_ requires you to provide to your employees and, in some cases, to yourself and to others information about exposure to pesticides, protections against exposures to pesticides, and ways to mitigate exposures to pesticides.

- A. REI
- B. Exposure to pesticides
- C. WPS
- D. Early Entry
- E. None of the Above

270. \_\_\_\_\_ will be accomplished by requiring decontamination supplies and emergency assistance.

- A. Notifying workers
- B. Mitigate exposures
- C. Requiring safety training
- D. None of the Above

INFORMATION

271. Pesticide safety training — for \_\_\_\_\_.

- A. Specific directions not to enter during the REI.
- B. Exposure to pesticides
- C. REI or WPS
- D. Workers and handlers
- E. None of the Above

272. Pesticide safety poster — to be displayed for \_\_\_\_\_.

- A. Specific directions not to enter during the REI.
- B. Exposure to pesticides
- C. REI or WPS
- D. Workers and handlers
- E. None of the Above

273. Access to labeling information — for pesticide handlers and early-entry \_\_\_\_\_.

- A. Specific directions not to enter during the REI.
- B. Exposure to pesticides
- C. REI or WPS
- D. Workers
- E. None of the Above

274. \_\_\_\_\_— centrally located application information of pesticide treatments on the establishment.

- A. Access to specific information
- B. Exposures to pesticides
- C. Avoid inadvertent exposures
- D. Mitigate pesticide exposures
- E. None of the Above

#### PROTECTION

275. To ensure that employees will be \_\_\_\_\_, the WPS requires employers to: Prohibit handlers from applying a pesticide in a way that will expose workers or other persons.

- A. Protected from exposures to pesticides
- B. Exposures to pesticides
- C. Avoiding inadvertent exposures
- D. Mitigating pesticide exposures
- E. None of the Above

276. \_\_\_\_\_ from areas being treated with pesticides.

- A. Access to specific information to Workers
- B. Exposures to pesticides
- C. Avoid inadvertent Worker exposures
- D. Exclude workers
- E. None of the Above

277. \_\_\_\_\_ from areas that remain under a restricted-entry interval (REI), with narrow exceptions.

- A. Access
- B. Exclude workers
- C. Avoid inadvertent exposures
- D. Mitigate pesticide exposures
- E. None of the Above

278. \_\_\_\_\_ who are doing permitted tasks in treated areas during an REI, including special instructions and duties related to correct use of PPE.

- A. Workers
- B. Handlers
- C. Avoid inadvertent exposures to employees
- D. Protect early-entry workers
- E. None of the Above

279. Notify workers about treated areas so they can \_\_\_\_\_.

- A. Have access to specific information
- B. Avoid all exposures to pesticides
- C. Avoid all exposures
- D. Avoid inadvertent exposures
- E. None of the Above

280. Protect handlers during handling tasks, including \_\_\_\_\_ pesticides, and duties related to correct use of PPE.

- A. Accessing to specific information
- B. Monitoring while handling highly toxic
- C. Avoiding inadvertent exposures
- D. Mitigating pesticide exposures
- E. None of the Above

281. These key terms have \_\_\_\_\_ in the WPS. Note that these definitions may be different from definitions found in other state and federal laws and regulations.

- A. Access to specific information
- B. Information on exposures to pesticides
- C. Very specific meanings
- D. Information on mitigating pesticide exposures
- E. None of the Above

282. Inform workers about \_\_\_\_\_ hazards by requiring safety training (workers and handlers), safety posters, access to labeling information, and access to specific information (listing of treated areas on the establishment).

- A. Pesticide
- B. Restricted entry intervals
- C. Hand labor
- D. WPS
- E. None of the Above

#### MITIGATION

283. Decontamination supplies — providing handlers and workers an ample supply of water, soap, and towels for routine washing and \_\_\_\_\_.

- A. In case of poisoning or injury
- B. That you a Worker are affected
- C. Specific meanings
- D. Emergency decontamination
- E. None of the Above

284. Emergency assistance — making transportation available to a medical care facility if an agricultural worker or handler may have been \_\_\_\_\_ by a pesticide, and providing information about the pesticide(s) to which the person may have been exposed.

- A. Poisoned or injured
- B. You are affected
- C. Specific meanings
- D. Emergency decontamination
- E. None of the Above

285. These key terms \_\_\_\_\_ in the WPS. Note that these definitions may be different from definitions found in other state and federal laws and regulations.

- A. Mean many things
- B. Through out the EPA and
- C. Have very specific meanings
- D. Cannot change
- E. None of the Above

#### Terms You Need to Know

These definitions will help you determine whether you are affected by the Worker Protection Standard.

286. \_\_\_\_\_: Plants grown or maintained for commercial or research purposes. Examples: food, feed, and fiber plants, trees, turfgrass, flowers, shrubs, ornamentals, and seedlings.

- A. Farms
- B. Agricultural plants
- C. Nurseries
- D. Greenhouses
- E. None of the Above

287. \_\_\_\_\_: Operations, other than nurseries or forests, that produce agricultural plants outdoors.

- A. Farms
- B. Agricultural plants
- C. Nurseries
- D. Greenhouses
- E. None of the Above

288. \_\_\_\_\_: Operations that produce agricultural plants outdoors for wood fiber or timber products.

- A. Farms
- B. Forests
- C. Agricultural plants
- D. Greenhouses
- E. None of the Above

289. \_\_\_\_\_: Operations that produce agricultural plants indoors in an area that is enclosed with nonporous covering and that is large enough to allow a person to enter.

- A. Farms
- B. Agricultural plants
- C. Nurseries
- D. Greenhouses
- E. None of the Above

290. Examples \_\_\_\_\_: polyhouses, mushroom houses and caves, and rhubarb houses, as well as traditional greenhouses.

- A. Farms
- B. Agricultural plants
- C. Nurseries
- D. Greenhouses
- E. None of the Above



291. \_\_\_\_\_ Malls, atriums, conservatories, arboretums, and office buildings that grow or maintain plants primarily for decorative or environmental benefits are not included.

- A. Farms
- B. Agricultural plants
- C. Nurseries
- D. Greenhouses
- E. None of the Above

292. \_\_\_\_\_: Operations that produce agricultural plants outdoors for transplants to another location, or flower or fern cuttings.

- A. Farms
- B. Agricultural plants
- C. Nurseries
- D. Greenhouses
- E. None of the Above

293. \_\_\_\_\_ Examples: flowering and foliage plants or trees; tree seedlings; live Christmas trees; vegetable, fruit, and ornamental transplants; and turfgrass produced for sod.

- A. Farms
- B. Agricultural plants
- C. Nurseries
- D. Greenhouses
- E. None of the Above

#### DOES THE WORKER PROTECTION STANDARD APPLY TO YOU?

You need the information in this section if:

294. You own or manage a farm, forest, nursery, or greenhouse where pesticides are used in the production of \_\_\_\_\_ plants.

- A. Crop advisor
- B. Agricultural
- C. Pesticide handlers
- D. Worker and an employer of workers
- E. None of the Above

295. Even if you are the owner of the farm, forest, nursery, or greenhouse and you or members of your family do all the work there, you are a "WPS \_\_\_\_\_." You must comply with some of the requirements described in this manual, such as restricted-entry intervals and personal protective equipment, and all the specific requirements listed in the pesticide labeling.

- A. Crop advisor
- B. Agricultural laborers
- C. Pesticide handlers
- D. Employer
- E. None of the Above

296. You hire or contract for the services of agricultural workers to do tasks related to the production of agricultural plants on a farm, forest, nursery, or greenhouse. This includes labor contractors and others who contract with growers to supply \_\_\_\_\_.

- A. Crop advisor
- B. Agricultural laborers
- C. Pesticide handlers
- D. Worker and an employer of workers
- E. None of the Above

297. You operate a business in which you (or people you employ) apply pesticides that are used for the production of \_\_\_\_\_ plants on any farm, forest, nursery, or greenhouse.

- A. Crop advisor
- B. Agricultural
- C. Pesticide handlers
- D. Worker and an employer of workers
- E. None of the Above

298. Commercial \_\_\_\_\_ and their employees are included with respect to such pesticides even if the pesticide handling task (mixing, loading, disposal, etc.) takes place somewhere other than the farm, forest, nursery, or greenhouse — at the commercial handling establishment or an airport hangar, for example.

- A. Crop advisor
- B. Agricultural laborers
- C. Pesticide handlers
- D. Worker and an employer of workers
- E. None of the Above

299. You operate a business in which you (or people you employ) perform tasks as a \_\_\_\_\_ on any farm, forest, nursery, or greenhouse.

- A. Crop advisor
- B. Agricultural laborers
- C. Pesticide handlers
- D. Worker and an employer of workers
- E. None of the Above

#### WHO DOES THE WPS PROTECT?

300. The WPS requires employers to take steps to protect two types of agricultural employees: workers and \_\_\_\_\_.

- A. Pesticide handlers
- B. Assisting with the application of pesticides
- C. Worker
- D. Immediate family
- E. None of the Above

You are finished with your assignment. Please fax, mail or e-mail your assignment along with your registration form and survey sheet. Always call later to ensure we've received the assignment.

Fax (928) 272-0747 e-mail [info@tlch2o.com](mailto:info@tlch2o.com)

Fax a copy of your driver's license too.

## Mosquito Control CEU Training Awareness Assignment #5 Last Names S to Z

You will have 90 days from the start of this course to have successfully passed this assignment with a score of 70 %. You may e mail the answers to TLC, info@tlch2o.com or fax the answers to TLC, (928) 272-0747. This assignment is available to you in a Word Format on TLC's Website. You can find online assistance for this course on the in the Search function on Adobe Acrobat PDF to help find the answers. Once you have paid the course fee, you will be provided complete course support from Student Services (928) 468-0665.

Assignment #1 for all pest applicators whose names start with the letter A- E.

Assignment #2 for all pest applicators whose last names start with F-K.

Assignment #3 for all pest applicators whose last name starts with the letter L-P.

Assignment #4 for all pest applicators whose last name starts with the letter Q-R.

Assignment #5 for all pest applicators whose last name starts with the letter S-Z.

### **Multiple Choice Section, One answer per question and please use the answer key.**

#### Agricultural Pesticide Section

1. All agricultural employers whose workers perform \_\_\_\_\_ operations in fields, forests, nurseries, and greenhouses treated with pesticides, and handle pesticides in these locations are covered by the U.S. Environmental Protection Agency's worker protection standard.

- A. Handle pesticides
- B. Restricted entry intervals
- C. Hand labor
- D. Exempt farming
- E. None of the Above

2. Owners, operators, and their immediate \_\_\_\_\_ must comply with some of the provisions of this standard. This supplement to "A Summary of Federal Laws and Regulations Affecting Agricultural Employers," summarizes this regulation.

- A. Handle pesticides
- B. Restricted entry intervals
- C. Hand labor
- D. Exempt farming
- E. None of the Above

3. The WPS covers every agricultural employer, including livestock producers, who have employees that perform hand labor operations in fields, forests, nurseries, and greenhouses treated with \_\_\_\_\_.

- A. Pesticides
- B. Restricted entry intervals
- C. Hand labor
- D. None of the Above

4. Unlike other laws and regulations affecting agricultural labor, the WPS does not exempt any employment in commercial agriculture involving \_\_\_\_\_ in fields, but owners or operators and immediate family members are specifically exempt from some provisions.
- A. Handle pesticides
  - B. Restricted entry intervals
  - C. Hand labor
  - D. Exempt farming
  - E. None of the Above
5. The WPS expands coverage to include more employees and expands employers' requirements for training employees who \_\_\_\_\_, protecting employees from pesticide exposure, and providing emergency assistance to exposed employees.
- A. Handle pesticides
  - B. Restricted entry intervals
  - C. Hand labor
  - D. Exempt farming
  - E. None of the Above
6. Many laws affecting agricultural employment \_\_\_\_\_ enterprises that employ small numbers of hired farmworkers, the new standard has no exemptions based on the number of employees.
- A. Handle pesticides
  - B. Restricted entry intervals
  - C. Hand labor
  - D. Exempt farming
  - E. None of the Above
7. Employers covered by the WPS must:  
Reduce overall exposure to pesticides by prohibiting handlers from exposing workers during pesticide application, excluding workers from areas being treated and areas under a \_\_\_\_\_, and notifying workers about treated areas.
- A. Handle pesticides
  - B. Restricted entry intervals
  - C. Hand labor
  - D. Exempt farming
  - E. None of the Above
8. Some activities are allowed during \_\_\_\_\_ if workers are properly trained and protected.
- A. Handle pesticides
  - B. Restricted entry intervals
  - C. Hand labor
  - D. Exempt farming
  - E. None of the Above
9. \_\_\_\_\_ by requiring decontamination supplies be present and emergency assistance be available.
- A. Handle pesticides
  - B. Restricted entry intervals
  - C. Mitigate exposures
  - D. WPS
  - E. None of the Above

10. Inform workers about \_\_\_\_\_ hazards by requiring safety training (workers and handlers), safety posters, access to labeling information, and access to specific information (listing of treated areas on the establishment).

- A. Pesticide
- B. Restricted entry intervals
- C. Hand labor
- D. WPS
- E. None of the Above

11. \_\_\_\_\_ provisions are very complicated and are likely to affect a large number of employers and their workers.

- A. Handle pesticides
- B. Restricted entry intervals
- C. WPS
- D. Exempt farming
- E. None of the Above

12. States may also issue worker protection standards that are stricter than the \_\_\_\_\_.

- A. Handle pesticides
- B. Restricted entry intervals
- C. WPS
- D. Exempt farming
- E. None of the Above

#### Background

13. The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) of 1947, as amended, sets an overall risk/benefit standard for pesticide registration, requiring that all pesticides perform their intended function, when used \_\_\_\_\_, without imposing unreasonable risks of adverse effects on human health or the environment.

- A. Mitigating exposures
- B. FIFRA
- C. Basic requirements
- D. According to labeling directions
- E. None of the Above

14. During the congressional discussion of FIFRA amendments in 1972, the Senate Committee on Agriculture and Forestry (Committee) "found protection of man and the environment to be a broad term encompassing farmers, farmworkers, and others who come into \_\_\_\_\_".

- A. Mitigating exposures
- B. FIFRA
- C. Basic requirements
- D. Contact with pesticides
- E. None of the Above

#### Four Basic Requirements

15. These regulations contained four \_\_\_\_\_: Workers are not to be sprayed with pesticides.

- A. Mitigating exposures
- B. FIFRA
- C. Basic requirements
- D. Agricultural plants
- E. None of the Above

16. There are specific \_\_\_\_\_ for 12 pesticides, interim restrictive entry levels for certain pesticides, and a general re-entry interval for all other agricultural pesticides prohibiting re-entry into treated areas until sprays have dried, dusts have settled, and vapors have dispersed.

- A. Mitigating exposures
- B. FIFRA
- C. Basic requirements
- D. Restricted entry intervals (REI)
- E. None of the Above

17. Protective clothing is required for any worker entering a treated area before the \_\_\_\_\_ has expired.

- A. Mitigating exposures
- B. Specific re-entry period
- C. Basic requirements
- D. Agricultural plants
- E. None of the Above

18. "Appropriate and timely" warnings are \_\_\_\_\_. These warnings may be given orally in appropriate language, placed on the pesticide notice board, or posted in the field.

- A. Mitigating exposures
- B. FIFRA
- C. Basic requirements
- D. Required for re-entry
- E. None of the Above

#### Mitigating Exposures

19. \_\_\_\_\_ will be accomplished by requiring decontamination supplies and emergency assistance.

- A. Mitigating exposures
- B. FIFRA
- C. Basic requirements
- D. Agricultural plants
- E. None of the Above

20. Workers will be informed about pesticide hazards through \_\_\_\_\_ (workers and handlers), safety posters, access to labeling information, and access to specific information (listing of treated areas on the establishment).

- A. Mitigating exposures
- B. FIFRA
- C. Basic requirements
- D. Required safety training
- E. None of the Above

#### Worker Protection Standard for Agricultural Pesticides

Provisions of the WPS apply to:

21. Owners or managers of farms, forests, nurseries, or greenhouses where pesticides are used in the production of \_\_\_\_\_.

- A. Agricultural workers
- B. Agricultural plants
- C. Agricultural employer
- D. Worker or handler
- E. None of the Above

22. Those who hire or contract for services of agricultural workers to do tasks related to the production of \_\_\_\_\_ on a farm, forest, nursery, or greenhouse.

- A. Agricultural workers
- B. Agricultural plants
- C. Agricultural employer
- D. Worker or handler
- E. None of the Above

#### General Duties of WPS

The general duties of the WPS require an agricultural employer or a pesticide handler-employer to:

23. Assure that each \_\_\_\_\_ subject to the standard receives the required protections.

- A. Agricultural workers
- B. Agricultural plants
- C. Agricultural employer
- D. Worker or handler
- E. None of the Above

24. Assure that any \_\_\_\_\_ to the standard is used in a manner consistent with the labeling of the pesticide, including the requirements in the standard.

- A. Agricultural workers
- B. Agricultural plants
- C. Agricultural employer
- D. Worker or handler
- E. None of the Above

25. Provide sufficient information and directions to each person who supervises any \_\_\_\_\_ to assure that each worker or handler receives the required protection.

- A. Agricultural workers
- B. Agricultural plants
- C. Agricultural employer
- D. Worker or handler
- E. None of the Above

26. The \_\_\_\_\_ must specify which persons are responsible for actions required to comply with the standard.

- A. Agricultural workers
- B. Agricultural plants
- C. Agricultural employer
- D. Worker or handler
- E. None of the Above

27. Require each person who supervises any \_\_\_\_\_ to assure compliance by the worker or handler with the provisions of this standard and to assure that the worker or handler receives the required protection (40 CFR).

- A. Agricultural workers
- B. Agricultural plants
- C. Agricultural employer
- D. Worker or handler
- E. None of the Above

28. The general duties also prohibit agricultural and handler employers from taking any retaliatory actions against workers attempting to comply with this standard, or from taking any action that prevents or discourages any \_\_\_\_\_ from complying or attempting to comply with the WPS.

- A. Agricultural workers
- B. Agricultural plants
- C. Agricultural employer
- D. Worker or handler
- E. None of the Above

#### Labeling

29. Requires everyone \_\_\_\_\_ to obey instructions printed on the pesticide container's label.

- A. Notification to workers
- B. Restricted-entry intervals
- C. Applying pesticides
- D. Personal protective equipment
- E. None of the Above

#### Summary of WPS Requirements

30. Protection during applications -- Applicators are prohibited from applying a pesticide in a way that will expose workers or other persons. \_\_\_\_\_ are excluded from areas while pesticides are being applied.

- A. Workers
- B. Restricted-entry intervals
- C. Emergency assistance
- D. Personal protective equipment
- E. None of the Above

31. \_\_\_\_\_ must be specified on all agricultural plant pesticide product labels.

- A. Notification to workers
- B. Restricted-entry intervals
- C. Emergency assistance
- D. Personal protective equipment
- E. None of the Above

32. Workers are excluded from entering a pesticide-treated area during the \_\_\_\_\_, with only narrow exceptions.

- A. Notification to workers
- B. Restricted-entry intervals
- C. Emergency assistance
- D. Personal protective equipment
- E. None of the Above

33. \_\_\_\_\_ -- Personal protective equipment must be provided and maintained for handlers and early-entry workers.

- A. Notification to workers
- B. Restricted-entry intervals
- C. Emergency assistance
- D. Personal protective equipment
- E. None of the Above



34. \_\_\_\_\_ -- Workers must be notified about treated areas so they may avoid inadvertent exposures.
- A. Notification to workers
  - B. Restricted-entry intervals
  - C. Emergency assistance
  - D. Personal protective equipment
  - E. None of the Above
35. \_\_\_\_\_ -- Handlers and workers must have an ample supply of water, soap, and towels for routine washing and emergency decontamination.
- A. Notification to workers
  - B. Decontamination supplies
  - C. Emergency assistance
  - D. Personal protective equipment
  - E. None of the Above
36. \_\_\_\_\_ Transportation must be made available to a medical care facility if a worker or handler may have been poisoned or injured. Information must be provided about the pesticide to which the person may have been exposed.
- A. Notification to workers
  - B. Restricted-entry intervals
  - C. Emergency assistance
  - D. Personal protective equipment
  - E. None of the Above
37. \_\_\_\_\_ -- Training is required for all workers and handlers, and a pesticide safety poster must be displayed.
- A. Notification to workers
  - B. Pesticide safety training and safety posters
  - C. Emergency assistance
  - D. Central posting
  - E. None of the Above
38. Access to labeling and site-specific information -- Handlers and workers must be informed of pesticide label requirements. \_\_\_\_\_ of recent pesticide applications is required.
- A. Notification to workers
  - B. Pesticide safety training and safety posters
  - C. Emergency assistance
  - D. Central posting
  - E. None of the Above
39. \_\_\_\_\_ used on sod farms are covered by WPS.
- A. Agricultural Use Requirements
  - B. Pesticides
  - C. Restricted-entry interval (REI)
  - D. Agricultural establishment
  - E. None of the Above

40. Some pesticide uses are not covered by WPS, even when the \_\_\_\_\_ section is on the labeling.

- A. Agricultural Use Requirements
- B. Pesticide applications
- C. Restricted-entry interval (REI)
- D. Agricultural establishment
- E. None of the Above

41. If the pesticide labeling bears an \_\_\_\_\_ section, but the product also can be applied to rights-of-way, the rights-of-way use is not covered by WPS.

- A. Agricultural Use Requirements
- B. Pesticide applications
- C. Restricted-entry interval (REI)
- D. Agricultural establishment
- E. None of the Above

WPS Requires Restricted Entry to Treated Areas

42. \_\_\_\_\_ is the time immediately after a pesticide application when entry into the treated area is prohibited or very limited.

- A. Agricultural Use Requirements
- B. Pesticide applications
- C. Restricted-entry interval (REI)
- D. Agricultural establishment
- E. None of the Above

43. \_\_\_\_\_ are established for all pesticides used in the production of agricultural plants depending on toxicity.

- A. Agricultural Use Requirements
- B. Pesticide applications
- C. Restricted-entry interval (REI)
- D. Agricultural establishment
- E. None of the Above

44. The REI is listed on the pesticide labeling under the heading “\_\_\_\_\_” in the “Directions for Use” section of the pesticide labeling or next to the crop or application method to which it applies.

- A. Agricultural Use Requirements
- B. Pesticide applications
- C. Restricted-entry interval (REI)
- D. Agricultural establishment
- E. None of the Above

45. \_\_\_\_\_ must be specified on all agricultural plant pesticide product labels.

- A. Agricultural Use Requirements
- B. Pesticide applications
- C. Restricted-entry interval (REI)
- D. Agricultural establishment
- E. None of the Above

46. Workers are excluded from entering a pesticide treated area during \_\_\_\_\_, with few narrow exceptions.
- A. Agricultural Use Requirements
  - B. Pesticide applications
  - C. Restricted-entry interval (REI)
  - D. Agricultural establishment
  - E. None of the Above
47. The duration of \_\_\_\_\_ ranges from 4 hours to several days. Some pesticides have one REI, such as 12 hours, for all crops and uses.
- A. Agricultural Use Requirements
  - B. Pesticide applications
  - C. Restricted-entry interval (REI)
  - D. None of the Above
48. Other products have different \_\_\_\_\_, depending on the crop or method of application.
- A. Agricultural Use Requirements
  - B. Pesticide applications
  - C. Restricted-entry interval (REI)
  - D. Agricultural establishment
  - E. None of the Above
49. There is a \_\_\_\_\_ for 4 hours for all products with WPS labeling; this means no early entry.
- A. Agricultural Use Requirements
  - B. Pesticide applications
  - C. Restricted-entry interval (REI)
  - D. No-entry period
  - E. None of the Above
50. \_\_\_\_\_ mosquitoes are ready to bite one to two days after adult emergence.
- A. Culex
  - B. Larvae
  - C. Female
  - D. Male
  - E. None of the Above
51. \_\_\_\_\_ mosquitoes do not bite but feed on flower nectar or plant juices. Some mosquitoes have only one generation per year, whereas others may have four or more.
- A. Culex
  - B. Larvae
  - C. Female
  - D. Male
  - E. None of the Above
52. \_\_\_\_\_ may fly 5 to 10 miles, but usually rest in grass, shrubbery, or other foliage close to the water breeding area.
- A. Culex
  - B. Larvae
  - C. Adults
  - D. Male
  - E. None of the Above

Mosquito Habitats

53. Few mosquito species in the U.S. breed in \_\_\_\_\_, such as streams.
- A. Running waters
  - B. Stream volume
  - C. Stream breeders
  - D. Along banks
  - E. None of the Above
54. Larvae can be flushed out when \_\_\_\_\_ increases, and to remain in the stream requires a large amount of energy.
- A. Running waters
  - B. Stream volume
  - C. Stream breeders
  - D. Along banks
  - E. None of the Above
55. The tropical genus *Chagasia* and some *Anopheles* species are \_\_\_\_\_. In addition, *Anopheles quadrimaculatus*, *Culex territans*, and *Uranotaenia sapphirina* have all been found in streams, although they prefer other habitats.
- A. Running waters
  - B. Stream volume
  - C. Stream breeders
  - D. Along banks
  - E. None of the Above
56. Stream breeders will find vegetation \_\_\_\_\_ with which to anchor themselves or attempt to remain away from the main flow of the stream by seeking isolated eddies.
- A. Running waters
  - B. Stream volume
  - C. Stream breeders
  - D. Along banks
  - E. None of the Above
57. Transient water sources, such as \_\_\_\_\_, snowpools, and ditches, are used as breeding grounds for mosquito species whose eggs can withstand desiccation, such as *Aedes* and *Psorophora*.
- A. Running waters
  - B. Stream volume
  - C. Stream breeders
  - D. Flooded areas
  - E. None of the Above
58. Their life cycles require alternating periods of wet and dry. Other species, like an opportunistic *Culex*, might be able to pull off a single generation during an extended \_\_\_\_\_.
- A. Running waters
  - B. Stream volume
  - C. Flooded period
  - D. Along banks
  - E. None of the Above

59. \_\_\_\_\_ generally shows water quality changes which result in various mosquito species using the same pool over a period of time.
- A. Running waters
  - B. Transient water
  - C. Stream breeders
  - D. Along banks
  - E. None of the Above
60. Genera associated with \_\_\_\_\_ are Anopheles, Culex, Culiseta, Coquillettidia, and Uranotaenia.
- A. Running waters
  - B. Stream volume
  - C. Stream breeders
  - D. Permanent water
  - E. None of the Above
61. Eggs of these species are not desiccant-resistant and must be laid directly \_\_\_\_\_.
- A. Running waters
  - B. On the water
  - C. Stream breeders
  - D. None of the Above
62. As with transient waters, there is a seasonal change in the vegetation, \_\_\_\_\_, and mosquito species present.
- A. Water quality
  - B. Stream volume
  - C. Breeders
  - D. Along banks
  - E. None of the Above
63. Culiseta are found in \_\_\_\_\_ formed by pockets of water surrounding tree roots.
- A. Running waters
  - B. Stream volume
  - C. Crypts
  - D. Along banks
  - E. None of the Above

Containers

64. \_\_\_\_\_ sites generally have tannin-enriched water, which is characteristically clear, with rotting wood at the bottom.
- A. Treehole
  - B. Insulation
  - C. Containers
  - D. Artificial
  - E. None of the Above
65. Many \_\_\_\_\_ species now also use artificial sites, such as tires, since they provide insulation against the weather and are more numerous.
- A. Treehole
  - B. Insulation
  - C. Containers
  - D. Artificial
  - E. None of the Above

66. Artificial \_\_\_\_\_ are a convenient mode of transporting a species of mosquito outside of its natural range.
- A. Treehole
  - B. Insulation
  - C. Containers
  - D. Artificial
  - E. None of the Above

Mosquito Control Section

67. The mission of the Environmental Protection Agency (EPA) is to \_\_\_\_\_ and the environment.
- A. Protect human health
  - B. Minimize the risk of human exposure
  - C. Conduct surveillance for diseases
  - D. Evaluating larval populations
  - E. None of the Above

68. The EPA reviews and approves pesticides and their labeling to ensure that the pesticides used to protect public health are applied by methods which \_\_\_\_\_ and adverse health and environmental effects.
- A. Protect human health
  - B. Minimize the risk of human exposure
  - C. Conduct surveillance for diseases
  - D. None of the Above

How Are Mosquitoes Controlled with Pesticides and Other Methods?

69. The first step in mosquito control is surveillance. Mosquito specialists \_\_\_\_\_ harbored by domestic and nonnative birds, including sentinel chickens (used as virus transmission indicators), and mosquitoes.
- A. Protect human health
  - B. Minimize the risk of human exposure
  - C. Conduct surveillance for diseases
  - D. None of the Above

70. Surveillance for larval habitats is conducted by using maps and aerial photographs, and by \_\_\_\_\_.
- A. Protect human health
  - B. Minimize the risk of human exposure
  - C. Conduct surveillance for diseases
  - D. Evaluating larval populations
  - E. None of the Above

71. Other techniques include various light traps, biting counts, and \_\_\_\_\_.
- A. Protect human health
  - B. Minimize the risk of human exposure
  - C. Analysis of reports from the public
  - D. Evaluating larval populations
  - E. None of the Above

72. Mosquito control programs also put high priority on trying to \_\_\_\_\_, so that additional controls may not be necessary.

- A. Protect human health
- B. Minimize the risk of human exposure
- C. Conduct surveillance for diseases
- D. Prevent a large population of adult mosquitoes from developing
- E. None of the Above

73. Since mosquitoes must have water to breed, methods of prevention may include controlling water levels in lakes, marshes, ditches, or other mosquito breeding sites, \_\_\_\_\_ if possible, and stocking bodies of water with fish species that feed on larvae.

- A. Eliminating small breeding sites
- B. Minimize the risk of human exposure
- C. Conduct surveillance for diseases
- D. Evaluating larval populations
- E. None of the Above

74. Both chemical and biological measures may be employed to \_\_\_\_\_ during larval stages.

- A. Protect human health
- B. Minimize the risk of human exposure
- C. Conduct surveillance for diseases
- D. Kill immature mosquitoes
- E. None of the Above

#### Larvicides

75. \_\_\_\_\_ target larvae in the breeding habitat before they can mature into adult mosquitoes and disperse.

- A. Larvicides
- B. Mineral oils
- C. Liquid
- D. None of the Above

76. \_\_\_\_\_ include the bacterial insecticides *Bacillus thuringiensis israelensis* and *Bacillus sphaericus*, the insect growth inhibitor methoprene, and the organophosphate insecticide temephos.

- A. Larvicides
- B. Mineral oils
- C. Liquid
- D. Mosquito controllers
- E. None of the Above

77. \_\_\_\_\_ and other materials form a thin film on the surface of the water, which cause larvae and pupae to drown.

- A. Larvicides
- B. Mineral oils
- C. Liquid
- D. Mosquito controllers
- E. None of the Above

78. \_\_\_\_\_ larvicide products are applied directly to water using backpack sprayers and truck or aircraft-mounted sprayers. Tablet, pellet, granular, and briquette formulations of larvicides are also applied by mosquito controllers to breeding areas.

- A. Larvicides
- B. Mineral oils
- C. Liquid
- D. Mosquito controllers
- E. None of the Above

Methoprene (Altosid XR)

79. Methoprene (Altosid XR) is another safe material for control of mosquito larvae. It is an insect hormone that \_\_\_\_\_ of larvae (disrupts molting) and prevents mosquitoes from developing into adults.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Labeled for use in known fish habitats
- E. None of the Above

Altosid XR Briquettes

80. Altosid XR Briquettes \_\_\_\_\_. Treat swamps, ponds, and marsh areas in early spring before thawing.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Labeled for use in known fish habitats
- E. None of the Above

81. These extended-release briquettes will provide up to \_\_\_\_\_ once they hit the water.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Labeled for use in known fish habitats
- E. None of the Above

82. They can be applied by hand and the product is \_\_\_\_\_.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Labeled for use in known fish habitats
- E. None of the Above

Microbial insecticides

83. The product known as Bti (*Bacillus thuringiensis israeliensis*) can be as effective as chemical insecticides. When the bacteria Bti encysts, \_\_\_\_\_.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. It produces a protein crystal toxic to mosquito and midge larvae
- D. Labeled for use in known fish habitats
- E. None of the Above



84. Once the bacterium has been ingested, \_\_\_\_\_. It has no effect on a vast array of other aquatic organisms except midges in the same habitat. Bti strains are sold under the names Bactimos, Teknar and Vectobac.
- A. Retards the development
  - B. Can be placed even on ice for season-long control
  - C. 150 days of uninterrupted mosquito control
  - D. The toxin disrupts the lining of the larvae's intestine
  - E. None of the Above

#### Mosquito Dunks or Briquettes

85. Product Description: \_\_\_\_\_ objects that release bacteria into water where mosquitoes are breeding. When the larvae feed on the bacteria, they die.
- A. Small donut shaped and sized
  - B. Can be placed even on ice for season-long control
  - C. 150 days of uninterrupted mosquito control
  - D. Labeled for use in known fish habitats
  - E. None of the Above

#### Juvenile Hormone

86. Methoprene (sold under the name Altosid) is an insect growth regulator widely used by abatement districts to \_\_\_\_\_.
- A. Retards the development
  - B. Can be placed even on ice for season-long control
  - C. Control mosquito larvae
  - D. Labeled for use in known fish habitats
  - E. None of the Above

87. Methoprene \_\_\_\_\_, and when present in the larval habitat, it keeps immature insects from maturing into adults.
- A. Retards the development
  - B. Can be placed even on ice for season-long control
  - C. Mimics a natural juvenile hormone
  - D. Labeled for use in known fish habitats
  - E. None of the Above

88. Unable to metamorphose, the mosquitoes \_\_\_\_\_.
- A. Retards the development
  - B. Can be placed even on ice for season-long control
  - C. Die in the pupal stage
  - D. None of the Above

89. Vector control technicians sometimes use methoprene to reach larval sources that would \_\_\_\_\_.
- A. Retards the development
  - B. Can be placed even on ice for season-long control
  - C. Otherwise be difficult or dangerous to treat
  - D. Labeled for use in known fish habitats
  - E. None of the Above

90. Pellets \_\_\_\_\_ into underground septic tanks known to be breeding house mosquitoes.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Can be flushed down toilets
- E. None of the Above

91. The methoprene kills the mosquitoes without upsetting the septic system's \_\_\_\_\_.

- A. Retards the development
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Bacterial digestive processes
- E. None of the Above

#### Larvicidal Oils

92. Oils have been used for mosquito control for more than a century. The Marin / Sonoma District in California uses \_\_\_\_\_, a light-viscosity oil that spreads quickly and evenly over the water surface, preventing larvae and pupae from obtaining oxygen through the surface film.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

93. \_\_\_\_\_ have always been used as a product of last resort for the control of mosquito pupae, since this stage does not feed but does require oxygen. The only other option would be draining the source.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

#### Chemical Larvicides

94. Chlorinated hydrocarbons like DDT and \_\_\_\_\_ are very much a thing of the past, as are the use of organophosphate and carbamate insecticides.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

95. \_\_\_\_\_ were removed from the US market in 1964, and in 1987.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

Adulticides

96. \_\_\_\_\_ control may be undertaken to combat an outbreak of mosquito-borne disease or a very heavy nuisance infestation of mosquitoes in a community.
- A. Golden Bear 1111
  - B. Oils
  - C. Chlorinated hydrocarbons
  - D. Chlordane
  - E. None of the Above
97. Pesticides registered for this use are \_\_\_\_\_ and are applied either by aircraft or on the ground, employing truck-mounted sprayers.
- A. Golden Bear 1111
  - B. Oils
  - C. Chlorinated hydrocarbons
  - D. Adulticides
  - E. None of the Above
98. State and local agencies commonly use the \_\_\_\_\_ Malathion and Naled and the synthetic pyrethroid insecticides Permethrin, Resmethrin, and Sumithrin for adult mosquito control.
- A. Golden Bear 1111
  - B. Oils
  - C. Organophosphate insecticides
  - D. Chlordane
  - E. None of the Above
99. Mosquito adulticides are applied as \_\_\_\_\_ sprays. Ultra-low volume (ULV) sprayers dispense very fine aerosol droplets that stay aloft and kill flying mosquitoes on contact.
- A. Golden Bear 1111
  - B. Oils
  - C. Ultra-low volume (ULV)
  - D. Chlordane
  - E. None of the Above
100. \_\_\_\_\_ applications involve small quantities of pesticide active ingredient in relation to the size of the area treated, typically less than 3 ounces per acre, which minimizes exposure and risks to people and the environment.
- A. Golden Bear 1111
  - B. ULV
  - C. Chlorinated hydrocarbons
  - D. Chlordane
  - E. None of the Above
101. Chemical Control of Adult Mosquitoes  
Because of environmental concerns and drift, \_\_\_\_\_ are not the most popular method.
- A. Golden Bear 1111
  - B. Oils
  - C. Chlorinated hydrocarbons
  - D. Chemical pesticides
  - E. None of the Above

102. Chemical pesticides, the technique used for adult mosquito control is known as \_\_\_\_\_ spray.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

103. A small quantity of the pesticide is \_\_\_\_\_ and broadcast in a fog that drifts into sites where the adult mosquitoes hide. At best, control is achieved up to 300 feet away, but it does help reduce the numbers of biting mosquitoes to tolerable levels.

- A. Aerosol bombs
- B. Hand-carried dispersal units
- C. ULV spraying
- D. Atomized into micron-size particles
- E. None of the Above

104. In recent years the use of vehicle-mounted units has decreased in favor of small, \_\_\_\_\_. This allows a more precise application of the pesticide.

- A. Aerosol bombs
- B. Hand-carried dispersal units
- C. ULV spraying
- D. Aerosol foggers
- E. None of the Above

105. The pesticide used for \_\_\_\_\_ is pyrethrum (sold as Pyrocide), a naturally occurring substance harvested from two species of Old World chrysanthemums, or pyrethrum flowers.

- A. Aerosol bombs
- B. Hand-carried dispersal units
- C. ULV spraying
- D. Aerosol foggers
- E. None of the Above

106. This material is the \_\_\_\_\_ for mosquito control, and it degrades into non-toxic by-products within 4 to 6 hours after spraying.

- A. Aerosol bombs
- B. Hand-carried dispersal units
- C. Least toxic available
- D. Aerosol foggers
- E. None of the Above

#### Indoor Control

107. Space sprays or aerosol "bombs," containing synergized pyrethrins 0.1%, are effective against adult mosquitoes. \_\_\_\_\_ may be needed during problem periods.

- A. Frequent treatments
- B. Temporary treatment
- C. One to two days of treatment
- D. Residual treatment
- E. None of the Above

Outdoor Control Adulticides

108. Space sprays or aerosol foggers containing pyrethrins result in rapid knockdown of adult mosquitoes. However, it is a \_\_\_\_\_ with little residual effect.

- A. Frequent treatments
- B. Temporary treatment
- C. One to two days of treatment
- D. Residual treatment
- E. None of the Above

109. \_\_\_\_\_ applied to tall grasses, weeds, trees, shrubs, and outbuildings, one to two days before use of the area, are effective.

- A. Frequent treatments
- B. Temporary treatment
- C. One to two days of treatment
- D. Residual sprays
- E. None of the Above

110. Some insecticides registered for residual mosquito control include: \_\_\_\_\_, chlorpyrifos (Dursban), and Malathion.

- A. Carbaryl (Sevin)
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

111. Malathion and \_\_\_\_\_ are extremely toxic to honey bees. Do not spray plants when in bloom. Mow weedy areas before treatment.

- A. Chlorinated hydrocarbons
- B. Oils
- C. Carbaryl (Sevin)
- D. Chlordane
- E. None of the Above

112. Bee losses are minimized by spraying late in the afternoon when bees are gone or when temperatures are below 45°F. \_\_\_\_\_ and methoxychlor are highly toxic to fish.

- A. Chlorinated hydrocarbons
- B. Oils
- C. Carbaryl (Sevin)
- D. Malathion
- E. None of the Above

Mosquito fish (*Gambusia affinis*)

113. Mosquito fish can eat \_\_\_\_\_ per day. They play an important role in mosquito control in ponds, canals, irrigated fields, and some other freshwater sources.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. Encephalitis
- D. Deet
- E. None of the Above

114. The fish live two to three years; they are live-bearing and produce \_\_\_\_\_ each year.
- A. 100 to 500 larvae
  - B. 3 to 4 broods
  - C. Encephalitis
  - D. Deet
  - E. None of the Above

#### Repellents

115. Repellents applied to the skin and clothing will prevent mosquito bites for \_\_\_\_\_ depending on the person, type, number of mosquitoes, and the type and percent of active ingredient in the repellent.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. One to five hours
- D. Deet
- E. None of the Above

116. N, N-Diethyl-m-toluamide (Deet) is very effective and widely used as a \_\_\_\_\_, but it should not be used indiscriminately, as severe allergies can develop.

- A. Frequent treatments
- B. Temporary treatment
- C. One to two days of treatment
- D. Residual treatment
- E. None of the Above

#### Prevention

117. Since most of the mosquitoes that transmit \_\_\_\_\_ will not travel very far, the risk of contracting \_\_\_\_\_ can be minimized by controlling the mosquito breeding sites that are in close proximity to your home.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. Encephalitis
- D. Deet
- E. None of the Above

118. Water management, to prevent mosquito breeding, is essential for control. Eggs do not hatch unless they are \_\_\_\_\_.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. In water
- D. Deet
- E. None of the Above

#### Pesticides and Mosquito Control Summary

119. Mosquito-borne diseases affect millions of people worldwide each year. In the United States, some species of mosquitoes can transmit diseases such as \_\_\_\_\_, dengue fever, and malaria to humans, and a variety of diseases to wildlife and domestic animals.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Encephalitis
- D. Human exposure
- E. None of the Above

120. To combat mosquitoes and the public health hazards they present, many states and localities have established \_\_\_\_\_.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Mosquito control programs
- D. Human exposure
- E. None of the Above

121. These programs, which are based on \_\_\_\_\_, can include non-chemical forms of prevention and control, as well as ground and aerial application of chemical and biological pesticides.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Encephalitis
- D. Human exposure
- E. None of the Above

122. The mission of the Environmental Protection Agency (EPA) is to protect \_\_\_\_\_ and the environment.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Human health
- D. Human exposure
- E. None of the Above

123. The EPA reviews and approves pesticides and their labeling to ensure that the pesticides used to protect \_\_\_\_\_ are applied by methods that minimize the risk of human exposure and adverse health and environmental effects.

- A. Public health
- B. Infectious diseases
- C. Encephalitis
- D. Human exposure
- E. None of the Above

124. In relation to mosquito control, the Agency also serves as a source of information about pesticide and \_\_\_\_\_ to address the concerns of the general public, news media, and the state and local agencies dealing with outbreaks of infectious diseases or heavy infestations of mosquitoes.

- A. Non-pesticide controls
- B. Infectious diseases
- C. Encephalitis
- D. Human exposure
- E. None of the Above

#### Malathion for Mosquito Control

125. Officials responsible for mosquito control programs make decisions to use pesticides based on an evaluation of the \_\_\_\_\_ from diseases transmitted by mosquitoes or on an evaluation of the nuisance level that communities can tolerate from a mosquito infestation.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Risks to the general public
- D. Human exposure
- E. None of the Above

126. Based on \_\_\_\_\_, mosquito control officials select specific pesticides and other control measures that best suit local conditions in order to achieve effective control of mosquitoes with the least impact on human health and the environment.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Surveillance and monitoring
- D. Human exposure
- E. None of the Above

127. It is especially important to conduct effective \_\_\_\_\_ by eliminating breeding habitats or applying pesticides to control the early life stages of the mosquito.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Mosquito prevention programs
- D. Human exposure
- E. None of the Above

128. \_\_\_\_\_, such as elimination of any standing water that could serve as a breeding site, help reduce the adult mosquito population and the need to apply other pesticides for adult mosquito control.

- A. Prevention programs
- B. Infectious diseases
- C. Encephalitis
- D. Human exposure
- E. None of the Above

129. Since no pesticide can be considered 100 percent safe, pesticide applicators and the general public should always exercise care and follow specified \_\_\_\_\_ during use to reduce risks.

- A. Mosquito-borne diseases
- B. Infectious diseases
- C. Safety precautions
- D. Human exposure
- E. None of the Above

What is Malathion?

130. Malathion is an organophosphate (OP) \_\_\_\_\_ that has been registered for use in the United States since 1956.

- A. Insecticide
- B. To kill mosquitoes
- C. Kill adult mosquitoes
- D. Larva
- E. None of the Above

131. When applied in accordance with the rate of application and safety precautions specified on the label, Malathion can be used \_\_\_\_\_ without posing unreasonable risks to human health or the environment.

- A. Insecticide
- B. To kill mosquitoes
- C. Kill adult mosquitoes
- D. Larva
- E. None of the Above



How is Malathion Used in Mosquito Control?

132. The mosquito goes through four distinct stages during its life cycle: egg, larva, pupa, and adult. Malathion is an adulticide, used to \_\_\_\_\_.

- A. Insecticide
- B. To kill mosquitoes
- C. Kill adult mosquitoes
- D. Larva
- E. None of the Above

133. In mosquito control programs conducted by state or local authorities, Malathion is applied by truck-mounted or \_\_\_\_\_.

- A. Insecticide
- B. Aircraft-mounted sprayers
- C. Kill adult mosquitoes
- D. Ultra-low volume (ULV) spray
- E. None of the Above

134. Malathion is applied as an \_\_\_\_\_. Ultra-low volume (ULV) sprayers dispense very fine aerosol droplets that stay aloft and kill mosquitoes on contact.

- A. Insecticide
- B. Aircraft-mounted sprayers
- C. Kill adult mosquitoes
- D. Ultra-low volume (ULV) spray
- E. None of the Above

135. For mosquito control, Malathion is applied at a maximum rate of 0.23 pounds (or about 2.5 fluid ounces) of active ingredient per acre, which \_\_\_\_\_ exposure and risks to people and the environment.

- A. Minimizes
- B. Kill mosquitoes
- C. Maximizes
- D. Kill larva
- E. None of the Above

136. Malathion can be used for \_\_\_\_\_ programs without posing unreasonable risks to the general population when applied according to the label.

- A. Public health mosquito control
- B. Adults and children
- C. Small amount of active ingredient
- D. Skin and inhalation exposure
- E. None of the Above

137. The EPA has estimated the exposure and risks to both \_\_\_\_\_ posed by ULV aerial and ground applications of Malathion.

- A. Public health mosquito control
- B. Adults and children
- C. Small amount of active ingredient
- D. Skin and inhalation exposure
- E. None of the Above

138. Because of the very \_\_\_\_\_ released per acre of ground, the estimates found that for all scenarios considered, exposures were hundreds or even thousands of times below an amount that might pose a health concern.

- A. Public health mosquito control
- B. Adults and children
- C. Small amount of active ingredient
- D. Skin and inhalation exposure
- E. None of the Above

139. These estimates assumed several spraying events over a period of weeks, and also assumed that a toddler would ingest some soil and grass in addition to \_\_\_\_\_.

- A. High-dose poisoning
- B. Nausea, dizziness, or confusion
- C. Small amount of active ingredient
- D. Skin and inhalation exposure
- E. None of the Above

140. At high doses, Malathion, like other organophosphates, can overstimulate the nervous system, causing \_\_\_\_\_.

- A. High-dose poisoning
- B. Nausea, dizziness, or confusion
- C. Small amount of active ingredient
- D. Skin and inhalation exposure
- E. None of the Above

141. Severe \_\_\_\_\_ with any organophosphate can cause convulsions, respiratory paralysis, and death.

- A. Public health mosquito control
- B. Adults and children
- C. High-dose poisoning
- D. Skin and inhalation exposure
- E. None of the Above

142. Malathion used in mosquito control programs does not pose unreasonable \_\_\_\_\_ or the environment.

- A. Risks to wildlife
- B. Low toxicity
- C. Toxic to insects
- D. To reduce risks
- E. None of the Above

143. Malathion degrades rapidly in the environment, especially in moist soil, and it displays \_\_\_\_\_ to birds and mammals.

- A. Risks to wildlife
- B. Low toxicity
- C. Toxic to insects
- D. To reduce risks
- E. None of the Above

144. Malathion is highly \_\_\_\_\_, including beneficial insects such as honeybees.

- A. Risks to wildlife
- B. Low toxicity
- C. *Toxic to insects*
- D. To reduce risks
- E. None of the Above

145. For that reason, the EPA has established specific precautions on the label to reduce such \_\_\_\_\_.

- A. *Risks*
- B. Low toxicity
- C. *Toxic to insects*
- D. To reduce risks
- E. None of the Above

#### Larvicides For Mosquito Control

146. Prevention programs, such as the elimination of any standing water that could serve as a breeding site, help reduce the adult \_\_\_\_\_ and the need to apply other pesticides for adult mosquito control.

- A. Risks to wildlife
- B. Mosquito population
- C. Toxic to insects
- D. To reduce risks
- E. None of the Above

147. Since no pesticide can be considered 100 percent safe, pesticide applicators and the general public should always exercise care and follow specified safety precautions during use \_\_\_\_\_.

- A. Risks to wildlife
- B. Low toxicity
- C. Toxic to insects
- D. To reduce risks
- E. None of the Above

#### Larvicides

148. Larvicides kill mosquito larvae. Larvicides include \_\_\_\_\_, such as the microbial larvicides *Bacillus sphaericus* and *Bacillus thuringiensis israelensis*.

- A. Biological insecticides
- B. Adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Pesticide usage
- E. None of the Above

149. Larvicides include other pesticides, such as temephos, methoprene, oils, and monomolecular films. Larvicide treatment of breeding habitats help reduce the \_\_\_\_\_ in nearby areas.

- A. Biological insecticides
- B. Adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Pesticide usage
- E. None of the Above

How are Larvicides Used in Mosquito Control?

150. State and local agencies in charge of mosquito control typically employ a variety of techniques in an \_\_\_\_\_ program.

- A. Biological insecticides
- B. Adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Pesticide usage
- E. None of the Above

151. An IPM approach includes surveillance, \_\_\_\_\_, larviciding, and adulticiding to control mosquito populations.

- A. Biological insecticides
- B. Adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Source reduction
- E. None of the Above

152. Since mosquitoes must have water to breed, source reduction can be as simple as turning over trapped water in a container to undertaking large-scale \_\_\_\_\_ of marsh water levels.

- A. Engineering and management
- B. Adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Pesticide usage
- E. None of the Above

153. Larviciding involves applying pesticides to breeding habitats to kill mosquito larvae.

Larviciding can reduce overall \_\_\_\_\_ in a control program.

- A. Biological insecticides
- B. Adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Pesticide usage
- E. None of the Above

154. Killing mosquito larvae before they emerge as adults can reduce or \_\_\_\_\_ the need for ground or aerial application of pesticides to kill adult mosquitoes.

- A. Biological insecticides
- B. Adult mosquito population
- C. Integrated Pest Management (IPM)
- D. Eliminate
- E. None of the Above

What are Microbial Larvicides?

155. \_\_\_\_\_ are bacteria that are registered as pesticides for control of mosquito larvae in outdoor areas such as irrigation ditches, flood water, standing ponds, woodland pools, pastures, tidal water, fresh or saltwater marshes, and storm water retention areas.

- A. Microbial larvicides
- B. Mosquito species
- C. *Bacillus thuringiensis israelensis* (Bti)
- D. Naturally occurring soil bacterium
- E. None of the Above

156. Duration of effectiveness depends primarily on the \_\_\_\_\_, the environmental conditions, the formulation of the product, and water quality.
- A. Microbial larvicides
  - B. Mosquito species
  - C. *Bacillus thuringiensis israelensis* (Bti)
  - D. Naturally occurring soil bacterium
157. \_\_\_\_\_ may be used along with other mosquito control measures in an IPM program.
- A. Microbial larvicides
  - B. Mosquito species
  - C. *Bacillus thuringiensis israelensis* (Bti)
  - D. Naturally occurring soil bacterium
  - E. None of the Above
158. The microbial larvicides used for mosquito control are \_\_\_\_\_ and *Bacillus sphaericus* (*B. sphaericus*).
- A. Microbial larvicides
  - B. Mosquito species
  - C. *Bacillus thuringiensis israelensis* (Bti)
  - D. Naturally occurring soil bacterium
  - E. None of the Above
159. *Bacillus thuringiensis israelensis* is a \_\_\_\_\_ registered for control of mosquito larvae.
- A. Microbial larvicides
  - B. Mosquito species
  - C. *Bacillus thuringiensis israelensis* (Bti)
  - D. Naturally occurring soil bacterium
  - E. None of the Above
160. Mosquito larvae eat the \_\_\_\_\_ product that is made up of the dormant spore form of the bacterium and an associated pure toxin.
- A. Microbial larvicides
  - B. Mosquito species
  - C. *Bacillus thuringiensis israelensis* (Bti)
  - D. Naturally occurring soil bacterium
  - E. None of the Above
161. The toxin disrupts the gut in the mosquito by binding to receptor cells present in insects, but not in \_\_\_\_\_.
- A. Mammals
  - B. Mosquito species
  - C. *Bacillus thuringiensis israelensis* (Bti)
  - D. Naturally occurring soil bacterium
  - E. None of the Above
162. There are \_\_\_\_\_ for use in the United States. Aquabac, Teknar, Vectobac, and LarvX are examples of common trade names for the mosquito control products.
- A. EPA as an insecticide in 1983
  - B. 26 Bti products registered
  - C. Registered by the EPA in 1991
  - D. One to four weeks
  - E. None of the Above

163. *Bacillus sphaericus* is a naturally occurring bacterium that is found throughout the world. *B. sphaericus* was initially \_\_\_\_\_ for use against various kinds of mosquito larvae.

- A. EPA as an insecticide in 1983
- B. 26 Bti products registered
- C. Registered by the EPA in 1991
- D. One to four weeks
- E. None of the Above

164. VectoLex CG and WDG are registered *B. sphaericus* products and are effective for approximately \_\_\_\_\_ after application.

- A. EPA as an insecticide in 1983
- B. 26 Bti products registered
- C. Registered by the EPA in 1991
- D. One to four weeks
- E. None of the Above

165. The microbial pesticides have undergone extensive testing prior to registration. They are essentially \_\_\_\_\_, so there are no concerns for human health effects with Bti or *B. sphaericus* when they are used according to label directions.

- A. Nontoxic to humans
- B. Pose risks to wildlife
- C. Do not pose risks
- D. Risks to human health
- E. None of the Above

Do Microbial Larvicides Pose Risks to Wildlife or the Environment?

166. Extensive testing shows that microbial larvicides \_\_\_\_\_, nontarget species, or the environment, when used according to label directions.

- A. Nontoxic to humans
- B. Pose risks to wildlife
- C. Do not pose risks to wildlife
- D. Risks to human health
- E. None of the Above

What is Methoprene?

167. Methoprene is a compound first \_\_\_\_\_ that mimics the action of an insect growth-regulating hormone and prevents the normal maturation of insect larvae.

- A. EPA as an insecticide in 1983
- B. 26 Bti products registered
- C. Registered by the EPA in 1975
- D. One to four weeks
- E. None of the Above

168. It is \_\_\_\_\_ to kill mosquito larvae, and it may be used along with other mosquito control measures in an IPM program.

- A. Solids
- B. Sand granules
- C. Applied to water
- D. Liquid and pelletized formulations
- E. None of the Above

169. Altosid is the name of the methoprene product used in mosquito control and is applied as briquettes (similar in form to charcoal briquettes), pellets, \_\_\_\_\_, and liquids.

- A. Solids
- B. Sand granules
- C. Applied to water
- D. Crystals
- E. None of the Above

170. The \_\_\_\_\_ can be applied by helicopter and fixed-wing aircraft.

- A. Solids
- B. Sand granules
- C. Applied to water
- D. Liquid and pelletized formulations
- E. None of the Above

Does Methoprene Pose Risks to Human Health?

171. Methoprene, used for mosquito control according to its label directions, \_\_\_\_\_ to human health. In addition to posing low toxicity to mammals, there is little opportunity for human exposure, since the material is applied directly to ditches, ponds, marshes, or flooded areas that are not drinking water sources.

- A. Nontoxic to humans
- B. Pose risks to wildlife
- C. Do not pose unreasonable risks
- D. Risks to human health
- E. None of the Above

172. Does Methoprene Pose Risks to Wildlife or the Environment?

Methoprene used in mosquito control programs does \_\_\_\_\_ or the environment.

- A. Nontoxic to humans
- B. Pose risks to wildlife
- C. Not pose unreasonable risks to wildlife
- D. Risks to human health
- E. None of the Above

173. Toxicity of methoprene to birds and fish is low, and it is \_\_\_\_\_.

- A. Nontoxic to humans
- B. Pose risks to wildlife
- C. Do not pose risks
- D. Nontoxic to bees
- E. None of the Above

174. Methoprene breaks down quickly in water and soil and \_\_\_\_\_ into ground water.

- A. Will not leach
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to human health
- E. None of the Above

175. Methoprene mosquito control products present \_\_\_\_\_ risk to freshwater fish, freshwater invertebrates, and estuarine species.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to human health
- E. None of the Above

176. Temephos is an organophosphate (OP) pesticide \_\_\_\_\_ to control mosquito larvae, and it is the only organophosphate with larvicidal use.

- A. EPA as an insecticide in 1983
- B. 26 Bti products registered
- C. Registered by the EPA in 1991
- D. Registered by the EPA in 1965
- E. None of the Above

177. It is an important \_\_\_\_\_ for mosquito control programs; its use helps prevent mosquitoes from developing resistance to the bacterial larvicides.

- A. Insecticide
- B. To kill mosquitoes
- C. Kill adult mosquitoes
- D. Resistance management tool
- E. None of the Above

178. Temephos is used in areas of \_\_\_\_\_, shallow ponds, swamps, marshes, and intertidal zones. It may be used along with other mosquito control measures in an IPM program.

- A. Running waters
- B. Standing water
- C. Stream breeders
- D. Along banks
- E. None of the Above

179. Abate is the trade name of the \_\_\_\_\_ used for mosquito control.

- A. Golden Bear 1111
- B. Oils
- C. Temephos product
- D. Chlordane
- E. None of the Above

180. Temephos is applied most commonly by \_\_\_\_\_, but can be applied by backpack sprayers, fixed-wing aircraft, and right-of-way sprayers in either liquid or granular form.

- A. Aerosol bombs
- B. Hand-carried dispersal units
- C. Helicopter
- D. Aerosol foggers
- E. None of the Above



181. It is \_\_\_\_\_, and the amount of temephos is very small in relation to the area covered, less than 1 ounce of active ingredient per acre for the liquid and 8 ounces per acre for the granular formulations.

- A. Holes and containers
- B. Annoying and potentially dangerous
- C. Unique behaviors and bite
- D. Applied to water
- E. None of the Above

Does Temephos Pose Risks to Human Health?

182. Temephos, applied according to the label for mosquito control, \_\_\_\_\_ to human health.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not unreasonable pose risks
- D. None of the Above

183. Current mosquito larviciding techniques pose \_\_\_\_\_ aquatic species and the aquatic ecosystem.

- A. Nontoxic
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Some risk to nontarget
- E. None of the Above

184. Although temephos presents \_\_\_\_\_ to birds and terrestrial species, available information suggests that it is more toxic to aquatic invertebrates than alternative larvicides.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Relatively low risk
- E. None of the Above

185. For this reason, the EPA is limiting temephos use to areas where \_\_\_\_\_ would not be effective, specifying intervals between applications, and limiting the use of high application rates.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Less-hazardous alternatives
- E. None of the Above

186. Temephos \_\_\_\_\_, and post-application exposure is minimal.

- A. Breaks down within a few days in water
- B. Can be placed even on ice for season-long control
- C. 150 days of uninterrupted mosquito control
- D. Toxin disrupts the lining of the larvae's intestine
- E. None of the Above

187. Does Temephos Pose Risks to Wildlife or the Environment?

Because temephos is applied directly to water, it is not \_\_\_\_\_ on terrestrial animals or birds.

- A. Breaks down within a few days in water
- B. Expected to have a direct impact
- C. 150 days of uninterrupted mosquito control
- D. Toxin disrupts the lining of the larvae's intestine
- E. None of the Above

Monomolecular Films?

188. Monomolecular films are low-toxicity pesticides that spread a thin film on the surface of the water that makes it difficult for mosquito \_\_\_\_\_, pupae, and emerging adults to attach to the water's surface, causing them to drown.

- A. Insecticide
- B. Deet
- C. Kill adult mosquitoes
- D. Larvae
- E. None of the Above

189. Films may remain active typically for \_\_\_\_\_ on standing water, and have been used in the United States in floodwaters, brackish waters, and ponds.

- A. One day
- B. 10-14 days
- C. One year
- D. One to four weeks
- E. None of the Above

190. They may be used along with other mosquito control measures in an IPM program. They are also known under the trade names \_\_\_\_\_ and Agnique MMF.

- A. Golden Bear 1111
- B. Arosurf MSF
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

Do Monomolecular Films Pose Risks to Human Health?

191. Monomolecular films, used according to label directions for larva and pupa control,

\_\_\_\_\_.

- A. Toxic to humans
- B. Minimal acute and chronic
- C. Do not pose risks to human health
- D. Risks to human health
- E. None of the Above

192. In addition to low toxicity, there is \_\_\_\_\_, since the material is applied directly to ditches, ponds, marshes, or flooded areas that are not drinking water sources.

- A. Little opportunity for human exposure
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to human health
- E. None of the Above

Do Films Pose Risks to Wildlife or the Environment?

193. Monomolecular films, used according to label directions for larva and pupa control, \_\_\_\_\_ to the environment.

- A. Nontoxic
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Pose minimal risks
- E. None of the Above

194. They do not last very long in the environment, and are usually applied only to standing water, such as \_\_\_\_\_, woodland pools, or containers that contain few nontarget organisms.

- A. Running waters
- B. On ponds
- C. Stream breeders
- D. Roadside ditches
- E. None of the Above

What are Oils?

195. \_\_\_\_\_, like films, are pesticides used to form a coating on top of water to drown larvae, pupae, and emerging adult mosquitoes.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

196. They are specially derived from petroleum distillates and have been used for many years in the United States to \_\_\_\_\_ on crops and orchard trees, and to control mosquitoes. They may be used along with other mosquito control measures in an IPM program.

- A. Insecticide
- B. To kill mosquitoes
- C. Kill aphids
- D. Larva
- E. None of the Above

197. Trade names for oils used in mosquito control are Bonide, BVA2, and \_\_\_\_\_.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

Do Oils Pose Risks to Human Health?

198. Oils, used according to label directions for larva and pupa control, \_\_\_\_\_ to human health.

- A. Nontoxic
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks
- E. None of the Above

199. In addition to \_\_\_\_\_, there is little opportunity for human exposure, since the material is applied directly to ditches, ponds, marshes, or flooded areas that are not drinking water sources.
- A. Low toxicity
  - B. Minimal acute and chronic
  - C. Do not pose risks
  - D. Risks to human health
  - E. None of the Above

Do Oils Pose Risks to Wildlife or the Environment?

200. Oils, if misapplied, \_\_\_\_\_ and other aquatic organisms. For that reason, the EPA has established specific precautions on the label to reduce such risks.
- A. Nontoxic to humans
  - B. Minimal acute and chronic
  - C. May be toxic to fish
  - D. Risks to human health
  - E. None of the Above

Naled For Mosquito Control

201. Officials responsible for mosquito control programs make decisions to use pesticides based on an evaluation of the \_\_\_\_\_ from diseases transmitted by mosquitoes or on an evaluation of the nuisance level that communities can tolerate from a mosquito infestation.
- A. Risk of low toxicity
  - B. Risk of acute and chronic
  - C. Risks to the general public
  - D. Risks to animals
  - E. None of the Above

202. Based on surveillance and monitoring, mosquito control officials select specific pesticides and other control measures that best suit local conditions in order to achieve effective control of mosquitoes with the \_\_\_\_\_ and the environment.

- A. Nontoxic to humans
- B. Least impact on human health
- C. Do not pose risks
- D. Risks to human health
- E. None of the Above

203. It is especially important to conduct effective mosquito prevention programs by eliminating \_\_\_\_\_ or applying pesticides to control the early life stages of the mosquito.

- A. Insecticide
- B. To kill mosquitoes
- C. Breeding habitats
- D. Larvae
- E. None of the Above

204. Prevention programs, such as elimination of any standing water that could serve as a breeding site, help \_\_\_\_\_ mosquito population and the need to apply other pesticides for adult mosquito control.

- A. Insecticide
- B. To kill mosquitoes
- C. Reduce adult mosquito
- D. Larvae
- E. None of the Above

What is Naled?

205. Naled is an organophosphate (OP) insecticide that has been \_\_\_\_\_ for use in the United States.

- A. EPA as an insecticide in 1983
- B. 26 Bti products registered
- C. Registered by the EPA in 1975
- D. Registered since 1959
- E. None of the Above

206. It is used primarily for controlling adult mosquitoes, but Naled is also used on food and feed crops, and in greenhouses. When applied in accordance with the rate of application and the safety precautions specified on the label, Naled can be used to kill mosquitoes without posing unreasonable \_\_\_\_\_ or the environment.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to human health
- E. None of the Above

How is Naled Used in Mosquito Control?

207. Naled is an adulticide used to \_\_\_\_\_. In mosquito control programs conducted by state or local authorities, Naled is applied by truck-mounted or aircraft-mounted sprayers.

- A. Insecticide
- B. To kill mosquitoes
- C. Kill adult mosquitoes
- D. Larva
- E. None of the Above

208. Naled is applied as an Ultra-low volume (ULV) spray. \_\_\_\_\_ sprayers dispense very fine aerosol droplets that stay aloft and kill mosquitoes on contact. Ultra-low volume (ULV) applications involve small quantities of pesticide active ingredient in relation to the size of the area treated.

- A. Golden Bear 1111
- B. Oils
- C. Ultra-low volume (ULV)
- D. Chlordane
- E. None of the Above

209. For mosquito control, Naled is applied at a maximum rate of \_\_\_\_\_ of active ingredient per acre for aerial application and 0.1 pounds (0.33 ounce) per acre for ground application, which minimizes exposure and risks to people and the environment.

- A. 100 to 500
- B. 3 to 4 broods
- C. In water
- D. 0.05 pounds (0.8 ounce)
- E. None of the Above

Does Naled Pose Risks to Human Health?

210. Naled can be used for public health mosquito control programs without posing unreasonable \_\_\_\_\_ when applied according to the label.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to the general population
- E. None of the Above

211. The EPA has estimated the exposure and \_\_\_\_\_ posed by ULV aerial and ground applications of Naled.

- A. Nontoxic to humans
- B. Risks to both adults and children
- C. Do not pose risks
- D. Minimal acute and chronic
- E. None of the Above

212. Because of the very small amount of active ingredient released per acre of ground, the estimates found that for all scenarios considered, exposures were hundreds or even thousands of times below an amount that \_\_\_\_\_.

- A. Nontoxic to humans
- B. Risks to both adults and children
- C. Might pose a health concern
- D. Minimal acute and chronic
- E. None of the Above

213. These estimates assumed several spraying events over a period of weeks, and also assumed that a toddler would ingest some soil and grass in addition to skin and \_\_\_\_\_.

- A. Nausea
- B. Dizziness
- C. Do not pose risks
- D. Inhalation exposure
- E. None of the Above

214. Naled like other organophosphates, can over stimulate the nervous system causing \_\_\_\_\_, dizziness, or confusion.

- A. Nausea
- B. Convulsions
- C. Do not pose risks
- D. Minimal acute and chronic
- E. None of the Above

215. Severe high-dose poisoning with any organophosphate can cause convulsions, respiratory paralysis, and \_\_\_\_\_.

- A. Nausea
- B. Dizziness
- C. Do not pose risks
- D. Death
- E. None of the Above

216. Does Naled Pose Risks to Wildlife or the Environment?

Naled used in mosquito control programs does not pose unreasonable \_\_\_\_\_ or the environment.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Risks to wildlife
- D. Risks to human health
- E. None of the Above

217. Naled degrades rapidly in the environment, and it displays \_\_\_\_\_ to birds and mammals.

- A. Nontoxic
- B. Low toxicity
- C. Do not pose risks
- D. Extreme risks
- E. None of the Above

218. \_\_\_\_\_ risk to fish is not expected, but there is potential for risks to invertebrates from the repeated use of Naled.

- A. Toxic
- B. Acute and chronic
- C. Do not pose risks
- D. High risks
- E. None of the Above

219. Naled is \_\_\_\_\_ to insects, including beneficial insects such as honeybees. For that reason, the EPA has established specific precautions on the label to reduce such risk.

- A. Nontoxic
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Highly toxic
- E. None of the Above

What are Synthetic Pyrethroids?

220. Pyrethroids are synthetic chemical insecticides that act in a similar manner to \_\_\_\_\_, which are derived from chrysanthemum flowers.

- A. Golden Bear 1111
- B. Pyrethrins
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above

221. Pyrethroids are widely used for controlling various insects. Permethrin, \_\_\_\_\_, and sumithrin are synthetic pyrethroids commonly used in mosquito control programs to kill adult mosquitoes.

- A. Golden Bear 1111
- B. Oils
- C. Chlorinated hydrocarbons
- D. Resmethrin
- E. None of the Above

222. Permethrin has been \_\_\_\_\_. It is currently registered and sold in a number of products such as household insect foggers and sprays, tick and flea sprays for yards, flea dips and sprays for cats and dogs, termite treatments, agricultural and livestock products, and mosquito abatement products.

- A. EPA as an insecticide in 1983
- B. Registered by the EPA since 1977
- C. Registered by the EPA in 1975
- D. Registered by the EPA since 1998
- E. None of the Above

223. Resmethrin has been \_\_\_\_\_ and is used to control flying and crawling insects in the home, lawn, garden, and industrial sites. It can also be used to control insects on ornamental plants (outdoor and greenhouse use), on pets and horses, and as a mosquitocide.

- A. EPA as an insecticide in 1983
- B. Registered by the EPA since 1977
- C. Registered by the EPA in 1975
- D. Registered by the EPA since 1971
- E. None of the Above

224. Sumithrin has been \_\_\_\_\_ and is used to control adult mosquitoes and as an insecticide in transport vehicles such as aircraft, ships, railroad cars, and truck trailers.

- A. EPA as an insecticide in 1983
- B. Registered by the EPA since 1977
- C. Registered by the EPA in 1975
- D. Registered by the EPA since 1971
- E. None of the Above

#### Synthetic Pyrethroids Used in Adult Mosquito Control

225. Most \_\_\_\_\_ control products can be applied only by public health officials and trained personnel of mosquito control districts.

- A. Aerosol bombs
- B. Hand-carried dispersal units
- C. ULV spraying
- D. Aerosol foggers
- E. None of the Above

226. Mosquito control professionals apply pyrethroids as an \_\_\_\_\_ spray. Ultra-low volume (ULV) sprayers dispense very fine aerosol droplets that stay aloft and kill adult mosquitoes on contact.

- A. Golden Bear 1111
- B. Oils
- C. Ultra-low volume (ULV)
- D. Chlordane
- E. None of the Above

227. Pyrethroids used in mosquito control are typically mixed with a synergist compound, such as \_\_\_\_\_, which enhances the effectiveness of the active ingredient.

- A. Golden Bear 1111
- B. Piperonyl butoxide
- C. Chlorinated hydrocarbons
- D. Chlordane
- E. None of the Above



228. The product is often diluted in water or oil and applied at rates \_\_\_\_\_ of a pound of active ingredient or less than 4 fluid ounces of mixed formulation per acre.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. In water
- D. Less than 1/100th
- E. None of the Above

Do Pyrethroids Pose Risks to Human Health?

229. Pyrethroids can be used for public health mosquito control programs without posing unreasonable \_\_\_\_\_ when applied according to the label.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to human health
- E. None of the Above

230. Pyrethroids are considered to pose \_\_\_\_\_ to humans, but at high doses, pyrethroids can affect the nervous system.

- A. Nontoxic
- B. Minimal acute and chronic
- C. Slight risks of acute toxicity
- D. Risks
- E. None of the Above

Do Pyrethroids Pose Risks to Wildlife or the Environment?

231. Pyrethroids used in mosquito control programs \_\_\_\_\_ risks to wildlife or the environment.

- A. Nontoxic to humans
- B. Minimal acute and chronic
- C. Do not pose unreasonable
- D. Risks to human health
- E. None of the Above

232. Pyrethroids, when applied at mosquito control rates, are low in toxicity to mammals, and are practically \_\_\_\_\_ to birds.

- A. Nontoxic
- B. Minimal acute and chronic
- C. Do not pose risks
- D. Risks to
- E. None of the Above

233. Mosquito control formulations of permethrin break down in the environment, and \_\_\_\_\_ and sunlight accelerate this process.

- A. Running waters
- B. High temperatures
- C. Stream breeders
- D. Cold weather
- E. None of the Above

234. Pyrethroids are \_\_\_\_\_ to fish and to bees. For this reason, the EPA has established specific precautions on the label to reduce such risks, including restrictions that prohibit the direct application of products to open water or within 100 feet of lakes, streams, rivers, or bays.
- A. Nontoxic
  - B. Minimal acute and chronic
  - C. Do not pose risks
  - D. Toxic
  - E. None of the Above

Anopheles spp.

Of the insects that serve as vectors for parasitic diseases, this genus is arguably the most important.

235. Of the approximately \_\_\_\_\_ of Anopheles, about two dozen serve as vectors for malaria (Plasmodium spp.) in humans.
- A. 100 to 500 larvae
  - B. 3 to 4 broods
  - C. 422 species
  - D. 300
  - E. None of the Above

236. There are about 422 species of Anopheles worldwide, many of them sibling species that can only be identified using genetic techniques. Of these, about \_\_\_\_\_ of the protozoan Plasmodium that causes malaria, but only about 40 are important.

- A. 100 to 500 larvae
- B. 70 are vectors
- C. All are virus
- D. 1 of 2
- E. None of the Above

237. Malaria infects \_\_\_\_\_ people and kills 1.5-2.7 million people each year, making it by far the most serious of the diseases spread by insects.

- A. 100 to 500
- B. 300-500 million
- C. 1 of two
- D. 5 billion
- E. None of the Above

238. Culex pipiens, the \_\_\_\_\_ has a distribution that roughly includes the northern half of the United States.

- A. Culex quinquefasciatus
- B. Culex pipiens
- C. Culex restuans
- D. Hibernating females
- E. None of the Above

239. The species is replaced by \_\_\_\_\_, the Southern House Mosquito, in the southern United States with limited overlap in portions of the Midwest.

- A. Culex quinquefasciatus
- B. Culex pipiens
- C. Culex restuans
- D. Hibernating females
- E. None of the Above

240. \_\_\_\_\_ provides the life cycle model for most of the domestic Culex in temperate areas.
- A. Culex quinquefasciatus
  - B. Culex pipiens
  - C. Culex restuans
  - D. Hibernating females
  - E. None of the Above
241. The \_\_\_\_\_ pass the winter in diapause and do not become active during periods of warm winter weather.
- A. Culex quinquefasciatus
  - B. Culex pipiens
  - C. Culex restuans
  - D. Females
  - E. None of the Above
242. \_\_\_\_\_ are common in basements, outbuildings, and subterranean enclosures.
- A. Culex quinquefasciatus
  - B. Culex pipiens
  - C. Culex restuans
  - D. Hibernating females
  - E. None of the Above
243. Like \_\_\_\_\_, the females congregate near moisture and move their resting location during the winter to remain in a humid atmosphere.
- A. Culex quinquefasciatus
  - B. Culex pipiens
  - C. Culex restuans
  - D. Hibernating females
  - E. None of the Above
244. Mortality can be extensive during periods of \_\_\_\_\_.
- A. Culex quinquefasciatus
  - B. Culex pipiens
  - C. Culex restuans
  - D. Winter drought
  - E. None of the Above
245. \_\_\_\_\_ emerge from hibernation during May and begin depositing egg rafts in suitable habitat.
- A. Culex quinquefasciatus
  - B. Culex pipiens
  - C. Culex restuans
  - D. Females
  - E. None of the Above
246. Populations of this mosquito usually peak during August, but \_\_\_\_\_ well into September.
- A. Culex quinquefasciatus
  - B. Culex pipiens
  - C. Culex restuans
  - D. Hibernating females
  - E. None of the Above

247. The adults from the \_\_\_\_\_ of the season lose all interest in blood meal hosts but will move in and out of overwintering sites during periods of mild fall weather.

- A. Last generation
- B. Breeding habitats
- C. Temporary ground water
- D. Deposits its eggs
- E. None of the Above

248. Larvae rarely persist in \_\_\_\_\_ after females have entered hibernation.

- A. Last generation
- B. Breeding habitats
- C. Temporary ground water
- D. Deposits its eggs
- E. None of the Above

249. *Culex pipiens* can be found in a fairly wide range of larval habitats, but are generally associated with water that has a high organic content.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

250. The species utilizes \_\_\_\_\_ that ranges from mildly to grossly polluted.

- A. Last generation
- B. Breeding habitats
- C. Temporary ground water
- D. Deposits its eggs
- E. None of the Above

251. The species also \_\_\_\_\_ in artificial containers, including tin cans, tires, and any refuse that allows stagnant water to puddle.

- A. Last generation
- B. Breeding habitats
- C. Temporary ground water
- D. Deposits its eggs
- E. None of the Above

252. The species is decidedly urban and reaches greatest numbers in large urban centers. Catch basins and storm drains provide ideal habitat for *Cx. pipiens*.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

253. \_\_\_\_\_ and slaughter house drainage ponds support high populations of this species.

- A. Meat packing plants
- B. Eastern seaboard
- C. Gulf Coast region
- D. Sumps on farms
- E. None of the Above

254. \_\_\_\_\_ can always be collected in the effluent from sewage treatment plants.
- A. *Culex quinquefasciatus*
  - B. *Culex pipiens*
  - C. *Culex restuans*
  - D. Hibernating females
  - E. None of the Above

Collection

255. No special techniques are required to collect \_\_\_\_\_ larvae. This species is common in urban settings and can usually be found in significant numbers in a variety of habitats where stagnant water collects.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

256. \_\_\_\_\_ will oviposit readily in buckets containing prepared straw infusions. Most piles of discarded tires contain a mixture of *Cx. pipiens* and *Cx. restuans* in addition to the tire-breeding *Aedes*.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

257. \_\_\_\_\_ occurs on every continent except Antarctica and is the most widely distributed mosquito in the world.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

258. In North America, two races range north (*Cx. pipiens pipiens*) and south (*Cx. pipiens quinquefasciatus*) of 39°N latitude, about the level of Sacramento. *Cx. p. pipiens* lives in the milder coastal climate areas, while *Cx. p. quinquefasciatus* is found in the \_\_\_\_\_.

- A. Meat packing plants
- B. Eastern seaboard
- C. Warmer inland valleys
- D. Sumps on farms
- E. None of the Above

259. \_\_\_\_\_ main host is wild birds, but it also feeds freely on a wide variety of warm-blooded vertebrates, including man.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

260. In northern California, it currently plays only a lesser role as a carrier of human disease, while in southern California and the \_\_\_\_\_, it is a major carrier of Saint Louis encephalitis.

- A. Meat packing plants
- B. Eastern seaboard
- C. Gulf Coast region
- D. Sumps on farms
- E. None of the Above

261. It is also the best known carrier of West Nile Virus, a severe encephalitis virus newly arrived in the Americas that is spreading along the \_\_\_\_\_.

- A. Meat packing plants
- B. Eastern seaboard
- C. Gulf Coast region
- D. Sumps on farms
- E. None of the Above

262. \_\_\_\_\_ is a serious pest, called the "house mosquito" because it commonly develops in small containers around the home.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

263. It shows great skill in finding ways to get into the house, where it feeds on the occupants at night. It also occurs in containers and \_\_\_\_\_ and industrial plants, in polluted waters, and will feed out-of-doors at night.

- A. Meat packing plants
- B. Eastern seaboard
- C. Gulf Coast region
- D. Sumps on farms
- E. None of the Above

264. \_\_\_\_\_ larvae typically develop best in dirty, stagnant water containing abundant organic matter, in ground pools and natural and man-made containers.

- A. *Culex quinquefasciatus*
- B. *Culex pipiens*
- C. *Culex restuans*
- D. Hibernating females
- E. None of the Above

265. Vector technicians often find improperly installed or maintained \_\_\_\_\_ producing huge numbers of this species.

- A. Meat packing plants
- B. Eastern seaboard
- C. Gulf Coast region
- D. Underground septic tanks
- E. None of the Above

266. The mosquitoes gain entrance through \_\_\_\_\_, through poorly fitting or unsealed covers, or by the vent pipes made for removal of gases.

- A. Meat packing plants
- B. Eastern seaboard
- C. Cracks in the ground
- D. Sumps on farms
- E. None of the Above

267. Most larval samples from \_\_\_\_\_ consist mainly of Cx. pipiens and Cx restuans.

- A. Meat packing plants
- B. Eastern seaboard
- C. Polluted water sources
- D. Sumps on farms
- E. None of the Above

Where does this Mosquito normally lay its Eggs?

268. In tin cans, buckets, discarded tires and other artificial containers that \_\_\_\_\_.

- A. Discerned with practice
- B. Hold stagnant water
- C. Build body fat
- D. State of torpor
- E. None of the Above

269. In unintended bird baths, clogged rain gutters and plastic wading pools that \_\_\_\_\_.

- A. Discerned with practice
- B. Hold stagnant water
- C. Build body fat
- D. State of torpor
- E. None of the Above

270. In \_\_\_\_\_ and catch basins in urban areas.

- A. Discerned with practice
- B. Hold stagnant water
- C. Catch basins
- D. State of torpor
- E. None of the Above

271. In septic seepage and other foul water sources above or \_\_\_\_\_.

- A. Below ground level
- B. Hold stagnant water
- C. Build body fat
- D. State of torpor
- E. None of the Above

How does this Mosquito Overwinter?

272. The last generation of adult females mate and \_\_\_\_\_ by feeding on carbohydrates.

- A. Discerned with practice
- B. Hold stagnant water
- C. Build body fat
- D. State of torpor
- E. None of the Above

273. Mated females \_\_\_\_\_ in culverts, basements, and protected areas that stay above freezing.

- A. Discerned with practice
- B. Hold stagnant water
- C. Build body fat
- D. Find refuge
- E. None of the Above

274. The body metabolism slows considerably and winter is spent in a \_\_\_\_\_.

- A. Discerned with practice
- B. Hold stagnant water
- C. Build body fat
- D. State of torpor
- E. None of the Above

275. Females that survive the winter blood feed in spring and lay eggs that \_\_\_\_\_ populations.

- A. Discerned with practice
- B. Produce the summer
- C. Build body fat
- D. State of torpor
- E. None of the Above

#### Antennal Shape

276. The characteristic antennal shape is difficult to see in the dipper, but the slightly longer, constricted antennae and \_\_\_\_\_ can be discerned with practice.

- A. Discerned with practice
- B. Hold stagnant water
- C. Build body fat
- D. Prominent antennal tufts
- E. None of the Above

277. The \_\_\_\_\_ on the siphon can be used as a diagnostic character under the microscope.

- A. Discerned with practice
- B. Multiple hair tufts
- C. Build body fat
- D. State of torpor
- E. None of the Above

278. *Culex salinarius* is a closely related species that is easily distinguished by the longer, \_\_\_\_\_.

- A. Discerned with practice
- B. More slender siphon
- C. Build body fat
- D. State of torpor
- E. None of the Above

279. SLE is a natural \_\_\_\_\_ found in a variety of wild birds.

- A. Infection
- B. SLE
- C. Indicator of polluted water
- D. Primary vector
- E. None of the Above



280. *Culex pipiens* can function as a \_\_\_\_\_ and pass the virus from one bird to the next.

- A. Infection
- B. SLE
- C. Indicator of polluted water
- D. Vector
- E. None of the Above

281. If virus is introduced to an urban setting, *Culex pipiens* can amplify the \_\_\_\_\_ in urban birds.

- A. Infection
- B. SLE
- C. Indicator of polluted water
- D. Primary vector
- E. None of the Above

282. House Sparrows, an introduced species, circulate exceptionally high levels of \_\_\_\_\_ when they become infected.

- A. Infection
- B. SLE
- C. Indicator of polluted water
- D. Primary vector
- E. None of the Above

283. *Culex pipiens* that bite infected birds acquire the \_\_\_\_\_ and are capable of passing it on to humans.

- A. Infection
- B. SLE
- C. Virus
- D. Primary vector
- E. None of the Above

#### Summary

284. \_\_\_\_\_ is usually the most common pest mosquito in urban and suburban settings.

- A. Infection
- B. SLE
- C. *Culex pipiens*
- D. Primary vector
- E. None of the Above

285. \_\_\_\_\_ is an indicator of polluted water in the immediate vicinity.

- A. Infection
- B. SLE
- C. *Culex pipiens*
- D. Primary vector
- E. None of the Above

286. *Culex pipiens* is recognized as the primary vector of \_\_\_\_\_.

- A. Infection
- B. SLE
- C. *Culex pipiens*
- D. Primary vector
- E. None of the Above

287. \_\_\_\_\_ is normally considered to be a bird feeder.

- A. Infection
- B. SLE
- C. *Culex pipiens*
- D. Primary vector
- E. None of the Above

288. Some \_\_\_\_\_ have a predilection for mammalian hosts and feed readily on humans.

- A. Infection
- B. SLE
- C. Urban strains
- D. Primary vector
- E. None of the Above

289. Most populations probably contain individuals that \_\_\_\_\_ from mammals as well as birds.

- A. Infection
- B. SLE
- C. Accept blood
- D. Primary vector
- E. None of the Above

Pale Marsh Mosquito *Ochlerotatus dorsalis*

290. *Ochlerotatus dorsalis*' common name comes from its whitish-grey appearance: the abdomen and wings have intermixed narrow light and dark scales. Sometimes the \_\_\_\_\_.

- A. Light scales predominate
- B. Seasonally flooded
- C. Last adults emerging
- D. Brackish marshes
- E. None of the Above

291. In California, it occurs along the Pacific coast and in the eastern regions of the state. It breeds along the edges of bays, \_\_\_\_\_. It is especially frequent in the seasonally flooded marshes along the edges of the San Francisco and San Pablo Bays.

- A. Light scales predominate
- B. Seasonally flooded
- C. Last adults emerging
- D. Marshes and lakes
- E. None of the Above

292. A strong flyer, *Ochlerotatus dorsalis* often disperses \_\_\_\_\_ or more from its breeding sources. Unlike most other local *Ochlerotatus*, the pale marsh mosquito is active almost year-around.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. In water
- D. 20 miles
- E. None of the Above

293. Females produce continuous broods throughout the spring and summer, with 8 to 12 hatches each year, and the \_\_\_\_\_ in October.

- A. Light scales predominate
- B. Seasonally flooded
- C. Last adults emerging
- D. Brackish marshes
- E. None of the Above

294. Pre-adult stages can be as short as \_\_\_\_\_ in the warm summer weather.

- A. 100 to 500 larvae
- B. 3 to 4 broods
- C. In water
- D. 1 to 2 weeks
- E. None of the Above

295. Populations sometimes build up to huge numbers in \_\_\_\_\_ subject to prolonged spring flooding.

- A. Light scales predominate
- B. Seasonally flooded
- C. Last adults emerging
- D. Brackish marshes
- E. None of the Above

296. *Ochlerotatus dorsalis* is a serious pest mosquito and a \_\_\_\_\_ of the encephalitis virus. Females prefer to feed on large mammals like cattle and horses (and man) when these are available.

- A. Light scales predominate
- B. Seasonally flooded
- C. Secondary vector
- D. Brackish marshes
- E. None of the Above

297. They are \_\_\_\_\_, and so aggressive and persistent that livestock tend to move away from areas where they are numerous.

- A. Highest malaria infection rates
- B. Malaria vector
- C. Vicious biters
- D. Bite man aggressively
- E. None of the Above

Western Malaria Mosquito *Anopheles freeborni*

298. *Anopheles freeborni* is the most important \_\_\_\_\_ in California. In our lifetime, endemic malaria has been eradicated from the U.S. But in our grandparents' time, it was so serious that education guidelines called for it to be included in the instructional program in every primary school.

- A. Highest malaria infection rates
- B. Malaria vector
- C. Active infections
- D. Bite man aggressively
- E. None of the Above

299. Today, carrier mosquitoes still occur throughout the state, and hundreds of \_\_\_\_\_ are discovered every year in tourists and immigrants from other countries.

- A. Highest malaria infection rates
- B. Malaria vector
- C. Active infections
- D. Bite man aggressively
- E. None of the Above

300. Anopheles are \_\_\_\_\_ from other mosquitoes: their eggs are laid individually and have small floats on each side; the larvae lack the long breathing tube found in other mosquitoes; adults have hairs, but no scales on the abdomen and both sexes have palpi as long as the proboscis.

- A. Highest malaria infection rates
- B. Malaria vector
- C. Active infections
- D. Easily distinguished
- E. None of the Above

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