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 ______________________________________________________________

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Phone: Home (____) _____________________ Work (____) _____________________

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License or
App. 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 _____________

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

If you’ve paid on the Internet, please write your Customer#______________
4 or 5 digit code

We will stop mailing the certificate of completion so we need either your fax number or e-mail address. We will e-mail the certificate to you, if no e-mail address; we will fax it to you.
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You can obtain a printed version of the course manual from TLC for an additional $129.95 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.

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Mosquito Control Training Course

NAME: ____________________________________________________________

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

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4. How did you hear about this Course? ________________________________

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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.

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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.

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Mosquito Control Answer Key

Name ________________________________

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You are responsible to ensure that this course is accepted for credit by your State. No refunds. 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? ___________________

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 or 6

Topic 1 – Mosquito Introduction Section

5. A B C D 10. A B C D 15. A B C D

Topic 2 – Mosquito Identification Section

5. A B C D 10. A B C D 15. A B C D
Topic 3– Mosquito-Borne Diseases Section

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D
6. A B C D
7. A B C D
8. A B C D
9. A B C D
10. A B C D
11. A B C D
12. A B C D
13. A B C D
14. A B C D
15. A B C D

Topic 4– Mosquito Control Section

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D
6. A B C D
7. A B C D
8. A B C D
9. A B C D
10. A B C D
11. A B C D
12. A B C D
13. A B C D
14. A B C D
15. A B C D

Topic 5– Insects Commonly Mistaken for Mosquitoes

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D
6. A B C D
7. A B C D
8. A B C D
9. A B C D
10. A B C D
11. A B C D
12. A B C D
13. A B C D
14. A B C D
15. A B C D

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

I understand that I am 100 percent responsible to ensure that TLC receives the Assignment and Registration Key. I understand that TLC has a zero tolerance towards not following their rules, cheating or hostility towards staff or instructors. I need to complete the entire assignment for credit. My exam was proctored. There is no credit for partial assignment completion. I will contact TLC if I do not hear back from them within 2 days of assignment submission. I will forfeit my purchase costs and will not receive credit or a refund if I do not abide with TLC’s rules.

Please Sign that you understand and will abide with TLC’s Rules.

____________________________________________________
Signature

Mosquito Control 1/13/2020
Write down any questions that you had problems.

Please fax or email this and the registration Page to TLC.

Call 15 minutes later to ensure we have received the paperwork.

**INSTRUCTIONS**
We will require all students to fax or e-mail a copy of their driver's license with the registration form.

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 9-16.

Assignment #2 for all pest applicators whose last names start with F-K you will find your assignment on pages 17-26.

Assignment #3 for all pest applicators whose last name starts with the letter L-P, your assignment is found on pages 27-35.

Assignment #4 for all pest applicators whose last name starts with the letter Q-R, your assignment is found on pages 37-45.

Assignment #5 for all pest applicators whose last name starts with the letter S-Z, your assignment is found on pages 47-55.

Assignment #6 for repeat students, your assignment is found on pages 57-65.
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.

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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.

Assignment #6 for repeat students.

Topic 1 – Mosquito Introduction Section

Integrated Pest Management -Introduction
1. IPM is a science-based and common-sense approach for ____________, vectors, such as mosquitoes.
   A. Managing pests   C. Pest monitoring
   B. Surveillance      D. None of the above

2. IPM relies heavily on resident education and ________________.
   A. Pests and vectors  C. Pest monitoring
   B. Pest prevention    D. None of the above

3. ______________ is a important component to any successful IPM program because the results from the surveillance will help determine the appropriate response to an infestation.
   A. Surveillance      C. Lower levels of infestations
   B. Pest prevention    D. None of the above

4. Once mosquitoes have landed, they rely on ______________ to determine if we are an acceptable blood meal host.
   A. Transient waters  C. A number of short-range attractants
   B. Torpor           D. None of the above

5. Mosquitoes that hibernate in the adult stage live for 6-8 months, but spend most of that time in a ________________.
   A. Its life cycle     C. State of torpor
   B. Cocoon            D. None of the above
6. Aedes adults will oviposit near the edge of the swamp or within tufts of vegetation, requiring later flooding to ___________________.
   A. Begin its life cycle       C. Inundate the eggs for hatching
   B. Look for a blood meal     D. None of the above

**Mosquito Life Cycle Section**

7. The type of standing water in which the mosquito chooses to lay her ___________ depends upon the species.
   A. Nest   C. Eggs
   B. Raft   D. None of the above

8. Sections of marshes, swamps, clogged ditches, and temporary pools and puddles are all prolific mosquito breeding sites. Other locations in which some species lay their ___________ include tree holes and containers such as old tires, buckets, toys, potted plant trays, and saucers and plastic covers or tarpaulins.
   A. Nest   C. Eggs
   B. Raft   D. None of the above

9. The mosquito goes through three distinct stages during its life cycle.
   A. True   B. False

**Wrigglers and Tumblers**

10. After the female mosquito obtains a blood meal, she lays her eggs directly on the surface of stagnant water, in a depression, or on the edge of a container where rainwater may collect and flood the eggs.
    A. True   B. False

11. The larva lives in the water, feeds, and develops into the third stage of the life cycle called a pupa or "______________".
    A. Ergatoids       C. Wrigglers
    B. Tumbler         D. None of the above

12. Mosquitoes may overwinter as eggs or,_______________.
    A. Fertilized adult females or larvae       C. Wriggler
    B. Ergatoids                               D. None of the above

13. Mosquitoes belonging to the genus Culex lay their ________________ in bunches or "rafts."
    A. Tumblers       C. Eggs
    B. Cocoons       D. None of the above

**Weather**

14. Mosquito development and population dynamics are closely tied to weather. When and how much rain is received, wind speed and direction, maximum and minimum temperatures, and the total amount of heat energy accumulated are all critical to mosquito development.
    A. True   B. False
**Water Source**

15. The water (or lack thereof) in a habitat directly does not affect mosquito reproduction. Very few mosquitoes need standing water to complete their development.
A. True B. False

**Topic 2 – Mosquito Identification Section**

1. Culiseta melanura is critical because of its role in the transmission cycle of eastern equine encephalitis virus and potentially _____________________.
   A. SLE C. WNV (West Nile virus)
   B. Malaria D. None of the above

2. Culiseta melanura is a medium-sized mosquito that resembles Culex species because of its _____________________.
   A. Bluntly rounded abdominal tip C. Brownish color with pale bands
   B. Distinct ring around the proboscis D. None of the above

3. Culex pipiens the Northern House Mosquito has a distribution that roughly includes the ________________ of the United States.
   A. Out-of-doors at night C. Northern half
   B. Southern parts D. None of the above

4. Although they occur in__________________, Culex pipiens reach their greatest numbers in urban and suburban areas and readily enter homes.
   A. Out-of-doors at night C. Rural environments
   B. Temporary ground water D. None of the above

5. Catch basins and storm drains provide ideal habitat for Cx. pipiens. The species becomes particularly abundant in areas where raw sewage leaks into___________________.
   A. Treeholes C. Effluent from sewage treatment plants
   B. Subterranean drainage systems D. None of the above

6. Malaria was a serious plague in the United States for centuries until its final eradication in the 1950s. Despite the ostensible eradication, there are occasional cases of autochthonous (local) transmission in the U.S. vectored by An. quadrimaculatus in the east and Anopheles freeborni in the west.
A. True B. False

7. Culex pipiens can be found in a fairly limited range of larval habitats, but are generally associated with water that has a low organic content.
A. True B. False

8. Culex pipiens' main host is wild donkeys, but it also feeds freely on a wide variety of warm-blooded vertebrates, including birds.
A. True B. False

9. Culex pipiens is a serious pest, called the "house mosquito" because it commonly develops in small containers around the home. It shows great skill in finding ways to get into the house, where it feeds on___________________.
   A. Birds C. Effluent from sewage treatment plants
   B. The occupants at night D. None of the above
10. Culex tarsalis breeds in nearly every freshwater source except _________________. Larvae are found in all but the most polluted ground pools.
   A. Treeholes  
   B. Ground water  
   C. Effluent from sewage treatment plants  
   D. None of the above

11. Culex tarsalis is the most important carrier of ________________ in much of the western U.S.
   A. WEE  
   B. Malaria  
   C. Western equine and Saint Louis encephalitis  
   D. None of the above

12. As mosquitoes go, the Western Encephalitis Mosquito is one of the more easily recognizable, with its _________________.
   A. Distinctive scale patterns  
   B. Distinct ring around the proboscis  
   C. High pitched scream  
   D. None of the above

13. Species in the genus Culex are known as “snowpool” mosquitoes.
   A. True  
   B. False

14. Woodland Malaria mosquitoes have four life stages: egg, larva, pupa, and adult. The immature stages need standing water to complete their life cycle.
   A. True  
   B. False

**Effective Mosquito-Control Program**
15. Initial surveys identify the species of mosquitoes present and provide general information on locations, densities and disease potential. With this knowledge it may be possible to determine life cycles and feeding preferences; predict larval habitats, adult resting places and flight ranges; and perhaps even make preliminary recommendations for control programs.
   A. True  
   B. False

**Topic 3– Mosquito-Borne Diseases Section**
1. Zika disease is spread mostly by the bite of an infected Aedes species mosquito (Ae. aegypti and Ae. albopictus). These mosquitoes bite_______________.
   A. Birds as blood meal hosts  
   B. Infected dogs  
   C. During the day and night  
   D. None of the above

2. Encephalitis is _____________, and serious disease carried by mosquitoes. Its symptoms are severe headache, fever, vomiting, disorientation, chills, muscle aches and pains. It usually occurs in warm wet weather.
   A. A birth defect  
   B. Fever and joint pain  
   C. An untreatable, sometimes deadly  
   D. None of the above

3. ________________ is a dangerous parasitic disease common in tropical and subtropical areas. It is transmitted by the female Anopheles mosquito.
   A. EEE virus  
   B. Dog heartworm  
   C. Malaria  
   D. None of the above
4. ____________________ is spread to people by the bite of an infected mosquito. The most common symptoms of infection are fever and joint pain.
A. EEE virus C. Chikungunya virus
B. Dog heartworm D. None of the above

5. If a fully engorged mosquito with _______________ positive blood is squashed on the skin, there would be insufficient transfer of virus to produce infection.
A. EEE virus C. HIV
B. Dog heartworm D. None of the above

Canine Heartworm
6. Adult heartworms live in a dog’s liver, but young forms of the worm are found in their excrement. Mosquitoes transmit the infection when they feed on the blood of an infected dog.
A. True B. False

7. The dog heartworm parasite does not develop properly in humans and is not regarded as a human health problem. A closely related parasite, however, produces human elephantiasis in some tropical areas of the world, a debilitating mosquito-borne affliction that results in grossly swollen arms, legs, and genitals.
A. True B. False

8. ____________________ is a Bunyavirus and is a zoonotic pathogen cycled between the daytime-biting treehole mosquito, Aedes triseriatus, and vertebrate amplifier hosts (chipmunks, tree squirrels) in deciduous forest habitats.
A. LAC virus C. Brokebone fever
B. Dog heartworm D. None of the above

9. _________________ is maintained over the winter by transovarial transmission in mosquito eggs. If the female mosquito is infected, she may lay eggs that carry the virus, and the adults coming from those eggs may be able to transmit the virus to chipmunks and to humans.
A. LAC virus C. Brokebone fever
B. EEE virus D. None of the above

10. _________________ is also caused by a virus transmitted to humans and equines by the bite of an infected mosquito.
A. Eastern equine encephalitis (EEE) C. Beaver fever
B. Dog heartworm D. None of the above

11. ____________________ is an alphavirus that was first identified in the 1930's and currently occurs in focal locations along the eastern seaboard, the Gulf Coast and some inland Midwestern locations of the United States.
A. LAC virus C. Brokebone fever
B. EEE virus D. None of the above

12. _________________ occurs in natural cycles involving birds and Culiseta melanura, in some swampy areas nearly every year during the warm months.
A. EEE virus C. Beaver fever
B. Dog heartworm D. None of the above
13. Where ______________________ resides or how it survives in the winter is unknown. It may be introduced by migratory birds in the spring or it may remain dormant in some yet undiscovered part of its life cycle.
A. LAC virus       C. Brokebone fever
B. EEE virus       D. None of the above

14. In this usual cycle of transmission, virus does not escape from these areas because the mosquito involved prefers to feed upon birds and does not usually bite humans or other mammals.
A. True   B. False

15. Other mosquito species such as Ae. vexans and Culex nigripalpus can also transmit _________________. When health officials maintain surveillance for EEE virus activity, this movement out of the swamp can be detected, and if the level of activity is sufficiently high, can recommend and undertake measures to reduce the risk to humans.
A. LAC virus       C. Brokebone fever
B. EEE virus       D. None of the above

**Topic 4– Mosquito Control Section**

1. ________________ include the bacterial insecticides Bacillus thuringiensis israelensis and Bacillus sphaericus, the insect growth inhibitor methoprene, and the organophosphate insecticide temephos.
A. Oils         C. Tablet formulations
B. Larvicides   D. None of the above

2. ________________ are applied directly to water using backpack sprayers and truck or aircraft-mounted sprayers.
A. Oxygen formulations        C. Insect growth inhibitor methoprene
B. Liquid larvicide products   D. None of the above

3. ________________ of larvicides are also applied by mosquito controllers to breeding areas.
A. Naled             C. Tablet, pellet, granular, and briquette formulations
B. Sulfur dioxide    D. None of the above

4. Oils 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 ________________.
A. Oxygen              C. Insect growth inhibitor naled
B. Liquid larvicide products   D. None of the above

5. ________________ is another safe material for control of mosquito larvae. It is an insect hormone that retards the development of larvae and prevents mosquitoes from developing into adults.
A. Methoprene (Altosid XR)       C. Insect spray
B. Liquid products             D. None of the above
**Microbial Insecticides**

6. When the bacteria Bti encysts, it produces a protein crystal toxic to mosquito and midge larvae. Once the bacteria have been ingested, the toxin disrupts the lining of the larvae's intestine. It has no effect on a vast array of other aquatic organisms except midges in the same habitat.

A. True  
B. False  

7. ________________ mimics a natural juvenile hormone, and when present in the larval habitat, it keeps immature insects from maturing into adults. Unable to metamorphose, the mosquitoes die in the pupal stage.

A. Methoprene  
B. Liquid larvicide products  
C. Organophosphate insecticide  
D. None of the above

8. The ________________ kills the mosquitoes without upsetting the septic system's bacterial digestive processes.

A. Altosid  
B. Methoprene  
C. Organophosphate insecticide  
D. None of the above

9. Mosquito adulticides are applied as ultra-high volume (UHV) sprays. UHV sprayers dispense very coarse aerosol droplets that stay aloft and kill flying mosquitoes on contact.

A. True  
B. False  

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

A. True  
B. False  

11. Space sprays or aerosol "bombs," containing ____________, are effective against adult mosquitoes. Frequent treatments may be needed during problem periods.

A. Synergized pyrethrins 0.1%  
B. Malathion  
C. Organophosphate insecticide  
D. None of the above

12. ________________, typically applied as high volume (low concentration) liquids with hand-held spray equipment using compounds with residual characteristics, are common in some U.S. locations and their use is growing.

A. An adulticide  
B. Naled  
C. Barrier treatments  
D. None of the above

13. ________________ is an insecticide of relatively low human toxicity; however recent studies have shown that children with higher levels of malathion in their urine seem to be at an increased risk of attention deficit hyperactivity disorder.

A. ULV applications  
B. Malathion  
C. An organophosphate (OP) insecticide  
D. None of the above

14. Naled is a(n) ________________ that has been registered since 1959 for use in the United States. It is used primarily for controlling adult mosquitoes, but Naled is also used on food and feed crops, and in greenhouses.

A. Chemical  
B. Organophosphate insecticide  
C. An organophosphate parasympathomimetic  
D. None of the above
15. Naled is applied as an ultra-low volume (ULV) spray. ULV sprayers dispense very fine aerosol droplets that stay aloft and kill mosquitoes on contact. ULV applications involve small quantities of pesticide active ingredient in relation to the size of the area treated.
A. True  B. False

**Topic 5- Insects Commonly Mistaken for Mosquitoes**

1. _______________ do not bite, and contrary to popular belief, they do not eat mosquitoes.
   A. Crane flies  C. Dance Flies
   B. Fleas  D. None of the above

2. When humans come in contact with _______________ infested vegetation, the larvae swarm over the entire body and it might be several hours before they settle down to feed.
   A. Redbugs  C. Chiggers
   B. Dixid Midge larvae  D. None of the above

3. _______________ are common around moist areas where vegetation is abundant and may be seen swarming at dusk along the edges of streams and lakes. The adults are short lived, usually being active less than a week.
   A. Crane flies  C. Mosquitoes
   B. Dixid Midges  D. None of the above

4. The _______________ are found in slow moving water, at the surface, and swim in a characteristic "U" shape. These midges lack a proboscis and scales on the wings.
   A. Redbugs  C. Dance Flies
   B. Dixid Midge larvae  D. None of the above

5. _______________ do not fly, but have strong hind legs which they use to jump from host to host. Dogs and cats are at risk of getting these creatures.
   A. Redbugs  C. Dance Flies
   B. Fleas  D. None of the above

6. In the U.S., the most common flea species carried by both cats and dogs is the _______________.
   A. Dog flea  C. Cat flea, Ctenocephalides felis
   B. Red flea  D. None of the above

7. Dance fleas are small (about ¼ inch long), black flies commonly found around decaying vegetation. They have large wings and long antennae, but they are weak flyers and do not move far from the breeding site.
   A. True  B. False

8. Adult mayflies though not even closely resembling mosquitoes, their seasonal occurrence at porch lights and on the walls of buildings near their _______________ invariably attracts the attention of some concerned residents.
   A. Land breeding site  C. Aquatic breeding sources
   B. Host sources  D. None of the above
9. ____________________ (Psychodidae) are small hairy flies that can move about very nimbly, but are weak fliers.
A. Crane flies  C. Mosquitoes
B. Owl Midges  D. None of the above

10. ___________________________ are of considerable public health importance because of their ability to transmit several viral, bacterial, and protozoal disease-causing organisms of humans and other animals.
A. Gnats  C. Phlebotomine sand flies
B. Owl Midges  D. None of the above

11. The _____________________________ males and females feed on nectar and other plant juices, but females require a blood meal in order to mature a second batch of eggs.
A. Crane flies  C. Mosquitoes
B. Phlebotomine sand flies  D. None of the above

12. _____________________________ (Trichoceridae) are often quite abundant during winter and spring. They so closely resemble mosquitoes that they are frequently mistaken for them.
A. Winter Crane Flies  C. Gnats
B. Owl Midges  D. None of the above

13. _____________________________ do not bite humans, and they don’t carry disease. But these species still can be annoying to homeowners.
A. Crane flies  C. Gnats
B. Winter Crane Flies  D. None of the above

14. _____________________________ (Anisopodidae) are some of the better known gnats, for they are attracted to light and can be found near windows, especially in spring time.
A. Winter Gnats  C. Wood Gnats
B. Owl Gnats  D. None of the above

15. _____________________________ adults are found on foliage in or near damp places, some are found around flowing sap. They are sometimes seen in small swarms. Adults appear in two variations: grayish black or reddish.
A. Winter Crane Flies  C. Wood Gnats
B. Owl Midges  D. None of the above
Mosquito Control CEU Training Awareness Assignment #2
Last Names - F to 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.

Topic 1 – Mosquito Introduction Section
Integrated Pest Management -Introduction
1. IPM uses a combination of ways to control mosquito populations with decisions based on ______________, such as keeping track or count of the numbers and types of mosquitoes in an area.
   A. Surveillance  C. Pests and vectors
   B. Pest prevention  D. None of the above

2. ______________ is a critical component to any successful IPM program because the results from the surveillance will help determine the appropriate response to an infestation.
   A. Pests and vectors  C. Water quality
   B. Surveillance  D. None of the above

3. Once mosquitoes have landed, they rely on ______________ to determine if we are an acceptable blood meal host.
   A. Transient waters  C. A number of short-range attractants
   B. Its life cycle  D. None of the above

4. Canines are quite susceptible to______________, a nematode that can be transmitted by certain mosquitoes.
   A. SLE   C. WNV
   B. Canine heartworm  D. None of the above

Mosquito Life Cycle Section
5. The type of standing water in which the mosquito chooses to lay her ______________ depends upon the species.
   A. Eggs, larvae, and pupae  C. Mosquito larva
   B. Eggs  D. None of the above

6. The presence of beneficial predators such as fish and dragonfly nymphs in permanent ponds, lakes, and streams usually keep these bodies of water relatively free of ______________.
   A. Eggs, larvae, and pupae  C. Mosquito larva
   B. Nest  D. None of the above
Wrigglers and Tumblers
7. The mosquitoes in the United States, all of which live in specific habitats, exhibit unique behaviors and bite different types of animals. Despite these differences, all mosquitoes share some common traits, such as _____________.
A. A two-year life span  C. Prolific mosquito breeding sites
B. A four-stage life cycle  D. None of the above

8. After the female mosquito obtains a blood meal, she lays her eggs directly on the surface of stagnant water, in a depression, or on the edge of a container where rainwater may collect and flood the eggs.
A. True  B. False

9. Eggs, larvae, and pupae must have a mother to develop.
A. True  B. False

10. Each raft may contain up to 1000 individual eggs.
A. True  B. False

11. The larva lives in the water, feeds, and develops into the third stage of the life cycle called a pupa or "__________________". The pupa also lives in the water, but no longer feeds.
A. Adults  C. Wriggler
B. Tumbler  D. None of the above

12. Finally, the mosquito emerges from the pupal case and the water as a______________, ready to bite.
A. Ergatoids  C. Fully developed adult female
B. Alates  D. None of the above

13. Single On Water: Anopheles and Toxorhynchites lay their eggs one at a time on ________________.
A. The water surface  C. The leaves of certain floating aquatic plants.
B. Above the waterline  D. None of the above

14. Single in Soil: most Aedes and Psorophora lay their eggs one at a time on a moist substrate, such as______________.
A. Decomposing leaf litter  C. Mud and decomposing leaf litter
B. Extremely polluted water  D. None of the above

Weather
15. Mosquito development and population dynamics are closely tied to weather. When and how much rain is received, wind speed and direction, maximum and minimum temperatures, and the total amount of heat energy accumulated are all critical to mosquito development.
A. True  B. False

Topic 2 – Mosquito Identification Section
1. The ________________ of most mosquito species have a siphon (breathing tube) for acquiring air from just above the surface of water while submerged.
A. Pupas  C. Larvae
B. Eggs  D. None of the above
2. Other identifying characteristics of Culiseta melanura larvae are a row of 8-14 setae running horizontally down the siphon and a double row of brown scales located on the sixth section of the abdomen.  
A. True B. False

3. Malaria was a serious plague in the United States for centuries until its final eradication in the 1950s. Despite the ostensible eradication, there are occasional cases of autochthonous (local) transmission in the U.S. vectored by An. quadrimaculatus in the east and Anopheles freeborni in the west.  
A. True B. False

4. Anopheles quadrimaculatus is historically the most important vector of ______________ in the eastern United States.  
A. SLE C. WNV  
B. Malaria D. None of the above

5. Culex pipiens, the Northern House Mosquito has a distribution that roughly includes the ______________ of the United States.  
A. Treeholes C. Effluent from sewage treatment plants  
B. Northern half D. None of the above

6. Although they occur in__________________, Culex pipiens reach their greatest numbers in urban and suburban areas and readily enter homes.  
A. Treeholes C. Effluent from sewage treatment plants  
B. Rural environments D. None of the above

7. The species utilizes temporary ground water that ranges from mildly to grossly polluted. The species also deposits its eggs in artificial containers, including tin cans, tires, and any refuse that allows stagnant water to puddle. The species is decidedly urban and reaches greatest numbers in large urban centers.  
A. True B. False

8. Meat packing plants and slaughter house drainage ponds support high populations of this species. Culex pipiens can always be collected in the __________________.  
A. Treeholes C. Effluent from sewage treatment plants  
B. Temporary ground water D. None of the above

9. In northern California, it currently plays only a lesser role as a carrier of human disease, while in southern California and the Gulf Coast region, it is a major carrier of Saint Louis encephalitis. It is also the best known carrier of ______________, a severe encephalitis virus newly arrived in the Americas that is spreading along the eastern seaboard.  
A. SLE C. WNV  
B. WEE D. None of the above

10. Culex tarsalis breeds in nearly every freshwater source except ______________. Larvae are found in all but the most polluted ground pools.  
A. Treeholes C. Effluent from sewage treatment plants  
B. Out-of-doors at night D. None of the above
11. Mosquitoes of the Culex tarsalis species have a _________________.
A. Bluntly rounded abdominal tip  C. Brownish strip with pale bands
B. Distinct ring around the proboscis  D. None of the above

12. As mosquitoes go, the Western Encephalitis Mosquito is one of the more easily recognizable, with its _________________.
A. Bluntly rounded abdominal tip  C. Brownish hair with pale bands
B. Distinctive scale patterns  D. None of the above

13. Species in the genus Culex are known as “standing-water” mosquitoes.
A. True  B. False

Effective Mosquito-Control Program
14. Surveys are essential for the planning, operation and evaluation of an effective mosquito-control program, whether for the prevention of mosquito-borne diseases or to reduce mosquito populations to levels permitting normal activities without undue discomfort.
A. True  B. False

15. Initial surveys identify the species of mosquitoes present and provide general information on locations, densities and disease potential. With this knowledge it may be possible to determine life cycles and feeding preferences; predict larval habitats, adult resting places and flight ranges; and perhaps even make preliminary recommendations for control programs.
A. True  B. False

Topic 3– Mosquito-Borne Diseases Section
1. Zika disease can be passed from a pregnant woman to her fetus. Infection during pregnancy can cause certain birth defects.
A. True  B. False

2. Encephalitis is ________________, and serious disease carried by mosquitoes. Its symptoms are severe headache, fever, vomiting, disorientation, chills, muscle aches and pains. It usually occurs in warm wet weather.
A. A birth defect  C. An untreatable, sometimes deadly
B. An infection  D. None of the above

3. _________________ is caused by viruses that are carried by mosquitoes. Symptoms appear three to six days after the person is bit by a mosquito. Dengue fever is mostly found in the tropics.
A. EEE virus  C. Dengue fever
B. Dog heartworm  D. None of the above

4. _________________ usually doesn’t cause death, but the symptoms can be severe and debilitating.
A. EEE virus  C. Chikungunya
B. Dog heartworm  D. None of the above
Canine Heartworm
5. Adult heartworms live in a dog’s heart, but young forms of the worm are found in their blood. Mosquitoes transmit the infection when they feed on the blood of an infected dog.
A. True  B. False

6. The dog heartworm parasite does not develop properly in humans and is not regarded as a human health problem.
A. True  B. False

7. _______________ is a Bunyavirus and is a zoonotic pathogen cycled between the daytime-biting treehole mosquito, Aedes triseriatus, and vertebrate amplifier hosts (chipmunks, tree squirrels) in deciduous forest habitats.
A. LAC virus  C. Brokebone fever
B. Dog heartworm  D. None of the above

8. _______________ is maintained over the winter by transovarial transmission in mosquito eggs. If the female mosquito is infected, she may lay eggs that carry the virus, and the adults coming from those eggs may be able to transmit the virus to chipmunks and to humans.
A. LAC virus  C. Brokebone fever
B. EEE virus  D. None of the above

9. _______________ is also caused by a virus transmitted to humans and equines by the bite of an infected mosquito.
A. Eastern equine encephalitis (EEE)  C. Beaver fever
B. Dog heartworm  D. None of the above

10. _______________ is an alphavirus that was first identified in the 1930's and currently occurs in focal locations along the eastern seaboard, the Gulf Coast and some inland Midwestern locations of the United States.
A. LAC virus  C. Brokebone fever
B. EEE virus  D. None of the above

11. _______________ occurs in natural cycles involving birds and Culiseta melanura, in some swampy areas nearly every year during the warm months.
A. EEE virus  C. Beaver fever
B. Dog heartworm  D. None of the above

12. Where _______________ resides or how it survives in the winter is unknown. It may be introduced by migratory birds in the spring or it may remain dormant in some yet undiscovered part of its life cycle.
A. LAC virus  C. Brokebone fever
B. EEE virus  D. None of the above

13. In this usual cycle of transmission, virus does not escape from these areas because the mosquito involved prefers to feed upon birds and does not usually bite humans or other mammals.
A. True  B. False
14. For reasons not fully understood, the virus may escape from enzootic foci in swamp areas in birds or bridge vectors such as Coquilletidia perturbans and Aedes sollicitans. These species feed on both birds and mammals and can transmit the virus to humans, horses, and other hosts.
A. True  B. False

15. Other mosquito species such as Ae. vexans and Culex nigripalpus can also transmit ___________________. When health officials maintain surveillance for EEE virus activity, this movement out of the swamp can be detected, and if the level of activity is sufficiently high, can recommend and undertake measures to reduce the risk to humans.
A. LAC virus  C. Brokebone fever
B. EEE virus  D. None of the above

**Topic 4– Mosquito Control Section**

1. ___________________ include the bacterial insecticides Bacillus thuringiensis israelensis and Bacillus sphaericus, the insect growth inhibitor methoprene, and the organophosphate insecticide temephos.
A. Naled  C. Oil formulations
B. Larvicides  D. None of the above

2. ___________________ of larvicides are also applied by mosquito controllers to breeding areas.
A. Naled  C. Tablet, pellet, granular, and briquette formulations
B. Oxygen  D. None of the above

3. ___________________ can be applied by hand and the product is labeled for use in known fish habitats.
A. Altosid XR Briquettes  C. Oil formulations
B. Naled products  D. None of the above

**Microbial Insecticides**

4. ___________________ is an insect growth regulator widely used by abatement districts to control mosquito larvae.
A. Naled  C. Methoprene (sold under the name Altosid)
B. Liquid oil  D. None of the above

5. ___________________ mimics a natural juvenile hormone, and when present in the larval habitat, it keeps immature insects from maturing into adults. Unable to metamorphose, the mosquitoes die in the pupal stage.
A. Methoprene  C. Bti (Bacillus thuringiensis israelensis)
B. Naled  D. None of the above

6. Pellets can be flushed down toilets into underground septic tanks known to be breeding house mosquitoes. The ________________ kills the mosquitoes without upsetting the septic system's bacterial digestive processes.
A. Methoprene  C. Naled
B. Liquid products  D. None of the above
7. ______________________, typically applied as high volume (low concentration) liquids with hand-held spray equipment using compounds with residual characteristics, are common in some U.S. locations and their use is growing.
A. ULV application C. Barrier treatments
B. An adulticide D. None of the above

8. ________________ is an organophosphate parasympathomimetic that binds irreversibly to cholinesterase.
A. Naled C. An organophosphate parasympathomimetic
B. Malathion D. None of the above

9. ____________________ is an insecticide of relatively low human toxicity; however, recent studies have shown that children with higher levels of malathion in their urine seem to be at an increased risk of attention deficit hyperactivity disorder.
A. Organophosphate insecticide C. Malathion
B. Naled D. None of the above

10. ________________ is a pesticide that is widely used in agriculture, residential landscaping, public recreation areas, and in public health pest control programs such as mosquito eradication. In the US, it is the most commonly used organophosphate insecticide.
A. Organophosphate insecticide C. An Phosphate parasympathomimetic
B. Malathion D. None of the above

11. ________________ is applied as an ultra-low volume (ULV) spray. ULV sprayers dispense very fine aerosol droplets that stay aloft and kill mosquitoes on contact.
A. Synergized pyrethrins 0.1% C. Phosphate insecticide
B. Malathion D. None of the above

12. The mosquito goes through four distinct stages during its life cycle: egg, larva, pupa, and adult. Malathion is an adulticide, used to kill adult mosquitoes.
A. True B. False

13. ULV applications involve small quantities of pesticide active ingredient in relation to the size of the area treated.
A. True B. False

14. Naled is an ________________ that has been registered since 1959 for use in the United States. It is used primarily for controlling adult mosquitoes, but Naled is also used on food and feed crops, and in greenhouses.
A. 0.1% Synergized pyrethrins C. Organophosphate insecticide
B. Treatment D. None of the above

15. Naled is ________________ used to kill adult mosquitoes. In mosquito control programs conducted by state or local authorities, Naled is applied by truck-mounted or aircraft-mounted sprayers.
A. An ULV C. A larvicide
B. An adulticide D. None of the above
Topic 5- Insects Commonly Mistaken for Mosquitoes

1. ______________________ are long, gangly insects that commonly resemble mosquitoes with their slender, jointed legs and elongated thorax.
   A. Mosquitoes          C. Crane flies
   B. Redbugs            D. None of the above

2. When humans come in contact with ______________________ infested vegetation, the larvae swarm over the entire body and it might be several hours before they settle down to feed.
   A. Bedbugs            C. Chiggers
   B. Dixid Midge larvae  D. None of the above

3. Dance Flies appear like ______________________ by the way they swarm in sunlit areas in backyards and other sheltered situations. The vertical movement of the swarming adults gives them their common name of Dance Flies.
   A. Mosquitoes          C. Crane flies
   B. Dixid Midge larvae  D. None of the above

4. The ______________________ are found in slow moving water, at the surface, and swim in a characteristic "U" shape. These midges lack a proboscis and scales on the wings.
   A. Mosquitoes          C. Dance Flies
   B. Dixid Midge larvae  D. None of the above

5. In the U.S., the most common flea species carried by both cats and dogs is the______________________.
   A. Dog flea          C. Cat flea, Ctenocephalides felis
   B. Red flea          D. None of the above

6. Compared with other flea species, the _______________ has a very wide host range. Wild animals carrying cat fleas include raccoons, opossum, skunks and foxes.
   A. Dog flea            C. Cat flea
   B. Red flea            D. None of the above

7. Mayflies (Ephemeroptera) are small (about ¼ inch long), black flies commonly found around decaying vegetation. They have large wings and long antennae, but they are weak flyers and do not move far from the breeding site.
   A. True          B. False

8. Adult mayflies though not even closely resembling mosquitoes, their seasonal occurrence at porch lights and on the walls of buildings near their _______________ invariably attracts the attention of some concerned residents.
   A. Land breeding site C. Aquatic breeding sources
   B. Sewage habitats    D. None of the above

9. The nymphs of mayflies develop in _______________ where they form an important part of the food chain. Adults are among the shortest lived in the insect world.
   A. Flowing sap       C. Winter and spring
   B. All types of aquatic habitats    D. None of the above
10. ____________________ (Psychodidae) are small hairy flies that can move about very nimbly, but are weak fliers.
A. Winter Crane Flies  C. Phlebotomine sand flies
B. Owl Midge s    D. None of the above

11. The ____________________ males and females feed on nectar and other plant juices, but females require a blood meal in order to mature a second batch of eggs. The blood meal hosts include white-tailed deer, horses, donkeys, mules, cattle, swine, raccoons, rodents, birds and humans.
A. Phlebotomine sand flies  C. Spring Crane Flies
B. Red fleas    D. None of the above

12. ____________________ (Trichoceridae) are often quite abundant during winter and spring. They so closely resemble mosquitoes that they are frequently mistaken for them.
A. Winter Crane Flies  C. Spring Crane Flies
B. Owl Midges    D. None of the above

13. ____________________ larvae are found in roots, fungi, decaying vegetation, rotting leaves, manure, and other vegetative material. The adults are readily attracted to lights.
A. Winter Crane Flies  C. Spring Crane Flies
B. Owl Midges    D. None of the above

14. ____________________ do not bite humans, and they don’t carry disease. But these species still can be annoying to homeowners.
A. Winter Crane Flies  C. Red fleas
B. Spring Crane Flies    D. None of the above

15. ____________________ adults are found on foliage in or near damp places, some are found around flowing sap. They are sometimes seen in small swarms. Adults appear in two variations: grayish black or reddish.
A. Red fleas  C. Wood Gnats
B. Owl Gnats     D. None of the above
Mosquito Control CEU Training Awareness Assignment #3  
Last Names L to P  

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Topic 1 – Mosquito Introduction Section
1. Aedes adults will oviposit near the edge of the swamp or within tussocks of vegetation, requiring later flooding to ______________. As with transient waters, there is a seasonal change in the vegetation, water quality, and mosquito species present.
   A. Begin its life cycle  
   B. Look for a blood meal  
   C. Inundate the eggs for hatching  
   D. None of the above

2. The type of standing water in which the mosquito chooses to lay her __________ depends upon the species.
   A. Nest  
   B. Raft  
   C. Eggs  
   D. None of the above

3. The presence of beneficial predators such as fish and dragonfly nymphs in permanent ponds, lakes, and streams usually keep these bodies of water relatively free of ____________.
   A. Eggs, larvae, and pupae  
   B. Raft  
   C. Mosquito larva  
   D. None of the above

4. The mosquito goes through four distinct stages during its life cycle.
   A. True  
   B. False

Wrigglers and Tumblers
5. After the female mosquito obtains a blood meal, she lays her eggs directly on the surface of stagnant water, in a depression, or on the edge of a container where rainwater may collect and flood the eggs.
   A. True  
   B. False

6. The eggs hatch and a mosquito larva or "__________________" emerges.
   A. Alates  
   B. Ergatoids  
   C. Wriggler  
   D. None of the above

7. Finally, the mosquito emerges from the pupal case and the water as a ______________, ready to bite.
   A. Ergatoids  
   B. Alates  
   C. Fully developed adult female  
   D. None of the above

8. Some female mosquitoes lay their ______________directly on the water surface.
   A. Ergatoids  
   B. Raft  
   C. Eggs  
   D. None of the above
9. Each raft may contain up to 400 individual eggs.
   A. True  B. False

10. Some mosquitoes have only one generation per year, whereas others may have four or more.
    A. True  B. False

11. Adults may fly 1 to 2 miles, but usually rest in grass, shrubbery, or other foliage close to the water breeding area.
    A. True  B. False

12. ____________________ are ready to bite one to two days after adult emergence.
    A. Ergatoids  C. Female mosquitoes
    B. Alates  D. None of the above

**Mosquito Egg Classification**

13. Single On Water: Anopheles and Toxorhynchites lay their eggs one at a time on
    ________________.
    A. The water surface  C. The leaves of certain floating aquatic plants.
    B. Above the waterline  D. None of the above

14. Single On Cavity Walls: Wyeomyia, Orthopodomyia, and certain Aedes deposit eggs in tree holes, water-holding plants, or artificial containers. The eggs are placed
    ________________.
    A. The water surface  C. The leaves of certain floating aquatic plants.
    B. Above the waterline  D. None of the above

15. On Plants: Mansonia eggs are deposited on the underside, and sometimes on top of
    ________________.
    A. The trees  C. The leaves of certain floating aquatic plants.
    B. Above the waterline  D. None of the above

**Topic 2 – Mosquito Identification Section**

1. The black-tailed mosquito, Culiseta melanura, belongs to the family Culicidae. This species of mosquito is considered unusual because it overwinters as larvae while most mosquito species overwinter as ____________.
   A. Adults  C. Either adults or eggs
   B. Pupas  D. None of the above

2. Culiseta melanura is important because of its role in the transmission cycle of eastern equine encephalitis virus and potentially ________________.
   A. SLE  C. WNV (West Nile virus)
   B. WEE  D. None of the above

3. The ________________ of most mosquito species have a siphon (breathing tube) for acquiring air from just above the surface of water while submerged.
   A. Pupas  C. Larvae
   B. Eggs  D. None of the above
4. Malaria was a serious plague in the United States for centuries until its final eradication in the 1950s. Despite the ostensible eradication, there are occasional cases of autochthonous (local) transmission in the U.S. vectored by An. quadrimaculatus in the east and Anopheles freeborni in the west.
A. True B. False

5. Culex pipiens, the Northern House Mosquito has a distribution that roughly includes the ____________ of the United States.
A. Out-of-doors at night C. Northern half
B. Southern parts D. None of the above

6. Although they occur in ______________ , Culex pipiens reach their greatest numbers in urban and suburban areas and readily enter homes.
A. Treeholes C. Effluent from sewage treatment plants
B. Rural environments D. None of the above

7. Culex pipiens are known to vector ________________
A. SLE C. WNV
B. WEE D. None of the above

8. The species utilizes temporary ground water that ranges from mildly to grossly polluted. The species also deposits its eggs in artificial containers, including tin cans, tires, and any refuse that allows stagnant water to puddle. The species is decidedly urban and reaches greatest numbers in large urban centers.
A. True B. False

9. Catch basins and storm drains provide ideal habitat for Cx. pipiens. The species becomes particularly abundant in areas where raw sewage leaks into ________________.
A. Treeholes C. Effluent from sewage treatment plants
B. Subterranean drainage systems D. None of the above

10. Meat packing plants and slaughter house drainage ponds support high populations of this species. Culex pipiens can always be collected in the ________________.
A. Treeholes C. Effluent from sewage treatment plants
B. Temporary ground water D. None of the above

11. In northern California, it currently plays only a lesser role as a carrier of human disease, while in southern California and the Gulf Coast region, it is a major carrier of Saint Louis encephalitis. It is also the best known carrier of ________________, a severe encephalitis virus newly arrived in the Americas that is spreading along the eastern seaboard.
A. SLE C. WNV
B. WEE D. None of the above

12. Culex pipiens is a serious pest, called the "house mosquito" because it commonly develops in small containers around the home. It shows great skill in finding ways to get into the house, where it feeds on ________________. It also occurs in containers and sumps on farms and industrial plants, in polluted waters, and will feed out-of-doors at night.
A. Mammals C. The occupants at night
B. Temporary ground water D. None of the above
13. Mosquitoes of the Culex tarsalis species have a ___________________.
A. Bluntly rounded abdominal tip  C. Brownish strip with pale bands
B. Distinct ring around the proboscis  D. None of the above

14. Western Encephalitis Mosquito (Culex tarsalis) is medium-sized, dark mosquito that has a broad white band across the middle of the proboscis and the lower leg segments. In addition to being a potential vector of ______________ these species is the most important vector of Western Equine encephalitis (WEE) and SLE.
A. SLE  C. WNV
B. WEE  D. None of the above

15. Species in the genus Culex are known as “standing-water” mosquitoes.
A. True  B. False

**Topic 3– Mosquito-Borne Diseases Section**

1. Yellow fever is a virus infection of monkeys that can either be transmitted from monkey to human or from human to human in tropical areas of the world.
A. True  B. False

2. Encephalitis is _____________________ and serious disease carried by mosquitoes. Its symptoms are severe headache, fever, vomiting, disorientation, chills, muscle aches and pains. It usually occurs in warm wet weather.
A. A birth defect  C. An untreatable, sometimes deadly
B. Dangerous parasite  D. None of the above

3. _____________________ is a dangerous parasitic disease common in tropical and subtropical areas. It is transmitted by the female Anopheles mosquito.
A. EEE virus  C. Malaria
B. Dog heartworm  D. None of the above

4. _________________ is spread to people by the bite of an infected mosquito. The most common symptoms of infection are fever and joint pain.
A. EEE virus  C. Chikungunya virus
B. Dog heartworm  D. None of the above

5. If a fully engorged mosquito with ______________ positive blood is squashed on the skin, there would be insufficient transfer of virus to produce infection.
A. EEE virus  C. HIV
B. Dog heartworm  D. None of the above

**Canine Heartworm**

6. The dog heartworm parasite does not develop properly in humans and is not regarded as a human health problem.
A. True  B. False

7. _________________ is a Bunyavirus and is a zoonotic pathogen cycled between the daytime-biting treehole mosquito, Aedes triseriatus, and vertebrate amplifier hosts (chipmunks, tree squirrels) in deciduous forest habitats.
A. LAC virus  C. Brokebone fever
B. Dog heartworm  D. None of the above
8. _______________ is maintained over the winter by transovarial transmission in mosquito eggs. If the female mosquito is infected, she may lay eggs that carry the virus, and the adults coming from those eggs may be able to transmit the virus to chipmunks and to humans.
   - A. LAC virus
   - B. EEE virus
   - C. Brokebone fever
   - D. None of the above

9. _______________ is also caused by a virus transmitted to humans and equines by the bite of an infected mosquito.
   - A. Eastern equine encephalitis (EEE)
   - B. Dog heartworm
   - C. Beaver fever
   - D. None of the above

10. _______________ is an alphavirus that was first identified in the 1930’s and currently occurs in focal locations along the eastern seaboard, the Gulf Coast and some inland Midwestern locations of the United States.
    - A. LAC virus
    - B. EEE virus
    - C. Brokebone fever
    - D. None of the above

11. _______________ occurs in natural cycles involving birds and Culiseta melanura, in some swampy areas nearly every year during the warm months.
    - A. LAC virus
    - B. EEE virus
    - C. Brokebone fever
    - D. None of the above

12. Where _______________ resides or how it survives in the winter is unknown. It may be introduced by migratory birds in the spring or it may remain dormant in some yet undiscovered part of its life cycle.
    - A. EEE virus
    - B. Dog heartworm
    - C. Beaver fever
    - D. None of the above

13. In this usual cycle of transmission, virus does not escape from these areas because the mosquito involved prefers to feed upon birds and does not usually bite humans or other mammals.
    - A. True
    - B. False

14. For reasons not fully understood, the virus may escape from enzootic foci in swamp areas in birds or bridge vectors such as Coquilletidia perturbans and Aedes sollicitans. These species feed on both birds and mammals and can transmit the virus to humans, horses, and other hosts.
    - A. True
    - B. False

15. Other mosquito species such as Ae. vexans and Culex nigripalpus can also transmit _______________. When health officials maintain surveillance for EEE virus activity, this movement out of the swamp can be detected, and if the level of activity is sufficiently high, can recommend and undertake measures to reduce the risk to humans.
    - A. EEE virus
    - B. Dog heartworm
    - C. Beaver fever
    - D. None of the above
Topic 4– Mosquito Control Section

1. ______________________ include the bacterial insecticides Bacillus thuringiensis israelensis and Bacillus sphaericus, the insect growth inhibitor methoprene, and the organophosphate insecticide temephos.
   A. DDT and Chlordane   C. Hydrogen sulfide
   B. Larvicides           D. None of the above

2. ______________________ are applied directly to water using backpack sprayers and truck or aircraft-mounted sprayers.
   A. Oxygen              C. Hydrogen sulfide
   B. Liquid larvicide products  D. None of the above

3. _____________________, 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. Mosquito Dunks       C. DDT and Chlordane
   B. Golden Bear 1111     D. None of the above

4. ______________________ is another safe material for control of mosquito larvae. It is an insect hormone that retards the development of larvae (disrupts molting) and prevents mosquitoes from developing into adults.
   A. Methoprene (Altosid XR)   C. Hydrogen sulfide
   B. Liquid larvicide products  D. None of the above

5. ______________________ can be applied by hand and the product is labeled for use in known fish habitats.
   A. Altosid XR Briquettes   C. Tablet, pellet, granular, and briquette formulations
   B. Golden Bear 1111       D. None of the above

Microbial Insecticides

6. The product known as **Bti** (Bacillus thuringiensis israelensis) is not as effective as chemical insecticides.
   A. True    B. False

7. ______________________ is an insect growth regulator widely used by abatement districts to control mosquito larvae.
   A. Oil       C. Methoprene (sold under the name Altosid)
   B. DDT and Chlordane D. None of the above

8. Pellets can be flushed down toilets into underground septic tanks known to be breeding house mosquitoes. The ________________ kills the mosquitoes without upsetting the septic system's bacterial digestive processes.
   A. DDT and Chlordane   C. Naled
   B. Methoprene          D. None of the above

9. Space sprays or aerosol "bombs," containing ______________, are effective against adult mosquitoes. Frequent treatments may be needed during problem periods.
   A. Synergized pyrethrins 0.1%   C. Phosphate insecticide
   B. DDT and Chlordane          D. None of the above
10. ________________ is an organophosphate parasympathomimetic that binds irreversibly to cholinesterase.
   A. Naled  C. Synergized pyrethrins 0.1%
   B. Malathion  D. None of the above

11. ________________ is a pesticide that is widely used in agriculture, residential landscaping, public recreation areas, and in public health pest control programs such as mosquito eradication. In the US, it is the most commonly used organophosphate insecticide.
   A. Naled  C. Synergized pyrethrins 0.1%
   B. Malathion  D. None of the above

12. ULV applications involve large quantities of pesticide active ingredient in relation to the size of the pest target treated.
   A. True  B. False

13. Naled is applied as an ultra-low volume (ULV) spray. ULV sprayers dispense very fine aerosol droplets that stay aloft and kill mosquitoes on contact. ULV applications involve small quantities of pesticide active ingredient in relation to the size of the area treated.
   A. True  B. False

14. Naled is an ________________ that has been registered since 1959 for use in the United States. It is used primarily for controlling adult mosquitoes, but Naled is also used on food and feed crops, and in greenhouses.
   A. Synergized pyrethrins 0.1%  C. Organophosphate insecticide
   B. Treatment  D. None of the above

15. Naled is _______________ used to kill adult mosquitoes. In mosquito control programs conducted by state or local authorities, Naled is applied by truck-mounted or aircraft-mounted sprayers.
   A. ULV application  C. An organophosphate (OP) insecticide
   B. An adulticide  D. None of the above

**Topic 5- Insects Commonly Mistaken for Mosquitoes**

1. ________________ are long, gangly insects that commonly resemble mosquitoes with their slender, jointed legs and elongated thorax.
   A. Mosquitoes  C. Crane flies
   B. Bedbugs  D. None of the above

2. When humans come in contact with ________________ infested vegetation, the larvae swarm over the entire body and it might be several hours before they settle down to feed.
   A. Bedbugs  C. Chiggers
   B. Dixid Midge larvae  D. None of the above

3. Dance Flies appear like ________________ by the way they swarm in sunlit areas in backyards and other sheltered situations. The vertical movement of the swarming adults gives them their common name of Dance Flies.
   A. Mosquitoes  C. Crane flies
   B. Redbugs  D. None of the above
4. The ____________________ are found in slow moving water, at the surface, and swim in a characteristic "U" shape. These midges lack a proboscis and scales on the wings.
   A. Mosquitoes    C. Crane flies
   B. Dixid Midge larvae    D. None of the above

5. In the U.S., the most common flea species carried by both cats and dogs is the___________.
   A. Dog flea    C. Cat flea, Ctenocephalides felis
   B. Red flea    D. None of the above

6. Compared with other flea species, the _______________ has a very wide host range. 
   Wild animals carrying cat fleas include raccoons, opossum, skunks and foxes.
   A. Dog flea    C. Cat flea
   B. Red flea    D. None of the above

7. Fungus Gnats (Sciariidae) are small (about ¼ inch long), black flies commonly found around decaying vegetation.
   A. True    B. False

8. Adult mayflies though not even closely resembling mosquitoes, their seasonal occurrence at porch lights and on the walls of buildings near their _______________ invariably attracts the attention of some concerned residents.
   A. Land breeding site    C. Aquatic breeding sources
   B. Host sources    D. None of the above

9. The nymphs of mayflies develop in _______________ where they form an important part of the food chain. Adults are among the shortest lived in the insect world.
   A. Flowing sap    C. Land breeding site
   B. All types of aquatic habitats    D. None of the above

10. ____________________ (Psychodidae) are small hairy flies that can move about very nimbly, but are weak fliers.
    A. Crane flies    C. Winter Crane Flies
    B. Owl Midges    D. None of the above

11. ____________________ are of considerable public health importance because of their ability to transmit several viral, bacterial, and protozoal disease-causing organisms of humans and other animals.
    A. Winter Crane Flies    C. Phlebotomine sand flies
    B. Owl Midges    D. None of the above

12. ____________________ larvae are found in roots, fungi, decaying vegetation, rotting leaves, manure, and other vegetative material. The adults are readily attracted to lights.
    A. Winter Crane Flies    C. Phlebotomine sand flies
    B. Owl Midges    D. None of the above

13. ____________________ do not bite humans, and they don’t carry disease. But these species still can be annoying to homeowners.
    A. Crane flies    C. Mosquitoes
    B. Winter Crane Flies    D. None of the above
14. ____________ (Anisopodidae) are some of the better known gnats, for they are attracted to light and can be found near windows, especially in spring time. The adults can be found all year long, though.
A. Crane flies  C. Mosquitoes
B. Wood Gnats  D. None of the above

15. ____________ adults are found on foliage in or near damp places, some are found around flowing sap. They are sometimes seen in small swarms. Adults appear in two variations: grayish black or reddish.
A. Winter Crane Flies  C. Wood Gnats
B. Owl Midges  D. None of the above
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.

Topic 1 – Mosquito Introduction Section

Integrated Pest Management -Introduction
1. IPM is a science-based and common-sense approach for______________, vectors, such as mosquitoes.
   A. Managing pests   C. Resident education and pest monitoring
   B. Surveillance    D. None of the above

2. _______________ is a critical component to any successful IPM program because the results from the surveillance will help determine the appropriate response to an infestation.
   A. Surveillance   C. Lower levels of infestations
   B. Pest prevention  D. None of the above

3. Once mosquitoes have landed, they rely on _______________to determine if we are an acceptable blood meal host.
   A. Transient waters   C. A number of short-range attractants
   B. Water quality   D. None of the above

4. Canines are quite susceptible to__________________, a nematode that can be transmitted by certain mosquitoes.
   A. SLE   C. WNV
   B. Canine heartworm  D. None of the above

Mosquito Life Cycle Section
5. The type of standing water in which the mosquito chooses to lay her ______________depends upon the species.
   A. Eggs, larvae, and pupae   C. Mosquito larva
   B. Eggs   D. None of the above

6. The presence of beneficial predators such as fish and dragonfly nymphs in permanent ponds, lakes, and streams usually keep these bodies of water relatively free of ______________.
   A. Eggs, larvae, and pupae   C. Mosquito larva
   B. Nests   D. None of the above

Wrigglers and Tumblers
7. The mosquitoes in the United States, all of which live in specific habitats, exhibit unique behaviors and bite different types of animals. Despite these differences, all mosquitoes share some common traits, such as ______________.
   A. A two-year life span   C. Prolific mosquito breeding sites
   B. A four-stage life cycle   D. None of the above
8. Mosquitoes may overwinter as eggs, ________________.
   A. Fertilized adult females or larvae  C. Ergatoids
   B. Female mosquitoes  D. None of the above

9. Some female mosquitoes lay their eggs directly on the water surface.
   A. True  B. False

10. Eggs, larvae, and pupae must have water to develop.
    A. True  B. False

11. Adults may fly 500 to 1000 miles, but usually rest in grass, shrubbery, or other foliage close to the water breeding area.
    A. True  B. False

**Mosquito Egg Classification**

12. Mosquito eggs are generally square in shape, tapered at the top and square at the bottom.
    A. True  B. False

13. Each mosquito species prefers certain localities for depositing eggs. Some prefer very clean water, others slightly polluted water, while others thrive in ________________.
    A. Population dynamics  C. Decomposing leaf litter
    B. Extremely polluted water  D. None of the above

14. Single On Water: Anopheles and Toxorhynchites lay their eggs one at a time on ________________.
    A. Underground  C. Standing water
    B. The water surface  D. None of the above

15. Single in Soil: most Aedes and Psorophora lay their eggs one at a time on a moist substrate, such as ________________.
    A. Decomposing leaf litter  C. Mud and decomposing leaf litter
    B. Extremely polluted water  D. None of the above

**Topic 2 – Mosquito Identification Section**

1. Culiseta melanura larvae have long siphons that can be distinguished from those of other mosquito larvae by the presence of two or three setae (hairs) located at the very base of their siphons.
   A. True  B. False

2. Culiseta melanura is a medium-sized mosquito that resembles Culex species because of its ________________.
   A. Bluntly rounded abdominal tip  C. Brownish color with pale bands
   B. Its distinctive scale patterns  D. None of the above
3. Malaria was a serious plague in the United States for centuries until its final eradication in the 1950s. Despite the ostensible eradication, there are occasional cases of autochthonous (local) transmission in the U.S. vectored by An. quadrimaculatus in the east and Anopheles freeborni in the west.
A. True  B. False

4. Culex pipiens, the Northern House Mosquito has a distribution that roughly includes the ________________ of the United States.
A. Treeholes  C. Northern half
B. Southern parts  D. None of the above

5. Culex pipiens species is ________________ around the abdominal segments. The quickly developing larvae may be continuously present spring through fall.
A. Bluntly colored  C. Medium-sized, brownish with pale bands
B. Distinctive, scale patterns  D. None of the above

6. Catch basins and storm drains provide ideal habitat for Cx. pipiens. The species becomes particularly abundant in areas where raw sewage leaks into ________________ .
A. Treeholes  C. Effluent from sewage treatment plants
B. Subterranean drainage systems  D. None of the above

7. Meat packing plants and slaughter house drainage ponds support high populations of this species. Culex pipiens can always be collected in the ________________ .
A. Treeholes  C. Effluent from sewage treatment plants
B. Subterranean drainage systems  D. None of the above

8. Culex pipiens' main host is humans, but it also feeds freely on a wide variety of warm-blooded vertebrates, including birds.
A. True  B. False

9. In northern California, it currently plays only a lesser role as a carrier of human disease, while in southern California and the Gulf Coast region; it is a major carrier of Saint Louis encephalitis. It is also the best known carrier of ________________, a severe encephalitis virus newly arrived in the Americas that is spreading along the eastern seaboard.
A. SLE  C. WNV
B. WEE  D. None of the above

10. Mosquitoes of the Culex tarsalis species have a ________________ .
A. Bluntly rounded abdominal tip  C. Brownish strip with pale bands
B. Distinct ring around the proboscis  D. None of the above

11. Western Encephalitis Mosquito (Culex tarsalis) is medium-sized, dark mosquito that has a broad white band across the middle of the proboscis and the lower leg segments. In addition to being a potential vector of ________________, this species is the most important vector of Western Equine encephalitis (WEE) and SLE.
A. SLE  C. WNV
B. WEE  D. None of the above
12. The legs have white banding on each side of the joints, and the proboscis is adorned with a___________.
   A. Distinctive scale pattern  C. Bright white band of scales in the middle
   B. Distinct ring around the proboscis  D. None of the above

13. Culex eggs are laid one at a time, but attached together to form___________.
   A. Larvae  C. A raft of 100 or less eggs
   B. A raft of 100 or more eggs  D. None of the above

14. Woodland Malaria mosquitoes have three life stages: egg, larva, and adult. The immature stages need standing water to complete their life cycle.
   A. True  B. False

Effective Mosquito-Control Program
15. Initial surveys identify the species of mosquitoes present and provide general information on locations, densities and disease potential. With this knowledge it may be possible to determine life cycles and feeding preferences; predict larval habitats, adult resting places and flight ranges; and perhaps even make preliminary recommendations for control programs.
   A. True  B. False

Topic 3– Mosquito-Borne Diseases Section
1. Zika disease is spread mostly by the bite of an infected Aedes species mosquito (Ae. aegypti and Ae. albopictus). These mosquitoes bite_______________.
   A. Birds as blood meal hosts  C. During the day and night
   B. Infected dogs  D. None of the above

2. Zika disease can be passed from a pregnant woman to her fetus. Infection during pregnancy can cause certain birth defects.
   A. True  B. False

3. Encephalitis is ____________________, and serious disease carried by mosquitoes. Its symptoms are severe headache, fever, vomiting, disorientation, chills, muscle aches and pains. It usually occurs in warm wet weather.
   A. A birth defect  C. An untreatable, sometimes deadly
   B. An slight infection  D. None of the above

4. ________________ is spread to people by the bite of an infected mosquito. The most common symptoms of infection are fever and joint pain.
   A. Chikungunya virus  C. LAC virus
   B. Dog heartworm  D. None of the above

5. ________________ usually doesn’t cause death, but the symptoms can be severe and debilitating.
   A. EEE virus  C. Chikungunya
   B. Dog heartworm  D. None of the above
6. If a fully engorged mosquito with ______________ positive blood is squashed on the skin, there would be insufficient transfer of virus to produce infection.
   A. EEE virus       C. HIV
   B. Dog heartworm   D. None of the above

**Canine Heartworm**

7. _______________ is a Bunyavirus and is a zoonotic pathogen cycled between the daytime-biting treehole mosquito, Aedes triseriatus, and vertebrate amplifier hosts (chipmunks, tree squirrels) in deciduous forest habitats.
   A. LAC virus       C. Brokebone fever
   B. EEE virus       D. None of the above

8. ________________is maintained over the winter by transovarial transmission in mosquito eggs. If the female mosquito is infected, she may lay eggs that carry the virus, and the adults coming from those eggs may be able to transmit the virus to chipmunks and to humans.
   A. LAC virus       C. Brokebone fever
   B. Dog heartworm   D. None of the above

9. ________________ is also caused by a virus transmitted to humans and equines by the bite of an infected mosquito.
   A. Eastern equine encephalitis (EEE)       C. Beaver fever
   B. Dog heartworm                           D. None of the above

10. _______________ is an alphavirus that was first identified in the 1930's and currently occurs in focal locations along the eastern seaboard, the Gulf Coast and some inland Midwestern locations of the United States.
    A. EEE virus       C. Beaver fever
    B. Dog heartworm   D. None of the above

11. ________________ occurs in natural cycles involving birds and Culiseta melanura, in some swampy areas nearly every year during the warm months.
    A. LAC virus       C. Brokebone fever
    B. EEE virus       D. None of the above

12. Where ________________ resides or how it survives in the winter is unknown. It may be introduced by migratory birds in the spring or it may remain dormant in some yet undiscovered part of its life cycle.
    A. EEE virus       C. Beaver fever
    B. Dog heartworm   D. None of the above

13. In this usual cycle of transmission, virus does not escape from these areas because the mosquito involved prefers to feed upon birds and does not usually bite humans or other mammals.
    A. True       B. False

14. For reasons not fully understood, the virus may escape from enzootic foci in swamp areas in birds or bridge vectors such as Coquilletidia perturbans and Aedes sollicitans.
    A. True       B. False
15. Other mosquito species such as Ae. vexans and Culex nigripalpus can also transmit _______________. When health officials maintain surveillance for EEE virus activity, this movement out of the swamp can be detected, and if the level of activity is sufficiently high, can recommend and undertake measures to reduce the risk to humans.
A. LAC virus  C. Brokebone fever
B. EEE virus  D. None of the above

Topic 4– Mosquito Control Section

Microbial Insecticides
1. The product known as Bti (Bacillus thuringiensis israelensis) can be as effective as chemical insecticides.
A. True  B. False

2. When the bacteria Bti encysts, it produces a protein crystal toxic to mosquito and midge larvae. Once the bacteria have been ingested, the toxin disrupts the lining of the larvae's intestine. It has no effect on a vast array of other aquatic organisms except midges in the same habitat.
A. True  B. False

3. ________________ is an insect growth regulator widely used by abatement districts to control mosquito larvae.
A. Naled  C. Methoprene (sold under the name Altosid)
B. Oxygen  D. None of the above

4. ________________ mimics a natural juvenile hormone, and when present in the larval habitat, it keeps immature insects from maturing into adults. Unable to metamorphose, the mosquitoes die in the pupal stage.
A. Methoprene  C. Naled
B. Liquid larvicide products  D. None of the above

5. Vector control technicians sometimes use ______________ to reach larval sources that would otherwise be difficult or dangerous to treat.
A. Naled  C. Bti strains
B. Methoprene  D. None of the above

6. Pellets can be flushed down toilets into underground septic tanks known to be breeding house mosquitoes. The _______________ kills the mosquitoes without upsetting the septic system's bacterial digestive processes.
A. Altosid XR Briquettes  C. Naled
B. Methoprene  D. None of the above

7. State and local agencies commonly use the organophosphate insecticides Malathion and Naled and the synthetic pyrethroid insecticides ______________ for adult mosquito control. Always follow the pesticide label's instructions.
A. Malathion and Naled  C. Permethrin, Resmethrin, and Sumithrin
B. Synergized pyrethrins 0.1%  D. None of the above
8. Mosquito adulticides are applied as ultra-low volume (ULV) sprays. ULV sprayers dispense very fine aerosol droplets that stay aloft and kill flying mosquitoes on contact.
A. True  B. False

9. Space sprays or aerosol "bombs," containing ____________, are effective against adult mosquitoes. Frequent treatments may be needed during problem periods.
A. Synergized pyrethrins 0.1%  C. Organophosphate insecticide
B. Malathion  D. None of the above

10. ________________________, typically applied as high volume (low concentration) liquids with hand-held spray equipment using compounds with residual characteristics, are common in some U.S. locations and their use is growing.
A. An adulticide  C. Barrier treatments
B. Naled  D. None of the above

11. ________________ is an organophosphate parasympathomimetic which binds irreversibly to cholinesterase.
A. Naled  C. An organophosphate parasympathomimetic
B. Malathion  D. None of the above

12. ________________ is an insecticide of relatively low human toxicity; however recent studies have shown that children with higher levels of malathion in their urine seem to be at an increased risk of attention deficit hyperactivity disorder.
A. ULV application  C. An organophosphate (OP) insecticide
B. Malathion  D. None of the above

13. ________________ is a pesticide that is widely used in agriculture, residential landscaping, public recreation areas, and in public health pest control programs such as mosquito eradication. In the US, it is the most commonly used organophosphate insecticide.
A. Synergized pyrethrins 0.1%  C. Organophosphate insecticide
B. Malathion  D. None of the above

14. The mosquito goes through five distinct stages during its life cycle: egg, larva, Wigglier, pupa, and adult. Malathion is an adulticide, used to kill adult mosquitoes.
A. True  B. False

15. Naled is ________________ used to kill adult mosquitoes. In mosquito control programs conducted by state or local authorities, Naled is applied by truck-mounted or aircraft-mounted sprayers.
A. An adulticide  C. Malathion
B. Spray  D. None of the above

**Topic 5- Insects Commonly Mistaken for Mosquitoes**

1. Larvae of chiggers, commonly called ________________, attack humans and dogs during the larval stage.
A. Mosquitoes  C. Crane flies
B. Redbugs  D. None of the above
2. ____________________ are long, gangly insects that commonly resemble mosquitoes with their slender, jointed legs and elongated thorax.
A. Mosquitoes  C. Crane flies
B. Redbugs  D. None of the above

3. Dance Flies appear like __________________ by the way they swarm in sunlit areas in backyards and other sheltered situations. The vertical movement of the swarming adults gives them their common name of Dance Flies.
A. Mosquitoes  C. Crane flies
B. Dixid Midge larvae  D. None of the above

4. The ______________________ are found in slow moving water, at the surface, and swim in a characteristic "U" shape. These midges lack a proboscis and scales on the wings.
A. Redbugs  C. Dance Flies
B. Dixid Midge larvae  D. None of the above

5. Applications of insecticides targeting the Dixid Midge adult stage are not efficient. While this type of application may kill biting midges active on a given night, they are continually dispersing from the larval habitat and entering areas of human activity.
A. True  B. False

6. ____________________ do not fly, but have strong hind legs which they use to jump from host to host. Dogs and cats are at risk of getting these creatures.
A. Crane flies  C. Mosquitoes
B. Fleas  D. None of the above

7. In the U.S., the most common flea species carried by both cats and dogs is the__________________.
A. Dog flea  C. Cat flea, Ctenocephalides felis
B. Red flea  D. None of the above

8. Compared with other flea species, the ______________ has a very wide host range. Wild animals carrying cat fleas include raccoons, opossum, skunks and foxes.
A. Dog flea  C. Cat flea
B. Red flea  D. None of the above

9. Adult Fungus Gnats are recognized by the way they hold their wings at rest and the presence of two or three long "caudal" filaments at the tip of the abdomen.
A. True  B. False

10. Adult mayflies though not even closely resembling mosquitoes, their seasonal occurrence at porch lights and on the walls of buildings near their _______________ invariably attracts the attention of some concerned residents.
A. Land breeding site  C. Aquatic breeding sources
B. Lights  D. None of the above

11. ____________________ (Psychodidae) are small hairy flies that can move about very nimbly, but are weak fliers.
A. Crane flies  C. Mosquitoes
B. Owl Midges  D. None of the above
12. The ___________________ males and females feed on nectar and other plant juices, but females require a blood meal in order to mature a second batch of eggs. The blood meal hosts include white-tailed deer, horses, donkeys, mules, cattle, swine, raccoons, rodents, birds and humans.
A. Spring Crane Flies  C. Phlebotomine sand flies
B. Owl Midges  D. None of the above

13. ________________ (Trichoceridae) are often quite abundant during winter and spring. They so closely resemble mosquitoes that they are frequently mistaken for them.
A. Winter Crane Flies  C. Phlebotomine sand flies
B. Spring Crane Flies  D. None of the above

14. ________________ (Anisopodidae) are some of the better known gnats, for they are attracted to light and can be found near windows, especially in spring time. The adults can be found all year long, though.
A. Spring Crane Flies  C. Wood Gnats
B. Owl Midges  D. None of the above

15. ________________ adults are found on foliage in or near damp places, some are found around flowing sap. They are sometimes seen in small swarms. Adults appear in two variations: grayish black or reddish.
A. Winter Crane Flies  C. Wood Gnats
B. Owl Midges  D. None of the above
Mosquito Control CEU Training Awareness Assignment #5
Last Names S to Z

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Topic 1 – Mosquito Introduction Section

Integrated Pest Management -Introduction
1. IPM uses a combination of ways to control mosquito populations with decisions based on ________________, such as keeping track or count of the numbers and types of mosquitoes in an area.
   A. Lower levels of infestations   C. Resident education
   B. Surveillance              D. None of the above

2. Once mosquitoes have landed, they rely on _______________ to determine if we are an acceptable blood meal host.
   A. Its life cycle             C. Water quality
   B. A number of short-range attractants  D. None of the above

3. Aedes adults will oviposit near the edge of the swamp or within tussocks of vegetation, requiring later flooding to _______________. As with transient waters, there is a seasonal change in the vegetation, water quality, and mosquito species present.
   A. Begin its life cycle       C. Inundate the eggs for hatching
   B. Begin the reproduction    D. None of the above

Mosquito Life Cycle Section
4. The type of standing water in which the mosquito chooses to lay her _______________ depends upon the species.
   A. Eggs, larvae, and pupae   C. Mosquito larva
   B. Eggs                    D. None of the above

5. The presence of beneficial predators such as fish and dragonfly nymphs in permanent ponds, lakes, and streams usually keep these bodies of water relatively free of _______________.
   A. Eggs, larvae, and pupae   C. Mosquito larva
   B. Eggs                    D. None of the above

Wrigglers and Tumblers
6. The mosquitoes in the United States, all of which live in specific habitats, exhibit unique behaviors and bite different types of animals. Despite these differences, all mosquitoes share some common traits, such as _______________.
   A. A two-year life span       C. Prolific mosquito breeding sites
   B. A four-stage life cycle    D. None of the above
7. After the female mosquito obtains a blood meal, she lays her eggs directly on the surface of stagnant water, in a depression, or on the edge of a container where rainwater may collect and flood the eggs.
   A. True   B. False

8. All female mosquitoes lay their eggs directly on the water surface.
   A. True   B. False

9. Mosquitoes belonging to the genus Culex lay their ________________ in bunches or "rafts."
   A. Tumblers   C. Eggs
   B. Cocoon   D. None of the above

10. ________________ are ready to bite one to two days after adult emergence.
    A. Adults   C. Wrigglers
    B. Female mosquitoes   D. None of the above

11. All mosquitoes have only one generation per year.
    A. True   B. False

12. Adults may fly 500 to 1000 miles, but usually rest in grass, shrubbery, or other foliage close to the water breeding area.
    A. True   B. False

13. On Plants: Mansonia eggs are deposited on the underside, and sometimes on top of ____________.
    A. The water surface   C. The leaves of certain floating aquatic plants.
    B. Above the waterline   D. None of the above

Weather
14. Mosquito development and population dynamics are closely tied to weather. When and how much rain is received, wind speed and direction, maximum and minimum temperatures, and the total amount of heat energy accumulated are all critical to mosquito development.
    A. True   B. False

Water Source
15. The water (or lack thereof) in a habitat directly affects mosquito reproduction. All mosquitoes need standing water to complete their development.
    A. True   B. False

Topic 2 – Mosquito Identification Section
1. The black-tailed mosquito, Culiseta melanura, belongs to the family Culicidae. This species of mosquito is considered unusual because it overwinters as larvae while most mosquito species overwinter as ________________.
   A. Ergatoids   C. Either adults or eggs
   B. Pupas   D. None of the above

2. Culiseta melanura larvae have long siphons that cannot be distinguished from those of other mosquito larvae.
   A. True   B. False
3. Anopheles quadrimaculatus is historically the most important vector of _____________ in the eastern United States.
   A. SLE    C. WNV
   B. Malaria  D. None of the above

4. Culex pipiens, the Northern House Mosquito has a distribution that roughly includes the _______________ of the United States.
   A. Treeholes    C. Northern half
   B. Southern parts  D. None of the above

5. Culex pipiens species is ___________________ around the abdominal segments. The quickly developing larvae may be continuously present spring through fall.
   A. Bluntly colored    C. Medium-sized, brownish with pale bands
   B. Red and white  D. None of the above

6. Culex pipiens can be found in a fairly small range of larval habitats, but are generally associated with water that has a low organic content.
   A. True    B. False

7. Culex pipiens is a serious pest, called the "house mosquito" because it commonly develops in small containers around the home. It shows great skill in finding ways to get into the house, where it feeds on _______________. It also occurs in containers and sumps on farms and industrial plants, in polluted waters, and will feed out-of-doors at night.
   A. Birds    C. The occupants at night
   B. Dogs  D. None of the above

8. Culex tarsalis breeds in nearly every freshwater source except _______________. Larvae are found in all but the most polluted ground pools.
   A. Treeholes    C. Effluent from sewage treatment plants
   B. Running water  D. None of the above

9. Culex tarsalis is the most important carrier of ________________ in much of the western U.S.
   A. WEE    C. Western equine and Saint Louis encephalitis
   B. Malaria  D. None of the above

10. Mosquitoes of the Culex tarsalis species have a ___________________.
    A. Bluntly rounded abdominal tip    C. Brownish strip with pale bands
    B. Distinct ring around the proboscis  D. None of the above

11. Western Encephalitis Mosquito (Culex tarsalis) is medium-sized, dark mosquito that has a broad white band across the middle of the proboscis and the lower leg segments. In addition to being a potential vector of ________________ this species is the most important vector of Western Equine encephalitis (WEE) and SLE.
    A. SLE    C. WNV
    B. WEE  D. None of the above
12. As mosquitoes go, the Western Encephalitis Mosquito is one of the more easily recognizable, with its ______________.
   A. Distinctive scale patterns  C. High pitched buzz
   B. Distinct ring around the proboscis  D. None of the above

13. The legs have white banding on each side of the joints, and the proboscis is adorned with a ______________.
   A. Bluntly rounded abdominal tip  C. Brownish pale band
   B. Bright white band of scales in the middle  D. None of the above

14. Species in the genus Culex are known as “Dampwood” mosquitoes.
   A. True  B. False

15. Woodland Malaria mosquitoes have four life stages: egg, larva, pupa, and adult. The immature stages need standing water to complete their life cycle.
   A. True  B. False

**Topic 3– Mosquito-Borne Diseases Section**

1. Zika disease can be passed from a pregnant woman to her fetus. Infection during pregnancy can cause certain birth defects.
   A. True  B. False

2. Encephalitis is ________________, and serious disease carried by mosquitoes. Its symptoms are severe headache, fever, vomiting, disorientation, chills, muscle aches and pains. It usually occurs in warm wet weather.
   A. A birth defect  C. An untreatable, sometimes deadly
   B. Fever and joint pain  D. None of the above

3. ________________ is caused by viruses that are carried by mosquitoes. Symptoms appear three to six days after the person is bit by a mosquito. Dengue fever is mostly found in the tropics.
   A. EEE virus  C. Dengue fever
   B. Dog heartworm  D. None of the above

4. ________________ is spread to people by the bite of an infected mosquito. The most common symptoms of infection are fever and joint pain.
   A. LAC virus  C. Usual cycle of transmission
   B. Chikungunya virus  D. None of the above

5. ________________ usually doesn’t cause death, but the symptoms can be severe and debilitating.
   A. EEE virus  C. Chikungunya
   B. Dog heartworm  D. None of the above

6. If a fully engorged mosquito with ________________ positive blood is squashed on the skin, there would be insufficient transfer of virus to produce infection.
   A. LAC virus  C. Usual cycle of transmission
   B. HIV  D. None of the above
Canine Heartworm
7. _________________ is a Bunyavirus and is a zoonotic pathogen cycled between the
daytime-biting treehole mosquito, Aedes triseriatus, and vertebrate amplifier hosts
(chipmunks, tree squirrels) in deciduous forest habitats.
A. LAC virus C. Brokebone fever
B. Beaver fever D. None of the above

8. _________________ is maintained over the winter by transovarial transmission in
mosquito eggs. If the female mosquito is infected, she may lay eggs that carry the virus, and
the adults coming from those eggs may be able to transmit the virus to chipmunks and to
humans.
A. LAC virus C. Brokeback fever
B. EEE virus D. None of the above

9. _________________ is also caused by a virus transmitted to humans and equines by the
bite of an infected mosquito.
A. LAC virus C. Brokebone fever
B. Eastern equine encephalitis (EEE) D. None of the above

10. _________________ is an alphavirus that was first identified in the 1930's and
currently occurs in focal locations along the eastern seaboard, the Gulf Coast and some
inland Midwestern locations of the United States.
A. EEE virus C. Beaver fever
B. Dog heartworm D. None of the above

11. _________________ occurs in natural cycles involving birds and Culiseta melanura, in
some swampy areas nearly every year during the warm months.
A. LAC virus C. Brokebone fever
B. EEE virus D. None of the above

12. Where _________________ resides or how it survives in the winter is unknown. It
may be introduced by migratory birds in the spring or it may remain dormant in some yet
undiscovered part of its life cycle.
A. EEE virus C. Beaver fever
B. Dog heartworm D. None of the above

13. In this usual cycle of transmission, virus does not escape from these areas because the
mosquito involved prefers to feed upon birds and does not usually bite humans or other
mammals.
A. True B. False

14. For reasons not fully understood, the virus may escape from enzootic foci in swamp
areas in birds or bridge vectors such as Coquilletidida perturbans and Aedes sollicitans.
These species feed on both birds and mammals and can transmit the virus to humans,
horses, and other hosts.
A. True B. False
15. Other mosquito species such as Ae. vexans and Culex nigripalpus can also transmit ________________. When health officials maintain surveillance for EEE virus activity, this movement out of the swamp can be detected, and if the level of activity is sufficiently high, can recommend and undertake measures to reduce the risk to humans.
A. EEE virus
B. Dog heartworm
C. Beaver fever
D. None of the above

**Topic 4– Mosquito Control Section**

1. ________________ are applied directly to water using backpack sprayers and truck or aircraft-mounted sprayers.
A. DDT
B. Liquid larvicide products
C. Insect growth inhibitor methoprene
D. None of the above

2. Homeowners may apply ____________ (made with Bacillus thuringiensis Berliner var. israelensis or B.t.i.) to kill mosquito larvae in the water. This natural ingredient is harmless to other living things and is biodegradable.
A. Mosquito Dunks
B. Golden Bear 1111
C. DDT and Chlordane
D. None of the above

3. ________________ and other materials form a thin film on the surface of the water, which cause larvae and pupae to drown.
A. Mineral oils
B. Mosquito Dunks
C. Altosid XR Briquettes
D. None of the above

4. Chlorinated hydrocarbons like DDT and Chlordane are very much a thing of the past, as are the use of ________________.
A. Mosquito Dunks
B. Golden Bear 1111
C. Organophosphate and carbamate insecticides
D. None of the above

5. ________________ is another safe material for control of mosquito larvae. It is an insect hormone that retards the development of larvae (disrupts molting) and prevents mosquitoes from developing into adults.
A. Methoprene (Altosid XR)
B. Liquid larvicide products
C. An adulticide
D. None of the above

6. ________________ can be placed even on ice for season-long control. Treat swamps, ponds, and marsh areas in early spring before thawing. These extended-release briquettes will provide up to 150 days of uninterrupted mosquito control once they hit the water.
A. Mineral oils
B. DDT and Chlordane
C. Altosid XR Briquettes
D. None of the above

7. ________________ can be applied by hand and the product is labeled for use in known fish habitats.
A. Altosid XR Briquettes
B. Oxygen
C. An adulticide
D. None of the above

**Microbial Insecticides**

8. Bti strains are sold under the names Bactimos, Teknar and Vectobac.
A. True
B. False
9. _______________ is an insect growth regulator widely used by abatement districts to control mosquito larvae.
   A. Methoprene (sold under the name Altosid)  C. An adulticide
   B. Liquid larvicide products  D. None of the above

10. _______________ mimics a natural juvenile hormone, and when present in the larval habitat, it keeps immature insects from maturing into adults. Unable to metamorphose, the mosquitoes die in the pupal stage.
   A. Methoprene  C. Bti (Bacillus thuringiensis israelensis)
   B. Liquid larvicide products  D. None of the above

11. State and local agencies commonly use the organophosphate insecticides Malathion and Naled and the synthetic pyrethroid insecticides ____________ for adult mosquito control. Always follow the pesticide label’s instructions.
   A. Malathion and Naled  C. Permethrin, Resmethrin, and Sumithrin
   B. Malathion  D. None of the above

12. _______________ is a pesticide that is widely used in agriculture, residential landscaping, public recreation areas, and in public health pest control programs such as mosquito eradication. In the US, it is the most commonly used organophosphate insecticide.
   A. Synergized pyrethrins 0.1%  C. Organophosphate insecticide
   B. Malathion  D. None of the above

13. _______________ is applied as an ultra-low volume (ULV) spray. ULV sprayers disperse very fine aerosol droplets that stay aloft and kill mosquitoes on contact.
   A. Synergized pyrethrins 0.1%  C. Organophosphate insecticide
   B. Malathion  D. None of the above

14. ULV applications involve small quantities of pesticide active ingredient in relation to the size of the area treated.
   A. True  B. False

15. Naled is _______________ used to kill adult mosquitoes. In mosquito control programs conducted by state or local authorities, Naled is applied by truck-mounted or aircraft-mounted sprayers.
   A. An adulticide  C. Malathion
   B. Spray  D. None of the above

**Topic 5- Insects Commonly Mistaken for Mosquitoes**

1. When humans come in contact with _______________infested vegetation, the larvae swarm over the entire body and it might be several hours before they settle down to feed.
   A. Bedbugs  C. Chiggers
   B. Dixid Midge larvae  D. None of the above

2. Dance Flies appear like _______________ by the way they swarm in sunlit areas in backyards and other sheltered situations. The vertical movement of the swarming adults gives them their common name of Dance Flies.
   A. Mosquitoes  C. Crane flies
   B. Dixid Midge larvae  D. None of the above
3. ____________________ are common around moist areas where vegetation is abundant and may be seen swarming at dusk along the edges of streams and lakes. The adults are short lived, usually being active less than a week.
A. Redbugs C. Dance Flies
B. Dixid Midges D. None of the above

4. ____________________ do not fly, but have strong hind legs which they use to jump from host to host. Dogs and cats are at risk of getting these creatures.
A. Redbugs C. Dance Flies
B. Fleas D. None of the above

5. In the U.S., the most common flea species carried by both cats and dogs is the_______________.
A. Dog flea C. Cat flea, Ctenocephalides felis
B. Red flea D. None of the above

6. Compared with other flea species, the ______________ has a very wide host range. Wild animals carrying cat fleas include raccoons, opossum, skunks and foxes.
A. Dog flea C. Cat flea
B. Red flea D. None of the above

7. Mayflies (Ephemeroptera) can be quite abundant near creeks, flood control channels and other water sources throughout the United States. Their larvae are found in most aquatic habitats and can live in____________________.
A. Land breeding site habitats C. Moving water
B. Host to host D. None of the above

8. Adult mayflies though not even closely resembling mosquitoes, their seasonal occurrence at porch lights and on the walls of buildings near their _______________invariably attracts the attention of some concerned residents.
A. Land breeding site C. Aquatic breeding sources
B. Host sources D. None of the above

9. The nymphs of mayflies develop in _____________ where they form an important part of the food chain. Adults are among the shortest lived in the insect world.
A. Sewage C. Public health importance
B. All types of aquatic habitats D. None of the above

10. ____________________ are of considerable public health importance because of their ability to transmit several viral, bacterial, and protozoal disease-causing organisms of humans and other animals.
A. Crane Flies C. Phlebotomine sand flies
B. Owl Midges D. None of the above

11. The ____________________ males and females feed on nectar and other plant juices, but females require a blood meal in order to mature a second batch of eggs. The blood meal hosts include white-tailed deer, horses, donkeys, mules, cattle, swine, raccoons, rodents, birds and humans.
A. Crane Flies C. Phlebotomine sand flies
B. Owl Midges D. None of the above
12. ___________________ (Trichoceridae) are often quite abundant during winter and spring. They so closely resemble mosquitoes that they are frequently mistaken for them.
   A. Winter Crane Flies   C. Phlebotomine sand flies
   B. Summer crane flies   D. None of the above

13. ___________________ larvae are found in roots, fungi, decaying vegetation, rotting leaves, manure, and other vegetative material. The adults are readily attracted to lights.
   A. Winter Crane Flies   C. Summer crane flies
   B. Owl Midges           D. None of the above

14. ___________________ do not bite humans, and they don’t carry disease. But these species still can be annoying to homeowners.
   A. Summer crane flies   C. Mosquitoes
   B. Winter Crane Flies   D. None of the above

15. ___________________ (Anisopodidae) are some of the better known gnats, for they are attracted to light and can be found near windows, especially in spring time. The adults can be found all year long, though.
   A. Ticks               C. Wood Gnats
   B. Midges              D. None of the above
**Mosquito Control CEU Training Awareness Assignment #6**  
**For Repeat Students**

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.

**Topic 1 – Mosquito Introduction Section**  
**Integrated Pest Management -Introduction**

1. _______________ is a critical component to any successful IPM program because the results from the surveillance will help determine the appropriate response to an infestation.
   A. Pests and vectors  
   B. Pest prevention  
   C. Surveillance  
   D. None of the above

2. Extensive infestations or those where______________, merit a different response than will lower levels of infestations.
   A. Disease is present  
   B. Pest prevention  
   C. Surveillance  
   D. None of the above

**Mosquito Life Cycle Section**

3. The type of standing water in which the mosquito chooses to lay her _____________depends upon the species.
   A. Eggs, larvae, and pupae  
   B. Eggs  
   C. Mosquito larva  
   D. None of the above

4. The presence of beneficial predators such as fish and dragonfly nymphs in permanent ponds, lakes, and streams usually keep these bodies of water relatively free of _____________.
   A. Eggs, larvae, and pupae  
   B. Nest  
   C. Mosquito larva  
   D. None of the above

5. Portions of marshes, swamps, clogged ditches, and temporary pools and puddles are all prolific mosquito breeding sites. Other sites in which some species lay their _____________ include tree holes and containers such as old tires, buckets, toys, potted plant trays, and saucers and plastic covers or tarpaulins.
   A. Eggs, larvae, and pupae  
   B. Eggs  
   C. Mosquito larva  
   D. None of the above

6. The mosquito goes through four distinct stages during its life cycle.
   A. True  
   B. False

**Wrigglers and Tumblers**

7. Mosquitoes may overwinter as eggs, and as _________________.
   A. Fertilized adult females or larvae  
   B. Ergatoids  
   C. Wrigglers  
   D. None of the above
8. Eggs, larvae, and pupae must have water to develop.
   A. True     B. False

9. ____________________ are ready to bite one to two days after adult emergence.
   A. Ergatoids    C. Wrigglers
   B. Female mosquitoes    D. None of the above

**Mosquito Egg Classification**

10. Each mosquito species prefers certain localities for depositing eggs. Some prefer very clean water, others slightly polluted water, while others thrive in ____________.
    A. On the water surface    C. Decomposing leaf litter
    B. Extremely polluted water    D. None of the above

11. Single On Water: Anopheles and Toxorhynchites lay their eggs one at a time on ____________.
    A. The water surface    C. The leaves of certain floating aquatic plants.
    B. Above the waterline    D. None of the above

12. Single in Soil: most Aedes and Psorophora lay their eggs one at a time on a moist substrate, such as ____________.
    A. Decomposing leaf litter    C. Mud and decomposing leaf litter
    B. Extremely polluted water    D. None of the above

13. Single On Cavity Walls: Wyeomyia, Orthopodomyia, and certain Aedes deposit eggs in tree holes, water-holding plants, or artificial containers. The eggs are placed ____________.
    A. The water surface    C. The leaves of certain floating aquatic plants.
    B. Above the waterline    D. None of the above

14. Rafts On Water: Most Culex, Culiseta, Coquillettidia, and Uranotaenia lay eggs in masses, called rafts or boats, ____________.
    A. Population dynamics    C. On the water surface
    B. Decomposing leaf litter    D. None of the above

15. On Plants: Mansonia eggs are deposited on the underside, and sometimes on top of ____________.
    A. The water surface    C. The leaves of certain floating aquatic plants.
    B. Above the waterline    D. None of the above

**Topic 2 – Mosquito Identification Section**

1. The ____________ of most mosquito species have a siphon (breathing tube) for acquiring air from just above the surface of water while submerged.
   A. Pupas    C. Larvae
   B. Eggs    D. None of the above

2. Culiseta melanura is a medium-sized mosquito that resembles Culex species because of its ____________.
   A. Bluntly rounded abdominal tip    C. Brownish color with pale bands
   B. Its distinctive scale patterns    D. None of the above
3. *Anopheles quadrimaculatus* is historically the most important vector of ______________ in the eastern United States.
   A. SLA  C. WNV
   B. Malaria  D. None of the above

4. *Culex pipiens* species is _______________ around the abdominal segments. The quickly developing larvae may be continuously present spring through fall.
   A. Bluntly colored  C. Medium-sized, brownish with pale bands
   B. Distinct ring around the proboscis  D. None of the above

5. *Culex pipiens* are known to vector ________________
   A. SLE  C. WNV
   B. WEE  D. None of the above

6. Catch basins and storm drains provide ideal habitat for *Cx. pipiens*. The species becomes particularly abundant in areas where raw sewage leaks into ________________
   A. Treeholes  C. Effluent from sewage treatment plants
   B. Subterranean drainage systems  D. None of the above

7. Meat packing plants and slaughter house drainage ponds support high populations of this species. *Culex pipiens* can always be collected in the ________________.
   A. Treeholes  C. Effluent from sewage treatment plants
   B. Temporary ground water  D. None of the above

8. *Culex pipiens*’ main host is wild birds, but it also feeds freely on a wide variety of warm-blooded vertebrates, including man.
   A. True  B. False

9. *Culex tarsalis* breeds in nearly every freshwater source except ________________.
   Larvae are found in all but the most polluted ground pools.
   A. Treeholes  C. Effluent from sewage treatment plants
   B. Out-of-doors at night  D. None of the above

10. *Culex tarsalis* is the most important carrier of ________________ in much of the western U.S.
    A. WEE  C. Western equine and Saint Louis encephalitis
    B. Malaria  D. None of the above

11. Mosquitoes of the *Culex tarsalis* species have a ________________
    A. Bluntly rounded abdominal tip  C. Brownish strip with pale bands
    B. Distinct ring around the proboscis  D. None of the above

12. *Western Encephalitis Mosquito* (*Culex tarsalis*) is medium-sized, dark mosquito that has a broad white band across the middle of the proboscis and the lower leg segments. In addition to being a potential vector of ________________ this species is the most important vector of Western Equine encephalitis (WEE) and SLE.
    A. WLE  C. WNV
    B. WEE  D. None of the above
13. As mosquitoes go, the Western Encephalitis Mosquito is one of the more easily recognizable, with its
A. Bluntly rounded abdominal tip  C. Brownish hair with pale bands
B. Distinctive scale patterns   D. None of the above

14. The legs have white banding on each side of the joints, and the proboscis is adorned with a
A. Distinctive scale patterns   C. Bright white band of scales in the middle
B. Distinct ring around the proboscis D. None of the above

15. Species in the genus Culex are known as “standing-water” mosquitoes.
A. True   B. False

Topic 3– Mosquito-Borne Diseases Section

1. Zika disease is spread mostly by the bite of an infected Aedes species mosquito (Ae. aegypti and Ae. albopictus). These mosquitoes bite
A. Birds as blood meal hosts  C. During the day and night
B. Infected dogs  D. None of the above

2. Encephalitis is a virus of the central nervous system that is passed from infected birds to humans by mosquitoes that accept
A. Birds as blood meal hosts  C. Day and night feedings
B. Nectar  D. None of the above

3. is a dangerous parasitic disease common in tropical and subtropical areas. It is transmitted by the female Anopheles mosquito.
A. PEE virus  C. Malaria
B. Dog heartworm  D. None of the above

4. is caused by viruses that are carried by mosquitoes. Symptoms appear three to six days after the person is bit by a mosquito. Dengue fever is mostly found in the tropics.
A. EEE virus  C. Dengue fever
B. Dog heartworm  D. None of the above

5. is spread to people by the bite of an infected mosquito. The most common symptoms of infection are fever and joint pain.
A. EEE virus  C. Chikungunya virus
B. Dog heartworm  D. None of the above

6. usually doesn’t cause death, but the symptoms can be severe and debilitating.
A. DEE virus  C. Chikungunya
B. Cat heartworm  D. None of the above

7. If a fully engorged mosquito with positive blood is squashed on the skin, there would be insufficient transfer of virus to produce infection.
A. LAC virus  C. HIV
B. Dog heartworm  D. None of the above
Canine Heartworm
8. Adult heartworms live in a dog’s heart, but young forms of the worm are found in their blood. Mosquitoes transmit the infection when they feed on the blood of an infected dog.
A. True B. False

9. Dog heartworm is a large filarial worm that lives in the heart of dogs, but produces a blood stage small enough to develop in a mosquito.
A. True B. False

10. _________________ is also caused by a virus transmitted to humans and equines by the bite of an infected mosquito.
   A. LAC virus C. Brokebone fever
   B. Eastern equine encephalitis (EEE) D. None of the above

11. _________________ is an alphavirus that was first identified in the 1930's and currently occurs in focal locations along the eastern seaboard, the Gulf Coast and some inland Midwestern locations of the United States.
   A. FEE virus C. Beaver fever
   B. EEE virus D. None of the above

12. _________________ occurs in natural cycles involving birds and Culiseta melanura, in some swampy areas nearly every year during the warm months.
   A. EEE virus C. Beaver fever
   B. Dog heartworm D. None of the above

13. Where _________________ resides or how it survives in the winter is unknown. It may be introduced by migratory birds in the spring or it may remain dormant in some yet undiscovered part of its life cycle.
   A. LAC virus C. Brokeback fever
   B. EEE virus D. None of the above

14. For reasons not fully understood, the virus may escape from enzootic foci in swamp areas in birds or bridge vectors such as Coquillettidia perturbans and Aedes sollicitans. These species feed on both birds and mammals and can transmit the virus to humans, horses, and other hosts.
   A. True B. False

15. Other mosquito species such as Ae. vexans and Culex nigripalpus can also transmit _________________. When health officials maintain surveillance for EEE virus activity, this movement out of the swamp can be detected, and if the level of activity is sufficiently high, can recommend and undertake measures to reduce the risk to humans.
   A. LAC virus C. Brokebone fever
   B. EEE virus D. None of the above
**Topic 4—Mosquito Control Section**

1. ____________ include the bacterial insecticides *Bacillus thuringiensis israelensis* and *Bacillus sphaericus*, the insect growth inhibitor methoprene, and the organophosphate insecticide temephos.
   - A. ULV application
   - B. Larvicides
   - C. Naled .50 percent formulation
   - D. None of the above

2. ____________ is another safe material for control of mosquito larvae. It is an insect hormone that retards the development of larvae (disrupts molting) and prevents mosquitoes from developing into adults.
   - A. ULV application
   - B. Methoprene (Altosid XR)
   - C. Tablet, pellet, granular, and briquette formulations
   - D. None of the above

3. ____________ can be placed even on ice for season-long control. Treat swamps, ponds, and marsh areas in early spring before thawing. These extended-release briquettes will provide up to 150 days of uninterrupted mosquito control once they hit the water.
   - A. Mineral oils
   - B. DDT and Chlordane
   - C. Altosid XR Briquettes
   - D. None of the above

4. ____________ can be applied by hand and the product is labeled for use in known fish habitats.
   - A. Altosid XR Briquettes
   - B. Naled .50 percent formulation
   - C. ULV application
   - D. None of the above

**Microbial Insecticides**

5. ____________ is an insect growth regulator widely used by abatement districts to control mosquito larvae.
   - A. ULV application
   - B. Oxygen
   - C. Methoprene (sold under the name Altosid)
   - D. None of the above

6. ____________ mimics a natural juvenile hormone, and when present in the larval habitat, it keeps immature insects from maturing into adults. Unable to metamorphose, the mosquitoes die in the pupal stage.
   - A. Methoprene
   - B. Liquid products
   - C. ULV application
   - D. None of the above

7. Vector control technicians sometimes use ____________ to reach larval sources that would otherwise be difficult or dangerous to treat.
   - A. Methoprene
   - B. Liquid products
   - C. Naled .50 percent formulation
   - D. None of the above

8. Space sprays or aerosol "bombs," containing ____________, are effective against adult mosquitoes. Frequent treatments may be needed during problem periods.
   - A. Malathion and Naled
   - B. Synergized pyrethrins 0.1%
   - C. ULV application
   - D. None of the above
9. ____________________, typically applied as high volume (low concentration) liquids with hand-held spray equipment using compounds with residual characteristics, are common in some U.S. locations and their use is growing.
   A. An adulticide  C. Barrier treatments
   B. Naled  D. None of the above

10. ________________ is an organophosphate parasympathomimetic which binds irreversibly to cholinesterase.
    A. Synergized pyrethrins 0.1%  C. Organophosphate insecticide
    B. Malathion  D. None of the above

11. ____________________ is an insecticide of relatively low human toxicity; however recent studies have shown that children with higher levels of malathion in their urine seem to be at an increased risk of attention deficit hyperactivity disorder.
    A. An adulticide  C. Malathion
    B. Naled  D. None of the above

12. ________________ is a pesticide that is widely used in agriculture, residential landscaping, public recreation areas, and in public health pest control programs such as mosquito eradication. In the US, it is the most commonly used organophosphate insecticide.
    A. Synergized pyrethrins 0.1%  C. Naled .50 percent formulation
    B. Malathion  D. None of the above

13. The mosquito goes through four distinct stages during its life cycle: egg, larva, pupa, and adult. Malathion is an adulticide, used to kill adult mosquitoes.
    A. True  B. False

14. ________________ is applied as an ultra-low volume (ULV) spray. ULV sprayers dispense very fine aerosol droplets that stay aloft and kill mosquitoes on contact.
    A. Naled  C. An organophosphate parasympathomimetic
    B. Malathion  D. None of the above

15. Naled is an ________________ that has been registered since 1959 for use in the United States. It is used primarily for controlling adult mosquitoes, but Naled is also used on food and feed crops, and in greenhouses.
    A. Synergized pyrethrins 0.1%  C. Organophosphate insecticide
    B. Treatment  D. None of the above

**Topic 5- Insects Commonly Mistaken for Mosquitoes**

1. ____________________ are long, gangly insects that commonly resemble mosquitoes with their slender, jointed legs and elongated thorax.
   A. Mosquitoes  C. Crane flies
   B. Dixid Midge larvae  D. None of the above

2. ____________________ do not bite, and contrary to popular belief, they do not eat mosquitoes. Some species of crane flies emerge from aquatic sources and others from terrestrial or decaying vegetation sources.
   A. Cat flea  C. Mosquitoes
   B. Crane flies  D. None of the above
3. Larvae of chiggers, commonly called ________________, attack humans and dogs during the larval stage.
   A. Redbugs        C. Dance Flies
   B. Dixid Midge larvae         D. None of the above

4. When humans come in contact with ________________infested vegetation, the larvae swarm over the entire body and it might be several hours before they settle down to feed.
   A. Redbugs        C. Chiggers
   B. Dixid Midge larvae         D. None of the above

5. Dance Flies appear like ________________ by the way they swarm in sunlit areas in backyards and other sheltered situations. The vertical movement of the swarming adults gives them their common name of Dance Flies.
   A. Mosquitoes        C. Crane flies
   B. Dixid Midge larvae         D. None of the above

6. Cat fleas are small (about ¼ inch long), black flies commonly found around decaying vegetation. They have large wings and long antennae, but they are weak flyers and do not move far from the breeding site.
   A. True        B. False

7. Adult mayflies though not even closely resembling mosquitoes, their seasonal occurrence at porch lights and on the walls of buildings near their ________________invariably attracts the attention of some concerned residents.
   A. Land breeding site        C. Aquatic breeding sources
   B. Host sources         D. None of the above

8. The nymphs of mayflies develop in ________________ where they form an important part of the food chain. Adults are among the shortest lived in the insect world.
   A. Flowing sap        C. Winter and spring
   B. All types of aquatic habitats         D. None of the above

9. ________________ (Psychodidae) are small hairy flies that can move about very nimbly, but are weak fliers.
   A. Crane flies        C. Phlebotomine sand flies
   B. Owl Midges         D. None of the above

10. ________________ are of considerable public health importance because of their ability to transmit several viral, bacterial, and protozoal disease-causing organisms of humans and other animals.
    A. Winter Crane Flies        C. Phlebotomine sand flies
    B. Owl Midges         D. None of the above

11. ________________ (Trichoceridae) are often quite abundant during winter and spring. They so closely resemble mosquitoes that they are frequently mistaken for them.
    A. Winter Crane Flies        C. Phlebotomine sand flies
    B. Owl Midges         D. None of the above
12. _________________ larvae are found in roots, fungi, decaying vegetation, rotting leaves, manure, and other vegetative material. The adults are readily attracted to lights.
A. Crane flies   C. Winter Crane Flies
B. Owl Midges   D. None of the above

13. ________________________ do not bite humans, and they don’t carry disease. But these species still can be annoying to homeowners.
A. Crane flies   C. Mosquitoes
B. Winter Crane Flies   D. None of the above

14. _________________ (Anisopodidae) are some of the better known gnats, for they are attracted to light and can be found near windows, especially in spring time. The adults can be found all year long, though.
A. Winter Crane Flies   C. Wood Gnats
B. Owl Midges   D. None of the above

15. _________________ adults are found on foliage in or near damp places, some are found around flowing sap. They are sometimes seen in small swarms. Adults appear in two variations: grayish black or reddish.
A. Winter Crane Flies   C. Wood Gnats
B. Owl Midges   D. None of the above