

Registration form

**pH Fundamentals CEU Training Course \$50.00
48 HOUR RUSH ORDER PROCESSING FEE ADDITIONAL \$20.00**

Start and finish dates: _____

You will have 90 days from this date in order to complete this course

List number of hours worked on assignment must match State requirement. _____

Name _____ **Signature** _____

I have read and understood the disclaimer notice on page 2. Digitally sign XXX

Address: _____

City _____ **State** _____ **Zip** _____

Email _____ **Fax (____)** _____

Phone:
Home (____) _____ **Work (____)** _____

Operator ID # _____ **Exp. Date** _____

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

Wastewater Collection _____ Wastewater Treatment _____ Distribution _____

Water Treatment _____ Other _____

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

If you've paid on the Internet, please write your Customer# _____

Please invoice me, my PO# _____

Please pay with your credit card on our website under Bookstore or Buy Now. Or call us and provide your credit card information.

DISCLAIMER NOTICE

I understand that it is my responsibility to ensure that this CEU course is either approved or accepted in my State for CEU credit. I understand State laws and rules change on a frequent basis and I believe this course is currently accepted in my State for CEU or contact hour credit, if it is not, I will not hold Technical Learning College responsible. I also understand that this type of study program deals with dangerous conditions and that I will not hold Technical Learning College, Technical Learning Consultants, Inc. (TLC) liable for any errors or omissions or advice contained in this CEU education training course or for any violation or injury caused by this CEU education training course material. I will call or contact TLC if I need help or assistance and double-check to ensure my registration page and assignment has been received and graded.

You can obtain a printed version of the course manual from TLC for an additional \$79.95 plus shipping charges.

AFFIDAVIT OF EXAM COMPLETION

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

Grading Information

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

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

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

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

All downloads are electronically tracked and monitored for security purposes.

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.

pH Fundamentals Answer Key

Name _____

Phone _____

You are solely responsible in ensuring 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 _____

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

What is 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.

You can use Adobe Acrobat DC Program to complete the assignment.

Please circle, underline, bold or X only one correct answer.

A felt tipped pen works best for marking the answers.

- | | |
|-------------|-------------|
| 1. A B C D | 16. A B C D |
| 2. A B | 17. A B C D |
| 3. A B | 18. A B C D |
| 4. A B C D | 19. A B C D |
| 5. A B C D | 20. A B C D |
| 6. A B C D | 21. A B C D |
| 7. A B C D | 22. A B C D |
| 8. A B C D | 23. A B C D |
| 9. A B C D | 24. A B C D |
| 10. A B C D | 25. A B C D |
| 11. A B C D | |
| 12. A B C D | |
| 13. A B C D | |
| 14. A B | |
| 15. A B C D | |

**Please fax the answer key to TLC
(928) 272-0747**

Rush Grading Service

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

pH FUNDAMENTALS CEU TRAINING COURSE

CUSTOMER SERVICE RESPONSE CARD

NAME: _____

E-MAIL _____ PHONE _____

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

1. Please rate the difficulty of your course.

Very Easy 0 1 2 3 4 5 Very Difficult

2. Please rate the difficulty of the testing process.

Very Easy 0 1 2 3 4 5 Very Difficult

3. Please rate the subject matter on the exam to your actual field or work.

Very Similar 0 1 2 3 4 5 Very Different

4. How did you hear about this Course? _____

5. What would you do to improve the Course?

How about the price of the course?

Poor _____ Fair _____ Average _____ Good _____ Great _____

How was your customer service?

Poor _____ Fair _____ Average _____ Good _____ Great _____

Any other concerns or comments.

pH Fundamentals CEU Training Course Assignment

The Assignment (Exam) is also available in Word on the Internet for your Convenience, please visit www.ABCTLC.com and download the assignment and e-mail it back to TLC.

You will have 90 days from the start of this course to complete in order to receive your Professional Development Hours (**PDHs**) or Continuing Education Unit (**CEU**). A score of 70 % is necessary to pass this course. We prefer if this exam is proctored. No intentional trick questions. If you should need any assistance, please email all concerns and the completed manual to info@tlch2o.com.

We would prefer that you utilize the enclosed answer sheet in the front, but if you are unable to do so, type out your own answer key. Please include your name and address on your Answer Key and make copy for yourself. You can e-mail or fax your Answer Key along with the Registration Form to TLC. **(S) Means answer may be plural or singular. Multiple Choice Section, One answer per question and please use the answer key.**

Please write down any questions you are unable to find or has a poor answer.

1. When an atom loses _____ and thus has more protons than electrons, the atom is a positively-charged ion or cation.
A. A proton C. An electron
B. Charge D. None of the Above
2. Measurement of pH for aqueous solutions can be done with a glass electrode and a pH meter, or using indicators like strip test paper.
A. True B. False
3. In chemistry, pH is a measure of the acidity or basicity of an aqueous solution. Solutions with a pH greater than 7 are said to be acidic and solutions with a pH less than 7 are basic or alkaline.
A. True B. False
4. Pure water has a pH very close to?
A. 7 C. 7.7
B. 7.5 D. None of the Above
5. _____ are determined using a concentration cell with transference, by measuring the potential difference between a hydrogen electrode and a standard electrode such as the silver chloride electrode.
A. Primary pH standard values C. pH measurement(s)
B. Alkalinity D. None of the Above
6. Mathematically, pH is the negative logarithm of the activity of the (solvated) hydronium ion, more often expressed as the measure of the?
A. Electron concentration C. Hydronium ion concentration
B. Alkalinity concentration D. None of the Above
7. Which of the following terms for aqueous solutions can be done with a glass electrode and a pH meter, or using indicators?
A. Primary sampling C. Determining values
B. Measurement of pH D. None of the Above

8. The pH scale is logarithmic and therefore pH is?
 A. An universal indicator C. An excess of alkaline earth metal concentrations
 B. A dimensionless quantity D. None of the Above
9. Measuring alkalinity is important in determining a stream's ability to neutralize acidic pollution from rainfall or wastewater. It is one of the best measures of the sensitivity of the stream to acid inputs. There can be long-term changes in the _____ of rivers and streams in response to human disturbances.
 A. Acid C. pH measurement(s)
 B. Alkalinity D. None of the Above
10. pH is defined as the decimal logarithm of the reciprocal of the _____, a_{H^+} , in a solution.
 A. Hydrogen ion activity C. Brønsted–Lowry acid–base theory
 B. Acid-base behavior D. None of the Above
11. Which of the following terms may be used to measure pH, by making use of the fact that their color changes with pH?
 A. Indicators C. A set of non-linear simultaneous equations
 B. Spectrophotometer D. None of the Above
12. Alkalinity is the name given to the quantitative capacity of an aqueous solution to neutralize an?
 A. Acid C. Bond formation
 B. Base D. None of the Above
13. Which of the following terms of the color of a test solution with a standard color chart provides a means to measure pH accurate to the nearest whole number?
 A. Universal indicator C. Visual comparison
 B. Colorwheel measurement D. None of the Above
14. The pH scale is traceable to a set of standard solutions whose pH is established by US EPA.
 A. True B. False
15. The calculation of the pH of a solution containing acids and/or bases is an example of a chemical speciation calculation, that is, a mathematical procedure for calculating the concentrations of all chemical species that are present in the solution. The complexity of the procedure depends on the?
 A. Nature of the solution C. Alkaline earth metal concentrations
 B. pH D. None of the Above
16. Under normal circumstances this means that the concentration of hydrogen ions in acidic solution can be taken to be equal to the concentration of the acid. The pH is then equal to minus the logarithm of?
 A. The concentration value C. A set of non-linear simultaneous equations
 B. The pH D. None of the Above
17. Alkalinity of water is its acid-neutralizing capacity. It is the sum of all the titratable bases. The measured value may vary significantly with the?
 A. End-point pH C. pH measurement(s)
 B. Alkalinity D. None of the Above

18. For strong acids and bases no calculations are necessary except in extreme situations. The pH of a solution containing a weak acid requires the solution of a quadratic equation. The pH of a solution containing a weak base may require the?

- A. Solution of a cubic equation
- B. Non-linear simultaneous equations
- C. Excess of alkaline earth metal concentrations
- D. None of the Above

19. Alkalinity is a measure of this missing term and can be interpreted in terms of specific substances only when the chemical composition of the sample is known.

- A. Universal indicator
- B. An aggregate property of water
- C. Excess of alkaline earth metal concentrations
- D. None of the Above

20. More precise measurements are possible if the color is measured spectrophotometrically, using a?

- A. Universal indicator
- B. Colorimeter or spectrophotometer
- C. Set of non-linear simultaneous equations
- D. None of the Above

21. For strong acids and bases no calculations are necessary except in extreme situations. The pH of a solution containing a weak acid requires?

- A. The concentration value
- B. The solution of a quadratic equation
- C. Excess of alkaline concentrations
- D. None of the Above

22. Alkalinity in excess of which term is significant in determining the suitability of water for irrigation?

- A. 8
- B. pH of 7
- C. Alkaline earth metal concentrations
- D. None of the Above

23. The calculation of the pH of a solution containing acids and/or bases is an example of a _____ calculation, that is, a mathematical procedure for calculating the concentrations of all chemical species that are present in the solution

- A. Chemical speciation
- B. Spectrophotometer
- C. Visual comparison
- D. None of the Above

24. Since pH is a logarithmic scale, a difference of one pH unit is equivalent to _____ difference in hydrogen ion concentration

- A. 1
- B. .1
- C. 10
- D. None of the Above

25. Which of the following terms measurements is used in the interpretation and control of water and wastewater treatment processes?

- A. Acid
- B. Alkalinity
- C. Hydrogen bond formation
- D. None of the Above