Registration form

Groundwater Protection CEU Training Course $100.00
48 HOUR RUSH ORDER PROCESSING FEE ADDITIONAL $50.00

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.
Water Treatment___ Water Distribution___ Onsite ___

Wastewater Treatment___ UST Owner ___ Other _____

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

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

State Approval Listing Link, check to see if your State accepts or has pre-approved this course. Not all States are listed. Not all courses are listed. If the course is not accepted for CEU credit, we will give you the course free if you ask your State to accept it for credit.

Professional Engineers; Most states will accept our courses for credit but we do not officially list the States or Agencies. Please check your State for approval.

State Approval Listing URL…
http://www.abctlc.com/downloads/PDF/CEU%20State%20Approvals.pdf

You can obtain a printed version of the course from TLC for an additional $149.95 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.

All downloads are electronically tracked and monitored for security purposes.

Texas Students Only

Acknowledgement of Notice of Potential Ineligibility for License

You are required to sign and return to TLC or your credit will not be reported.

Name: _____

Date of Birth: _____

Email Address: _____

By signing this form, I acknowledge that Technical Learning College notified me of the following:

- the potential ineligibility of an individual who has been convicted of an offense to be issued an occupational license by the Texas Commission on Environmental Quality (TCEQ) upon completion of the educational program;
- the current TCEQ Criminal Conviction Guidelines for Occupational Licensing, which describes the process by which the TCEQ's Executive Director determines whether a criminal conviction:
- renders a prospective applicant an unsuitable candidate for an occupational license;
- warrants the denial of a renewal application for an existing license; or
- warrants revocation or suspension of a license previously granted.
- the right to request a criminal history evaluation from the TCEQ under Texas Occupations Code Section 53.102; and
- that the TCEQ may consider an individual to have been convicted of an offense for the purpose of denying, suspending or revoking a license under circumstances described in Title 30 Texas Administrative Code Section 30.33.

Enrollee Signature: _____ Date: _____

Name of Training Provider/Organization: Technical Learning College

Contact Person: Melissa Durbin Role/Title: Dean

For Texas TCEQ Wastewater Licensed Operators

Wastewater/Collections Rule Changes

Rule Changes and Updates for Domestic Wastewater Systems
On Nov. 4, 2014, TCEQ commissioners adopted revisions to 30 Texas Administrative Code (TAC), Chapter 217, Design Criteria for Domestic Wastewater Systems, and "re-adopted" previously repealed rules in 30 TAC, Chapter 317, Design Criteria Prior to 2008.

Some of the changes to Chapter 217 include:

- Adding new definitions and clarifying existing definitions;
- Adding design criteria and approval requirements for rehabilitation of existing infrastructure;
- Adding design criteria for new technologies, including cloth filters and air lift pumps;
- Making changes to reflect modern practices, standards and trends;
- Modifying rule language to improve readability and enforceability; and
- Modifying the design organic loadings and flows for a new wastewater treatment facility.

SUBCHAPTER A: ADMINISTRATIVE REQUIREMENTS §§217.1 - 217.18
Effective December 4, 2015 §217.1. Applicability. (a) Applicability. (1) This chapter applies to the design, operation, and maintenance of: (A) domestic wastewater treatment facilities that are constructed with plans and specifications received and approved by the executive director after the effective date of the amendments to this chapter; (B) treatment units that are altered, constructed, or re-rated with plans and specifications received and approved by the executive director after the effective date of the amendments to this chapter; (C) collection systems that are constructed with plans and specifications received and approved by the executive director after the effective date of the amendments to this chapter; (D) collection system units that are altered, constructed, or re-rated with plans and specifications received and approved by the executive director after the effective date of the amendments to this chapter; (E) existing domestic wastewater treatment facilities that do not have a current Texas Pollutant Discharge Elimination System permit or a Texas Land Application Permit and are required to have an active wastewater permit; (F) existing wastewater treatment facilities and collection systems that never received approval for plans and specifications from the executive director; and (G) collection system rehabilitation projects covered in §217.56(c) and §217.69 of this title (relating to Trenchless Pipe Installation; and Maintenance, Inspection, and Rehabilitation of the Collection System). (2) Domestic wastewater treatment facilities, treatment units, collection systems, and collection system units with plans and specifications approved by the executive director that were received on or after August 28, 2008 and before the effective date of this chapter must comply with the rules in this chapter, as they existed immediately before the effective date of the amendments to this chapter.

The rules in Texas Commission on Environmental Quality Page 2 Chapter 217 - Design Criteria for Domestic Wastewater Systems effect immediately before the effective date of the amendments to this chapter are continued in effect for that purpose. (3) This chapter does not apply to: (A) the design, installation, operation, or maintenance of domestic wastewater treatment facilities, treatment units, collection systems, or collection system units with plans and specifications that were approved by the executive director on or before August 27, 2008, which are governed by Chapter 317 of this title (relating to Design Criteria Prior to 2008) or design

criteria that preceded Chapter 317 of this title; and (B) systems regulated by Chapter 285 of this title (relating to On-Site Sewage Facilities); or collection systems or wastewater treatment facilities that collect, transport, treat, or dispose of wastewater that does not have the characteristics of domestic wastewater, although the wastewater may contain domestic wastewater.
(b) The executive director may grant variances from new requirements added by the amendments of this chapter to a person who proposes to construct, alter, or re-rate a collection system or wastewater treatment facility if the plans and specifications for the project are submitted within 180 days after the date the amendments to this chapter are effective, provided the plans and specifications comply with the rules in effect immediately prior to the amendment.
Adopted November 4, 2015 Effective December 4, 2015

The link to the rules is available on the TCEQ website at
https://www.tceq.texas.gov/rules/indxpdf.html

For Texas Students Only….

Please sign and date this notice

Printed Name

_____

Signature Date

_____

CERTIFICATION OF COURSE PROCTOR

Technical Learning College requires that our students who takes a correspondence or home study program course must pass a proctored course reading, quiz and final examination. The proctor must complete and provide to the school a certification form approved by the commission for each examination administered by the proctor.

Instructions. When a student completes the course work, fill out the blanks in this section and provide the form to the proctor with the examination.

Name of Course:_____

Name of Licensee:_____

Instructions to Proctor. After an examination is administered, complete and return this certification and examination to the school in a sealed exam packet or in pdf format.

I certify that:

1. I am a disinterested third party in the administration of this examination. I am not related by blood, marriage or any other relationship to the licensee which would influence me from properly administering the examination.
2. The licensee showed me positive photo identification prior to completing the examination.
3. The enclosed examination was administered under my supervision on _____. The licensee received no assistance and had no access to books, notes or reference material.
4. I have not permitted the examination to be compromised, copied, or recorded in any way or by any method.
5. Provide an estimate of the amount of time the student took to complete the assignment.

Time to complete the entire course and final exam. _____

Notation of any problem or concerns:

Name and Telephone of Proctor (please print):

_____

_____

Signature of Proctor

Groundwater Protection CEU Course Answer Key

Name _____ ***Telephone #*** _____

You are solely responsible to ensure that your State will accept this course for credit. 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? _____

What is the course approval number, if applicable? _____

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

You can also fill this assignment out electronically in Adobe Acrobat DC

Please write down any questions that cannot be found or has problems
Please circle, underline, bold or X only one correct answer
A felt tipped pen works best.

1. A B C D	16. A B C D	31. A B C D	46. A B
2. A B C D	17. A B C D	32. A B	47. A B
3. A B	18. A B C D	33. A B	48. A B
4. A B	19. A B C D	34. A B C D	49. A B C D
5. A B C D	20. A B	35. A B C D	50. A B
6. A B C D	21. A B C D	36. A B C D	51. A B C D
7. A B C D	22. A B C D	37. A B C D	52. A B C D
8. A B	23. A B C D	38. A B C D	53. A B C D
9. A B C D	24. A B C D	39. A B	54. A B C D
10. A B C D	25. A B C D	40. A B C D	55. A B
11. A B C D	26. A B C D	41. A B C D	56. A B
12. A B	27. A B	42. A B C D	57. A B C D
13. A B C D	28. A B C D	43. A B C D	58. A B C D
14. A B C D	29. A B C D	44. A B C D	59. A B C D
15. A B	30. A B C D	45. A B C D	60. A B C D

61. A B	71. A B C D	81. A B C D	91. A B
62. A B C D	72. A B C D	82. A B	92. A B C D
63. A B C D	73. A B C D	83. A B C D	93. A B C D
64. A B	74. A B	84. A B C D	94. A B C D
65. A B C D	75. A B C D	85. A B C D	95. A B C D
66. A B C D	76. A B	86. A B	96. A B C D
67. A B C D	77. A B	87. A B	97. A B C D
68. A B	78. A B	88. A B	98. A B C D
69. A B C D	79. A B C D	89. A B	99. A B
70. A B	80. A B C D	90. A B	100. A B C D

I understand that I am 100 percent responsible to ensure that TLC receives the Assignment and Registration Key and that it is accepted for credit by my State or Providence. 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. There is no credit for partial assignment completion. My exam was proctored. 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. I will not hold TLC liable for any errors, injury, death or non-compliance with rules. I will abide with all federal and state rules and rules found on page 2.

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

_____

Signature

Please write down any questions you were not able to find the answers or that have errors.

Please e-mail or fax this survey along with your final exam

GROUNDWATER PROTECTION 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.

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

Please rate the subject matter on the exam to your actual field or work.
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When Finished with Your Assignment

REQUIRED DOCUMENTS
Please scan the **Registration Page, Answer Key, Survey and Driver's License** and email it to info@TLCH2O.com.

IPhone Scanning Instructions
If you are unable to scan, take a photo of these documents with your **iPhone** and send these photos to TLC, info@TLCH2O.com.

FAX
If you are unable to scan and email, please fax these to TLC, if you fax, call to confirm that we received your paperwork. **(928) 468-0675**

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…

Groundwater Protection CEU Course Assignment

The Groundwater Protection CEU Assignment is 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. 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 manual and make copy for yourself.

Multiple Choice, please select only one answer per question. There are no intentional trick questions. (s) Means the answer can be plural or singular tense.

1. Which of the following is controlled largely by its porosity, or the relative amount of open space present to hold water?
A. Water table
B. An aquifer's storage capacity
C. Cone of depression
D. None of the above

2. If the aquifer is sandwiched between layers of relatively impermeable materials, it is called?
A. Confined aquifer
B. Hydrologic cycle
C. Water table
D. None of the above

3. There are two kinds of aquifers: confined and unconfined.
A. True B. False

4. Confined aquifers are not sandwiched between layers of relatively impermeable materials, and their upper boundaries are generally closer to the surface of the land.
A. True B. False

5. Which of the following are frequently found at greater depths than unconfined aquifers?
A. Confined aquifer(s)
B. Aquifer(s)
C. Water table
D. None of the above

Does Groundwater Move?

6. Groundwater can move sideways as well as up or down. This movement is in response to gravity, differences in elevation, and?
A. Differences in pressure
B. Permeable zones
C. Vadose zones
D. None of the above

7. Groundwater can move even more rapidly in karst aquifers, which are areas in which missing term and similar rocks where fractures or cracks have been widened by the action of the Groundwater to form sinkholes, tunnels, or even caves?

A. Contaminant(s)
B. Karst aquifer(s)
C. Water soluble limestone
D. None of the above

Groundwater Quality

8. The layers of soil and particles of sand, gravel, crushed rocks, and larger rocks were thought to act as filters, trapping contaminants before they could reach the ground water.

A. True
B. False

9. We know that some contaminants can pass through all of these filtering layers into _____ to contaminate ground water.

A. Saturated zone
B. Water table
C. Karst aquifer(s)
D. None of the above

What Kinds of Substances Can Contaminate Groundwater, and Where Do They Come from?

10. Substances that can contaminate _____ can be divided into two basic categories: substances that occur naturally and substances produced or introduced by man's activities.

A. Ground water
B. Permeable zones
C. Septic tanks, cesspools, and privies
D. None of the above

11. A significant number of today's groundwater contamination problems stem from _____and can be introduced into groundwater from a variety of sources?

A. Contaminant(s)
B. Man's activities
C. Iron, calcium, and selenium
D. None of the above

Agricultural Activities

12. Agricultural activities make significant contributions to groundwater contamination with the millions of tons of fertilizers and pesticides spread on the ground and from the storage and disposal of livestock wastes.

A. True
B. False

Landfills

13. A number of these landfill sites have caused serious groundwater contamination problems and are now being cleaned up by their owners, operators, or users; state governments; or the federal government under the _____.

A. Superfund program
B. Ground water clean –up fund
C. RICO program
D. None of the above

Abandoned Wells

14. Which of the following can be another source of groundwater contamination?

A. Karst aquifer(s)
B. Saturated zone
C. Wells
D. None of the above

15. Abandoned wells without being properly sealed, can act as a direct channel for contaminants to reach ground water?
A. True B. False

What Can Be Done After Contamination Has Occurred?
16. In general, a community whose Groundwater supply has been contaminated has five options: _____to prevent their migration from their source.
A. Contain the contaminants C. Supplies of clean ground water
B. Withdraw the pollutants D. None of the above

17. According to the text, _____ from the Aquifers.
A. Contain the contaminants C. Supplies of clean ground water
B. Withdraw the pollutants D. None of the above

18. According to the text, treat the ground water where it is _____ or at its point of use.
A. Contain the contaminants C. Supplied of clean ground water
B. Withdrawn D. None of the above

19. Rehabilitate the _____ by either immobilizing or detoxifying the contaminants while they are still in the aquifer.
A. Aquifer C. Supplies of clean ground water
B. Toxic chemicals D. None of the above

Are There Federal Laws or Programs to Protect Ground Water?
20. The U.S. Occupational Administrative Agency is responsible for federal activities relating to the quality of ground water.
A. True B. False

21. Which of the following authorizes EPA to set standards for maximum levels of contaminants in drinking water, regulate the underground disposal of wastes in deep wells, designate areas that rely on a single aquifer for their water supply?
A. The Clean Water Act C. The Safe Drinking Water Act
B. RCRA D. None of the above

22. Which of the following regulates the storage, transportation, treatment, and disposal of solid and hazardous wastes?
A. The Clean Water Act C. The Resource Conservation and Recovery Act
B. The Safe Drinking Water Act D. None of the above

23. According to the text, the Comprehensive Environmental Response, Compensation, and Liability Act authorizes the government to clean up contamination caused by chemical spills or hazardous waste sites that could pose threats to the environment, and whose 1986 amendments include provisions authorizing citizens to sue violators of the law and establishing?
A. Community right-to-know C. The Resource Conservation and Recovery Act
B. The Safe Drinking Water Act D. None of the above

24. The Federal Insecticide, Fungicide, and Rodenticide Act, which authorizes which term to control the availability of pesticides that have the ability to leach into ground water?

A. The Clean Water Act
B. EPA
C. OSHA
D. None of the above

25. Which of the following authorizes EPA to control the manufacture, use, storage, distribution, or disposal of toxic chemicals that have the potential to leach into ground water?

A. The Clean Water Act
B. The Toxic Substances Control Act
C. Resource Conservation Act
D. None of the above

26. Which of the following authorizes EPA to make grants to the states for the development of Groundwater protection strategies and authorizes a number of programs to prevent water pollution from a variety of potential sources?

A. The Clean Water Act
B. The Toxic Substances Control Act
C. Resource Conservation Act
D. None of the above

Water Well Reports and Hydrogeology
Hydrogeologic Data

27. For hydrogeologists to make reliable assessments about the current and future status of ground water, they need to know where groundwater occurs in the subsurface, what the properties are of the various geologic units below the surface, and how fast and in what direction Groundwater is moving.

A. True
B. False

Depth to the Aquifer

28. It is important to know the type of geologic materials that occur from the surface down to the top of the?

A. Aquifer
B. Hydraulic head
C. Amount of recharge to the aquifer
D. None of the above

Nature of the Aquifer

29. An unconfined aquifer has which missing term as its upper surface; there are no significant low-permeability layers between the water table and the surface?

A. Aquifer
B. Hydraulic head
C. Water table
D. None of the above

30. According to the text, the top of the aquifer, can rise or fall depending on water use and amount of recharge to the aquifer and is called?

A. Aquifer
B. Hydraulic head
C. Water table
D. None of the above

31. Which of the following has a low-permeability geologic formation as its upper boundary?

A. Hydraulic head
B. A confined aquifer
C. Hydraulic conductivity
D. None of the above

Hydraulic Head (h)

32. According to the text, the hydraulic head is a measure of the water at a certain depth possesses because of its elevation and the pressure exerted through the weight of the water above it.

A. True B. False

33. Porosity is the driving force for groundwater movement either in a horizontal or vertical direction.

A. True B. False

34. Which of the following has units of feet, and generally corresponds to the elevation of water in the well?

A. Aquifer (porosity) C. Amount of recharge to the aquifer
B. Hydraulic head D. None of the above

35. Which of the following moves from where the head is higher to where the head is lower?

A. Hydraulic head C. Hydraulic conductivity
B. Groundwater D. None of the above

Aquifer Porosity (n)

36. The volume of open space relative to the _____and the degree to which these pore spaces are interconnected controls the volume of water in the aquifer and the amount of water that can be reasonably withdrawn from the aquifer.

A. Total volume of the aquifer (porosity) C. Amount of recharge to the aquifer
B. Hydraulic head D. None of the above

Permeability of the Aquifer (K)

37. Which of the following or the permeability of the aquifer is a measure of how fast Groundwater can move through the aquifer?

A. Hydraulic head C. Conductivity
B. Hydraulic conductivity D. None of the above

38. Which of the following has units of distance/time, e.g., feet/day, although it does not represent an actual speed?

A. Hydraulic head C. Hydraulic conductivity
B. Permeability D. None of the above

In What Direction Is Groundwater Flowing?

39. If several wells produce from the same aquifer, we can estimate the direction of Groundwater flow.

A. True B. False

40. The direction of groundwater flow is from higher to lower?

A. Hydraulic head C. Aquifer (porosity)
B. Geologic materials D. None of the above

41. Which of the following can be measured by lowering a probe through the observation port of a number of wells, all within the same relative time period?
A. Hydraulic head C. Storage coefficient of the aquifer
B. A confined aquifer D. None of the above

What Is the Drawdown Associated with Pumping of a Well?
42. There is a relation between the pumping rate of the well, the transmissivity of the aquifer, the distance between wells, this missing term, and the duration of the pumping event.
A. Hydraulic head C. Storage coefficient of the aquifer
B. A confined aquifer D. None of the above

Depth to First Water-Bearing Zone
43. Some report the depth at which water is first encountered in?
A. The drill hole C. Recharge and discharge zone(s)
B. The yield D. None of the above

Static Water Level
44. The driving force for groundwater movement is the hydraulic head, and the _____ is a measure of that force.
A. Static water level (SWL) C. Perforated portions of cased wells
B. Data on the well report D. None of the above

45. Which of the following have important implications in groundwater protection and identifying the relation between area groundwater and local streams?
A. Recharge and discharge zone(s) C. Hydrogeologic investigation(s)
B. The yield D. None of the above

46. Identifying where one aquifer ends and another begins is key to identifying the source of the yield for individual wells. Although this often can be determined by careful review of the lithologic log provided by the well constructor, the transition from one aquifer to the next can be indicated by a marked change in the recharge and discharge zones
A. True B. False

47. A progressive change in the perforated portions of cased wells can indicate to the hydrogeologist that the area represents a recharge zone or a discharge zone.
A. True B. False

Water-Bearing Zones
48. In some cases, the screened or perforated portions of cased wells provide a clue, but all too often, the screened interval is either significantly less than the actual static water level.
A. True B. False

49. Arriving at accurate estimates of aquifer parameters or calculating Groundwater velocity requires us to know the thickness of the?
A. Water-bearing zone(s) C. Recharge and discharge zone(s)
B. Yield D. None of the above

Lithologic Log

50. The well log portion of the well report describes what the driller encountered in the subsurface.

A. True B. False

51. Clear descriptions of the material drilled through the relative proportions of silt/clay in the sand units, the locations of weak zones in bedrock, whether a clay unit contains lenses or layers of sand, etc., allow the hydrogeologist to better estimate the _____of these zones?

A. Static water level C. Perforated portions of cased wells
B. Potential permeability D. None of the above

Contributions of Well Constructors to Hydrogeology

52. Well constructors can provide important contributions to the science by making careful observations and measurements when recording that data on the?

A. Static water level C. Perforated portions of cased wells
B. Well report D. None of the above

How Wells Are Drilled

53. A few examples of today's more common well drilling methods include rotary, auger, and cable tool with?

A. Many variations of each C. A highly trained and skilled driller
B. Typical drilling fluid(s) D. None of the above

54. Which of the following stabilize the hole and aid in the removal of cuttings?

A. Drilling fluids C. The cutting head
B. The bucket D. None of the above

55. Drilling fluids are often used during drilling in order to keep the borehole open while drilling is done.

A. True B. False

56. Typical drilling fluids may be water, mud, air, chemical or natural additives, or combinations of each.

A. True B. False

57. Air rotary with which term is particularly suited for hard rock drilling, while mud rotary is better suited for drilling in sediment?

A. Downhole hammer C. A sub
B. The cutting head D. None of the above

Pump Selection

Three Basic Types of Wells

58. Bored or shallow well(s)are usually bored into an unconfined water source, generally found at depths of _____ feet or less.

A. 1000 C. 100
B. 50 D. None of the above

59. Which of the following are drilled into a formation consisting entirely of a natural rock formation that contains no soil and does not collapse?
A. Consolidated or rock wells C. Unconsolidated or sand well(s)
B. Power requirement(s) D. None of the above

60. Which of the following are drilled into a formation consisting of soil, sand, gravel, or clay material that collapses upon itself?
A. Consolidated or rock wells C. Unconsolidated or sand well(s)
B. Power requirement(s) D. None of the above

Selection of Pumping Equipment
61. The proper selection of pumping equipment for a well is of great importance.
A. True B. False

Pumping Lift and Total Dynamic or Discharge Head
62. The most important components in selecting the correct pump for your application are: total pumping lift and?
A. Cavitation C. Total dynamic or discharge head
B. Velocity head D. None of the above

63. Which of the following refers to the total equivalent feet of lift that the pump must overcome in order to deliver water to its destination, including frictional losses in the delivery system?
A. Total dynamic head C. Total equivalent feet of lift
B. Power requirement(s) D. None of the above

Basic Pump Operating Characteristics
64. Pressure and head are interchangeable concepts in irrigation, because a column of water .433 feet high is equivalent to 2.31 pound per square inch of pressure.
A. True B. False

65. Which of the following of a pump is composed of several types of head that help define the pump's operating characteristics?
A. Total head C. Pressure head
B. Velocity head D. None of the above

Total Dynamic Head
66. The total dynamic head of a pump is the sum of this term, the pressure head, the friction head, and the velocity head.
A. Total static head C. Total friction head
B. Power requirement(s) D. None of the above

67. The Total Dynamic Head is the sum of the total static head, the missing term and the pressure head.
A. Total static head C. Total friction head
B. Power requirement(s) D. None of the above

Total Static Head
68. The total static head is the total vertical distance the pump must lift the water.
A. True B. False

69. When pumping from a well, it would be the distance from the pumping water level in the well to the ground surface plus _____ the water is lifted from the ground surface to the discharge point.
A. Total static head C. Loss of head
B. Vertical distance D. None of the above

Pressure Head
70. 20 PSI is equal to 20 times 2.31 or 46.2 feet of head.
A. True B. False

Friction Head
71. The velocity of the water has a significant effect on?
A. Friction loss C. Loss of head
B. Pressure head D. None of the above

72. Values for these losses can be calculated or obtained from friction loss tables. The friction head for a piping system is the sum of all the?
A. Friction head C. Total dynamic or discharge head
B. Friction losses D. None of the above

Velocity Head
73. Velocity head is the energy of the water due to?
A. Suction head C. Its velocity
B. Velocity head D. None of the above

Suction Head
74. According to the text, the suction head includes not only the vertical suction lift, but also the friction losses through the pipe, elbows, foot valves, and other fittings on the suction side of the pump.
A. True B. False

75. There is an allowable limit to this term on a pump and the net positive suction head of a pump sets that limit.
A. Cavitation C. Loss of head
B. Suction head D. None of the above

76. The theoretical maximum height that water can be lifted using suction is 21 feet.
A. True B. False

77. The NPSH curve will increase with increasing flow rate through the pump.
A. True B. False

78. At a certain flow rate, the NPSH is subtracted from 23 feet to determine the maximum suction head at which that pump will operate.
A. True B. False

79. Operating a pump with _____ than it was designed for, or under conditions with excessive vacuum at some point in the impeller, may cause cavitation.
A. Suction lift greater C. Loss of head
B. Velocity head D. None of the above

80. Which of the following is the implosion of bubbles of air and water vapor and makes a very distinct noise like gravel in the pump?
A. Friction head C. Cavitation
B. Pressure head D. None of the above

81. Which of the following must also protect water quality between the source and the customer's tap?
A. Distribution system C. Hydropneumatic tanks and surge tanks
B. Fire protection D. None of the above

82. Care must be taken that no foreign material is introduced into the system during pipe laying operations. Pipe ends should be covered at the end of the work day or during interruptions of construction.
A. True B. False

Water Use or Demand
83. Water system demand comes from a number of sources including residential, commercial, industrial and public consumers as well as waste and some?
A. System integrity C. Maximum daily use
B. Unavoidable loss D. None of the above

84. Which of the following is desired, that could also represent a rather significant demand upon the system?
A. Distribution system C. Hydropneumatic tanks and surge tanks
B. Fire protection D. None of the above

85. Which of the following is usually encountered during the summer months and can vary widely depending on irrigation practices?
A. Pressure C. Unavoidable loss and waste
B. Maximum daily use D. None of the above

86. The combination of storage reservoirs and distribution lines must be capable of meeting consumers' needs for pressure at all times.
A. True B. False

87. The quantity of water used in any community varies from 100 to 200 gallons per person per day.
A. True B. False

88. A common design assumption is to use from 100 to 150 gallons per person per day for average domestic use.
A. True B. False

89. The maximum daily use is approximately 3 to 5 times the average daily use.
A. True B. False

Water Pressure
90. 2.31 feet of water is equal to 1 psi, or 1 foot of water is equal to about a half a pound (.433 pounds to be exact).
A. True B. False

91. For ordinary domestic use, water pressure should be between 25 and 45 psi.
A. True B. False

92. 20 psi is considered the minimum required at any point in the water system, so that this _____ is prevented.
A. Water pressure C. Cavitation
B. Backflow and infiltration D. None of the above

93. Which of the following is provided by the direct force of the water, or by the height of the water?
A. Pressure C. Unavoidable loss and waste
B. Maximum daily use D. None of the above

Storage and Distribution
Water Storage Facilities
94. According to the text, there are different types that are used in the water distribution systems, such as stand pipes, elevated tanks and reservoirs, hydropneumatic tanks and?
A. Distribution system C. Surge tanks
B. Water pressure D. None of the above

Storage Reservoirs
95. According to the text, it is also recommended that storage reservoirs be located at a high enough elevation to allow the water to flow by which term to the distribution system?
A. System integrity C. Maximum daily use
B. Gravity D. None of the above

96. According to the text, some storage for _____ should be provided.
A. Fire protection C. Cross-connection
B. Stored water D. None of the above

97. Which of the following are also used as detention basins to provide the required chlorine contact time necessary to ensure the adequacy of disinfection?
A. Reservoir(s) C. Stored water
B. Steel tank(s) D. None of the above

Water Storage Introduction
98. According to the text, treated or pumped water is placed in _____in order for disinfection to take place.
A. Storage reservoirs C. A closed tank or reservoir
B. Repairing and replacing these facilities D. None of the above

Storage and Distribution
99. The cost of supplying water to the users of any water system includes are on-going maintenance costs associated with cleaning, repairing and replacing these facilities.
A. True B. False

100. Water storage facilities and tanks vary in different types that are used in the water distribution systems, such as stand pipes, elevated tanks and reservoirs, hydropneumatic tanks and?

A. Adequate pressure
B. Steel reservoirs
C. Surge tanks
D. None of the above

When Finished with Your Assignment

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