

Groundwater Practice Quiz

Kentucky Operator Certification Program



1. An aquifer is
 - a) a brand of bottled water.
 - b) an underground layer of porous, water bearing material.
 - c) an above ground storage facility.
 - d) a deep water well.

2. Drinking water licenses must be renewed
 - a) every year.
 - b) after June 30th of odd numbered years.
 - c) before June 30th of odd numbered years.
 - d) before June 30th of even numbered years.

3. Another name for bleach relative to disinfection is
 - a) sodium hypochlorite.
 - b) sodium thiosulfate.
 - c) sodium brine.
 - d) calcium hypochlorite.

4. What is the specific capacity of a well that is pumping 495 gpm, has a static level of 55 feet and a pumping level of 110 feet?
 - a) 2.6 gpm/ft of drawdown
 - b) 9.0 gpm/ft of drawdown
 - c) 5.8 gpm/ft of drawdown
 - d) 7.4 gpm/ft of drawdown

5. Groundwater is _____ to clean up pollutants than surface water.
 - a) easier
 - b) less costly
 - c) quicker
 - d) harder

6. The main operating unit in a centrifugal pump is
 - a) foot valve.
 - b) impeller.
 - c) volute.
 - d) diaphragm.

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7. Water is flowing through a 16 inch pipe at a rate of 14 fps. What is the flow?
- a) 19.4 cuft/sec
 - b) 28.6 cuft/sec
 - c) 1.3 cuft/sec
 - d) 23. 5 cuft/sec
8. Class II water treatment operators needs _____ hours of continuing education a renewal period to keep their licenses.
- a) 6
 - b) 12
 - c) 18
 - d) 24
9. A pitless adaptor refers to
- a) an attachment to the well casing to provide a sanitary seal between the well casing and the effluent line.
 - b) a device that allows a well to be pumped from without actually digging a well pit.
 - c) a view tube that allows a visual contact to the well for inspection purposes.
 - d) an adaptor that allows for the changing of pipe diameters without re-drilling of the bore hole.
10. The maximum height that a single centrifugal pump can theoretically push water is
- a) 2.3 feet.
 - b) 33.9 feet.
 - c) 44.3 feet.
 - d) 39.1 feet.
11. Subsidence as it relates to groundwater is defined as
- a) a level at which the chlorine demand is satisfied.
 - b) the sinking of land resulting from groundwater extraction.
 - c) an underground water-bearing area with enough capacity to satisfy demand.
 - d) a subsidy granted from the EPA to small groundwater systems.

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12. Why do we monitor for nitrates?
- a) pathogens
 - b) cryptosporidium
 - c) methelomoglobinemia (blue baby syndrome)
 - d) fecal coliforms
13. The principle scale forming substance in water is
- a) calcium carbonate.
 - b) tuberculation.
 - c) manganese.
 - d) magnesium.
14. MCL is an acronym for
- a) Maximum Coliform Level.
 - b) Majority Contaminants Labeled.
 - c) Maximum Contaminant Level.
 - d) Minimum Cryptosporidium Levels.
15. Lead and copper samples should be
- a) taken quarterly.
 - b) stored in a cool dry place for eight hours.
 - c) taken at the entrance to the distribution system.
 - d) taken at the customers tap.
16. A pH value of _____ is considered neutral.
- a) 3
 - b) 6
 - c) 7
 - d) 9
17. Hydrogen sulfide smells like
- a) perfume.
 - b) rotten eggs.
 - c) earthy, musky.
 - d) flowers.

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18. A disease causing organism is called
- a) a bacteria.
 - b) a parvum.
 - c) an Oocysts.
 - d) a pathogen.
19. Which word does not describe a term in the hydrological cycle?
- a) participation
 - b) condensation
 - c) runoff
 - d) precipitation
20. A temperature reading of 15°C is equal to _____°F.
- a) 40
 - b) 59
 - c) 65
 - d) 77
21. What will a pressure gauge five feet from grade on an 81 foot tall standpipe read?
- a) 75 psi
 - b) 187 psi
 - c) 33 psi
 - d) 102 psi
22. To effectively flush distribution system lines a minimum velocity of _____ should be achieved.
- a) 7.5 cuft/sec
 - b) 20 fps
 - c) 13 fps
 - d) 2.5 fps

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23. Water consumption in a municipality that uses meters as opposed to flat billing, the water usage would
- a) be higher.
 - b) be lower.
 - c) not change.
 - d) no definitive answer one way or another
24. By regulation, the minimum design pressure in distribution systems is
- a) 20 psi.
 - b) 30 psi.
 - c) 35 psi.
 - d) 40 psi.
25. A physical link between a potable water supply and one of unknown or questionable quality is
- a) backsiphonage.
 - b) backpressure.
 - c) air gap.
 - d) cross connection.
26. What is a DPD test used for?
- a) enumerates bacteria
 - b) chlorine analysis
 - c) turbidity analysis
 - d) cryptosporidium
27. Chemical reactions take place more rapidly in _____ water.
- a) colder
 - b) turbid
 - c) warmer
 - d) cloudy

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28. If a liquid has a specific gravity of 1.4 it will weigh
- a) 11.6 lbs.
 - b) 5.9 lbs.
 - c) 87.3 lbs
 - d) 8.7 lbs
29. Calcium hypochlorite does NOT come in which form?
- a) tablet
 - b) powder
 - c) gas
 - d) granular
30. Coliforms are
- a) pathogenic.
 - b) indicator organisms.
 - c) lethal.
 - d) toxic.
31. MCLG is an acronym for
- a) Maximum Chlorine Level Goal.
 - b) Most Common Lucky Guess.
 - c) Maximum Contaminant Level Goal.
 - d) Minimum Colloidal Level Goals.
32. The most important duty of a water treatment operator is
- a) to get promoted as often as possible.
 - b) follow the mayor's directives explicitly.
 - c) get away with as much as possible.
 - d) protect the public health.
33. A centrifugal pump can be started against a closed valve without damaging the pump.
- a) false
 - b) true

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34. A flow rate of 15 cuft/sec is equivalent to
- a) 10,417 gpm.
 - b) 6,732 gpm.
 - c) 8,575 gpm.
 - d) 12,307 gpm.
35. A water system that uses chlorine as a disinfectant but fails to flush their distribution system will cause the chlorine demand to
- a) increase.
 - b) decrease.
 - c) have no effect.
 - d) decrease over time.
- 36) Unidirectional flushing of distribution systems require that which of these conditions to occur?
- a) velocities at a minimum of 2.5 ft/per second
 - b) begin and the source and work out toward the far reaches of the system
 - c) continue at each flushing site until maximum disinfection level is achieved
 - d) all of the above
37. How long will it take for water to travel 500' through a 2" line at 75 gpm?
- a) 60 seconds
 - b) 6 seconds
 - c) 30 seconds
 - d) 18 seconds
38. What is sodium thiosulfate?
- a) a cationic polymer
 - b) a sequestering agent
 - c) a water softening chemical
 - d) a dechlorinating agent

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39. Which is a viable treatment technique for removing hydrogen sulfide?
- a) declassification
 - b) aeration
 - c) sedimentation
 - d) fluoridation
40. Which device provides protection against both backsiphonage and backflow?
- a) barometric loop
 - b) atmospheric vacuum breaker
 - c) reduced pressure zone assembly
 - d) single check valve
41. Chlorine disinfection potential is greater in _____ water and chlorine residual is more persistent in _____ water.
- a) warmer, colder
 - b) colder, warmer
 - c) colder, colder
 - d) warmer, warmer
42. It is important that bacti samples be
- a) 200 milliliters.
 - b) taken from swivel-type faucets.
 - c) taken immediately after turning on the water.
 - d) representative of the system.
43. How many hours does the lab have to analyze your bacti samples?
- a) 12
 - b) 18
 - c) 24
 - d) 30

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44. Greensand filtration preceded by potassium permanganate is an effective removal technique for
- a) iron.
 - b) cryptosporidium.
 - c) lead & copper.
 - d) cadmium.
45. The intention of adding fluoride to our drinking water is to
- a) further communism.
 - b) build strong bones & teeth in children.
 - c) stabilize the pH of water for efficient filtration.
 - d) cause anionic polymers to clump together.
46. 250 ft of head equals
- a) 54 psi.
 - b) 577 psi.
 - c) 81 psi.
 - d) 108 psi.
47. A fire hydrant should not be installed on a line less than _____ inches in diameter.
- a) 2
 - b) 4
 - c) 6
 - d) 8
48. The minimum allowable chlorine residual in any part of a distribution system is
- a) 2.0 ppm.
 - b) 0.2 ppm.
 - c) 1.0 ppm.
 - d) 0.5 ppm.

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49. What device is used to check the flow to water consumers in your area?
- a) heterotrophic plate counts
 - b) atmospheric vacuum breakers
 - c) pressure reducing valves
 - d) water meters
50. For a successful cross connection program to be instituted the first entity developed should be
- a) an ordinance.
 - b) backflow conditions.
 - c) mainline replacement.
 - d) valve exercising program.
51. The primary purpose of disinfecting drinking water is to
- a) meet turbidity guidelines.
 - b) inactivate or kill pathogens.
 - c) reduce hardness.
 - d) reduce iron and manganese issues.
52. Jar tests have indicated chlorine demand to be 3.5 mg/l. The system treats .50 MG with 20 lbs of chlorine gas. What is the chlorine residual?
- a) 3.1 mg/l
 - b) 4.8 mg/l
 - c) 1.3 mg/l
 - d) 2.2 mg/l
53. When a compliance bacte sample is found to be positive for total coliform, resampling must take place. The regulatory designated locations are as follows:
- a) north, south, east, west
 - b) the original location and one sample each within five service sites upstream and downstream
 - c) the original site and one other location
 - d) two samples, anywhere in the system

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54. You treat 350,000 gallons a day and you want to dose your water at 3.5 ppm. How many lbs. of 12 % available sodium hypochlorite will you need to achieve the desired dosage?
- a) 85.1 lbs
 - b) 102.0 lbs
 - c) 10.2 lbs
 - d) 47.1 lbs
55. The number of bacteriological samples that each public water system must collect each month is determined by
- a) the amount of water treated by your treatment facility.
 - b) the number of sample locations you have designated.
 - c) the number of people served by the system.
 - d) past historical number of samples taken.
56. Check samples must be collected within _____ hours after the original sample is found to be positive for total coliforms.
- a) 12
 - b) 18
 - c) 24
 - d) 30
57. You treat 250,000 gallons a day with a 5.25 % available sodium hypochlorite solution. Your desired dosage is 2.5 mg/l. How many gallons would you need?
- a) 99 gallons
 - b) 12 gallons
 - c) 828 gallons
 - d) 41 gallons
58. If using ion exchange as a softening process an adequate supply of _____ is necessary to successfully remove the hardness.
- a) sodium brine solution
 - b) granular media
 - c) anionic and cationic polymers
 - d) peroxide

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59. The corrosion inhibitor used most often in the water business is
- a) sacrificial anodes.
 - b) galvanic accelerators.
 - c) paint.
 - d) orthophosphates.
60. Chlorine gas is _____ than air.
- a) 10 times lighter
 - b) 2.5 times heavier
 - c) 460 times heavier
 - d) 4.0 times lighter
- 61) The MCL for iron is
- a) 0.05 mg/l.
 - b) 1.50 mg/l.
 - c) 0.15 mg/l.
 - d) 0.30 mg/l.
62. An operator could lose his/her license for which reason?
- a) being incompetent
 - b) fraud and/or deception
 - c) not using reasonable judgment
 - d) all of the above
63. Which type of pipe is most likely to be damaged by corrosion?
- a) HDPE
 - b) PVC
 - c) PPE
 - d) iron
64. Primary MCL's relate to _____ issues.
- a) health
 - b) dosages
 - c) aesthetics
 - d) turbidity

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65. Valves on main lines should be opened and closed
- a) quickly.
 - b) intermittently.
 - c) slowly.
 - d) in succession.
66. A new 6" pipe 7500 feet in length has just been installed and needs to be disinfected. How many lbs. of 65 % available calcium hypochlorite will be required to meet regulations?
- a) 4.17 lbs
 - b) 5.40 lbs.
 - c) 7.05 lbs.
 - d) 3.67 lbs.
67. A storage facility that measures 15 feet in diameter and is 20 feet tall would contain how many gallons when completely full?
- a) 35,231 gallons
 - b) 3,533 gallons
 - c) 26,423 gallons
 - d) 4,710 gallons
68. The minimum residual pressure allowable in a distribution system without public notification is
- a) 10 psi.
 - b) 20 psi.
 - c) 30 psi.
 - d) 40 psi.
69. Dissimilar metals reacting to one another in an aqueous solution is called
- a) leeching.
 - b) galvanic corrosion.
 - c) coagulation.
 - d) ion exchange.

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70. Volatile organic chemicals or compounds can usually be successfully removed by
- a) filtration.
 - b) ion exchange.
 - c) disinfection.
 - d) aeration.
71. If the specific gravity of a sodium hypochlorite solution is 1.4, how much would 3 gallons of this solution weigh?
- a) 25.0 lbs
 - b) 30.0 lbs
 - c) 20.0 lbs
 - d) 35.0 lbs
72. Disinfection is more effectively achieved with
- a) high pH.
 - b) high alkalinity.
 - c) low alkalinity.
 - d) low pH.
73. Corrosion can be made more aggressive by
- a) soft water.
 - b) high levels of dissolved oxygen.
 - c) low pH.
 - d) all of the above
74. If you're outside thermometer reads 76°F it would be
- a) 24° C.
 - b) 167° C.
 - c) 96° C.
 - d) 42° C.

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75. What would the water horsepower require if you were pumping at 550 gpm against 29 ft of head?
- a) 8 HP
 - b) 6 HP
 - c) 10 HP
 - d) 4 HP
76. The main operating unit in a centrifugal pump is
- a) a volute.
 - b) an impeller.
 - c) a pump casing.
 - d) a foot valve.
77. If after using the Langeliers Saturation Index your answer would be +.3 it would indicate that your water has the likelihood to be
- a) potable.
 - b) corrosive.
 - c) scale-forming.
 - d) disinfected.
78. Continuing education hours earned in May 2014 could be counted towards a 2016 certification for a Class III-B license.
- a) true
 - b) false
79. The principle scale forming substance in water is
- a) carbolic acid.
 - b) calcium carbonate.
 - c) hydrosilifluoric acid.
 - d) sodium thiosulfate.
80. A radioactive gas that can sometimes be found in groundwater is
- a) mercury.
 - b) arsenic.
 - c) radon.
 - d) uranium.

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81. Relative to an MCL, manganese
- a) has a primary MCL.
 - b) is not an MCL.
 - c) is a MCLG.
 - d) has a secondary MCL.
82. Which term would NOT be used when describing the hydrological cycle?
- a) evaporation
 - b) cohabitation
 - c) condensation
 - d) infiltration
83. Water travels through an 8 inch line at a velocity of 2.1 fps. What is the flow rate in gpm?
- a) 328 gpm
 - b) 730 gpm
 - c) 529 gpm
 - d) 629 gpm
84. Vent openings in storage facilities must be
- a) closed.
 - b) dechlorinated.
 - c) cauterized.
 - d) screened.
85. 75 psi is equivalent to _____ of head.
- a) 32 ft
 - b) 173 ft
 - c) 103 ft
 - d) 68 ft
86. It is possible to have more than one well drawing water from a single aquifer.
- a) true
 - b) false

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87. How much would 2 cu/ft of water weigh?
- a) 16.68 lbs
 - b) 70.74 lbs
 - c) 98.02 lbs
 - d) 124. 80 lbs.
88. A gate valve in a distribution system should be used primarily for
- a) throttling.
 - b) pressure reduction.
 - c) isolation.
 - d) fire fighting.
89. The two general types of backflow are
- a) backpressure and isolation.
 - b) restricted flow and reverse flow.
 - c) gravitational flow and pumped flow.
 - d) backpressure and backsiphonage.
90. Disinfection by products are formed when chlorine reacts with
- a) air.
 - b) organics.
 - c) total suspended solids.
 - d) dissolved oxygen.
91. Five miles of newly laid 10 inch pipe must be disinfected with 70% available calcium hypochlorite before being put into service. How many lbs of HTH will be needed to accomplish this task?
- a) 26 lbs
 - b) 41 lbs
 - c) 64 lbs.
 - d) 96 lbs

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92. The amount of water needed for a bacti sample is
- a) 1 quart.
 - b) 1 liter.
 - c) 100 ml.
 - d) 1000 ml.
93. BARF is an acronym for
- a) Biological Activity Report Form.
 - b) Bacteriological Analysis Report Form.
 - c) Barium Analytical Revised Format.
 - d) Bacteriological Activity Report Form.
94. A circular contact tank is 24" in diameter and filled to a depth of 54". How many gallons could this tank hold?
- a) 37.0 gallons
 - b) 59.9 gallons
 - c) 14.1 gallons
 - d) 105.7 gallons
95. Using the tank in the previous problem, an operator adds 1 gallon of bleach with a specific gravity of 1.2 and then fills the tank to the 48" mark with water. What is the solution strength of the hypochlorite mixture?
- a) 1.26%
 - b) .0126%
 - c) 9.7%
 - d) .097%
96. The MRDL is
- a) 2.
 - b) 4.
 - c) 6.
 - d) 8.

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97. What does a wellhead and a baby seal have in common?
- a) nothing
 - b) they both need a sanitary seal
 - c) they both have heads
 - d) they both exist in water
98. Factors that have an impact on disinfection include
- a) temperature.
 - b) pH.
 - c) contact time.
 - d) all of the above.
99. An operator add 67.4 lbs of 65% available HTH to disinfect 1.5 MGD of water. At the far reaches of the distribution system is 0.5 ppm. What is the chlorine demand?
- a) 2.5 ppm
 - b) 3.5 ppm
 - c) 3.0 ppm
 - d) 2.0 ppm
100. The largest percentage of waterborne disease outbreaks have been attributed to
- a) poor treatment techniques.
 - b) improper flushing procedures.
 - c) backflow.
 - d) main breaks.

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Answer Key

1) b	26) b	51) b	76) b
2) d	27) c	52) c	77) c
3) a	28) a	53) b	78) b
4) b	29) c	54) a	79) b
5) d	30) b	55) c	80) c
6) b	31) c	56) c	81) d
7) a	32) d	57) b	82) b
8) b	33) b	58) a	83) a
9) a	34) b	59) c	84) d
10) b	35) a	60) b	85) b
11) b	36) d	61) d	86) a
12) c	37) a	62) d	87) d
13) a	38) d	63) d	88) c
14) c	39) b	64) a	89) d
15) d	40) c	65) c	90) b
16) c	41) a	66) c	91) c
17) b	42) d	67) c	92) c
18) d	43) d	68) b	93) b
19) a	44) a	69) b	94) d
20) b	45) b	70) d	95) a
21) c	46) d	71) d	96) b
22) d	47) c	72) d	97) b
23) b	48) b	73) d	98) d
24) b	49) d	74) a	99) c
25) d	50) a	75) d	100) c