51. The amount of oxygen that may become dissolved in a given amount of water is most related to
   a. hardness.
   b. TDS.
   c. temperature.
   d. turbidity.

52. The gas most commonly associated with septic wastewater is
   a. carbon dioxide.
   b. carbon monoxide.
   c. hydrogen sulfide.
   d. methane.

53. What determines the amount of hydrogen sulfide produced in a sewer?
   a. BOD concentration.
   b. DO concentration.
   c. pH.
   d. SS concentration.

54. Four conditions are necessary to create an explosion. Three of these conditions are: combustible gas, adequate oxygen and sufficient heat. What is the fourth?
   a. constant supply of combustible gas.
   b. enclosed area that will hold the gases.
   c. proper mixing of gas and oxygen.
   d. none of the above.

55. A flow of 650 gpm would be how many mgd?
   a. 0.472.
   b. 0.936.
   c. 1.714.
   d. 1.923.

56. A temperature reading of 59 degrees Fahrenheit would be equal to what value on the Centigrade scale?
   a. -4 C.
   b. 15 C.
   c. 27 C.
   d. 45 C.

57. A kilowatt is the equivalent of
   a. 0.67 amperes at a voltage of 120.
   b. 1.34 horsepower.
   c. 746 watts.
   d. 1,000 megacycles.
58. The lack of an unpleasant odor in a manhole, lift station or other structures does not always mean that no dangerous gases are present because
   a. some dangerous gases have no odor.
   b. oxygen may still be lacking.
   c. some gases deaden the sense of smell.
   d. all of the above.

59. As the impeller wears on a pump, the pump efficiency will
   a. decrease.
   b. improve.
   c. increase.
   d. not change.

60. How closely an instrument measures the actual value of the process variable being measured is called its
   a. accuracy.
   b. calibration.
   c. precision.
   d. standardization.

61. Items that must be examined when inspecting manholes include
   a. corrosion.
   b. cracks.
   c. elevation of lid.
   d. all of the above.

62. Vibrations in pumps may be caused by improper motor-pump
   a. alignment.
   b. curves.
   c. piping.
   d. power factor.

63. Advantages of a video tape recording system include
   a. ability to see what's happening when camera is under water.
   b. cheaper than a polaroid camera.
   c. length and severity of defective areas can be recorded.
   d. visitors are impressed.

64. The most widely used type of prime mover in a pumping plant is
   a. diesel engine.
   b. electric motor.
   c. gas engine.
   d. steam engine.

65. "Schedule 40" refers to
   a. flow capacity.
   b. friction loss.
   c. tubing strength.
   d. wall thickness.
66. Hazards that may damage a TV camera going through a sewer include
   a. deep water that submerges the camera.
   b. fogging of optical lens.
   c. offset joints.
   d. all of the above.

67. Centrifugal pump parts include
   a. diaphragm.
   b. piston.
   c. rotor.
   d. volute.

68. When packing a centrifugal pump, the packing gland should be tightened
   a. slowly over a period of several hours.
   b. to 20 foot pounds.
   c. with wrench and then backed off 1/4 turn.
   d. none of the above.

69. What factors should be considered when providing trench shoring?
   a. grade of sewer.
   b. pipe material.
   c. structures or sources of vibration near trenches.
   d. all of the above.

70. What is the volume of 1,000 feet of 8-inch line?
   a. 2,201 gallons.
   b. 2,611 gallons.
   c. 3,915 gallons.
   d. 4,217 gallons.

71. If an eight-inch force main has a metered flow rate of 400,000 gpd, what is the
    velocity?
    a. 0.42 fps.
    b. 0.96 fps.
    c. 1.18 fps.
    d. 1.77 fps.

72. Construction defects that cause problems in wastewater collection systems include
    a. improper grade of sewers.
    b. improper taps.
    c. structure failure of manholes.
    d. all of the above.

73. During the 24-hour operation, a lift station pumped 3,000 gallons per minute for a
    community of 27,000. What is the per capita pumped in gallons per day?
    a. 100.
    b. 110.
    c. 120.
    d. 160.
74. A wet well 20 feet in diameter is filled with water to a depth of 10 feet. How many gallons does the tank contain?
   a. 2,355 gallons.
   b. 3,140 gallons.
   c. 23,500 gallons.
   d. 31,400 gallons.

75. A venturi meter measures quantity of fluid by
   a. difference in pressure between a constricted and a full-size portion.
   b. electronic measurement.
   c. velocity of the fluid past a given point.
   d. weight of the fluid.

76. How can the members of a bailing crew communicate with each other?
   a. hand signals.
   b. shouting down the sewer.
   c. telegraph.
   d. writing.

77. Which of the following is the most common factor leading to the generation of hydrogen sulfide in sewers?
   a. anaerobic conditions.
   b. constantly high velocity of flow in sewers.
   c. low concentrations of ferrous sulfide.
   d. presence of highly soluble fats and oils.

78. When sewer line grades are too flat, an odor problem is likely to result. The most likely cause of the odor problem is decreased velocity which
   a. allows decomposable solids to settle.
   b. decreases the treatment time in the lines.
   c. increases the treatment time of inorganic solids.
   d. none of the above.

79. After a collection system problem has been solved, you should
   a. wait until tomorrow to fill out the report forms.
   b. take a break.
   c. go home.
   d. evaluate the effectiveness of the results.

80. Why must you always know where a cleaning tool is in a sewer?
   a. so the tool can find its way back.
   b. so you can locate it when resuming work after an interruption.
   c. so you know where obstructions or difficulties are encountered.
   d. none of these.

81. Improper connections can be detected through
   a. DO tests.
   b. soundings.
   c. TV inspections
   d. all of the above.
82. When pouring a concrete slab, which of the following tools is used to compact the concrete and bring a cement film to the surface for finishing?
   a. grasshopper.
   b. tamper.
   c. trowel.
   d. vibrator.

83. Emergency stoppages in pipelines may be cleared safely by use of
   a. hand rods.
   b. high velocity cleaners.
   c. power rodders.
   d. all of the above.

84. Mark the correct equation for determining the amount of chlorine required for a dosage of 10 mg/L in 500,000 gallons of flow.
   a. 0.05 x 7.48 x 10 = lb cl₂
   b. 0.05 x 8.34 x 10 = lb cl₂
   c. 0.5 x 7.48 x 10 = lb cl₂
   d. 0.5 x 8.34 x 10 = lb cl₂

85. The static pressure in a pipe line is 120 psi. How much head, in feet, creates that much pressure?
   a. 51.9.
   b. 60.0.
   c. 277.2.
   d. 900.0.

86. If in 24 hours you feed 200 gallons of 15% hypochlorite solution, how much would you have to use if the concentration was 10%?
   a. 30 gallons.
   b. 133 gallons.
   c. 300 gallons.
   d. 1333 gallons.

87. Your chlorinator room should have an exhaust vent installed
   a. near the ceiling.
   b. near the floor.
   c. halfway up the wall.
   d. at the chlorinator bell jar.

88. Rodents and insects can be controlled by
   a. aeration.
   b. spraying manholes with an approved pesticide.
   c. vacuum filtration.
   d. all of the above.

89. What is a mechanical means to remove material from a sewer?
   a. brushing.
   b. pumping.
   c. scraping.
   d. sweeping.
90. Hydrogen peroxide controls odors by
   a. decreasing the DO.
   b. neutralizing pH.
   c. oxidizing sulfide components.
   d. providing a source of hydrogen ions.

91. Which of these pH readings indicates an acidic wastewater?
   a. 3.
   b. 7.
   c. 9.
   d. 12.

92. The record log of a hydraulic cleaning operation should include
   a. type and amount of material removed from downstream manhole.
   b. feet of rod used.
   c. camera malfunctions.
   d. all of the above.

93. What type of pump is not seriously damaged if the discharge valve is closed for a short time while the pump is running?
   a. centrifugal pump.
   b. diaphragm pump.
   c. piston pump.
   d. plunger pump.

94. Yokes, rollers, jacks, swivels, pull in machine and loader are accessories used in
   a. catch basin cleaning.
   b. jet rodding.
   c. power-bucket machine cleaning.
   d. power rodding.

95. Sources of excessive clear water in a collection system include
   a. a problem at the wastewater treatment plant.
   b. a water distribution main construction project.
   c. evaporation.
   d. infiltration from a high water table.

96. What should be your most important concern after a chemical spill?
   a. aquatic life.
   b. clean-up procedures.
   c. health-related effects.
   d. odors.

97. A sewer-use ordinance should specify the personnel performing
   a. cleaning of the main lines.
   b. monitoring.
   c. repairing of broken pipes.
   d. sealing of leaky joints.
98. What factor must be considered when obtaining an easement for construction and maintenance of a collection system?
   a. compaction.
   b. deposition of cut materials.
   c. revegatation.
   d. manhole headroom.

99. Sewers which are located adjacent to a ground storage reservoir are required to be located at least 10 feet from the structure and be constructed of watermain-type materials for a distance of at least 50 feet from the storage reservoir. What is the reason for this requirement?
   a. prevent a high ground water table adjacent to the reservoir.
   b. protect the storage reservoir from contamination.
   c. reduce infiltration into the sewer.
   d. vitrified-clay sewer pipe is easily broken.

100. Sewer maps should be kept up-to-date for several reasons. Which of the following is the least appropriate reason?
   a. so a TV inspection program can be planned and scheduled effectively.
   b. so that census canvassers can determine data on standards of living.
   c. so that new house services can be connected with minimum difficulty.
   d. to permit development of better plans and specifications for street improvement projects.
Answers
Collection Study Guide
Class II

51. c  76. a
52. c  77. a
53. c  78. a
54. c  79. d
55. b  80. c
56. b  81. c
57. b  82. d
58. d  83. d
59. a  84. d
60. a  85. c
61. d  86. c
62. a  87. b
63. c  88. b
64. b  89. c
65. d  90. c
66. d  91. a
67. d  92. a
68. a  93. a
69. c  94. c
70. b  95. d
71. d  96. c
72. d  97. b
73. d  98. b
74. c  99. b
75. a  100. b