1. Hydrogen sulfide gas smells like
   a. dead fish.
   b. fuel gas.
   c. rotten cabbage.
   d. rotten eggs.

2. Why are gasoline and volatile solvents objectionable when present in a sewer?
   a. they produce an explosion hazard.
   b. they tend to cause the solids to vaporize.
   c. they will coagulate floatables and cause stoppages.
   d. none of the above.

3. The formula for calculating the volume of a wet well is
   a. $V = L \times W \times C$.
   b. $V = W \times A \times P$.
   c. $V = W \times L \times H$.
   d. $V = W \times H \times D$.

4. Biological activity in long, sluggish-flow, flat-grade sewer lines will likely cause
   a. concrete and metal corrosion.
   b. oxygen deficiency in the air in manholes, sewers or wet wells.
   c. toxic gas production.
   d. all of the above.

5. Tasks performed by a collection system operator include
   a. cleaning local treatment plants.
   b. maintaining collection system equipment.
   c. making water connections.
   d. none of the above.

6. One cubic foot per second flow is equal to ______ gallons per hour.
   a. 2794
   b. 3600
   c. 6000
   d. 26,928

7. On floors where water or chemicals are commonly spilled, cover the floors with
   a. catwalks.
   b. linoleum.
   c. tile.
   d. wood.
8. You should never attempt to install, troubleshoot, maintain, repair or replace electrical equipment panels, controls, wiring or circuits unless
   a. a manhole is overflowing down a street.
   b. a pump is plugged.
   c. you are receiving lots of odor complaints.
   d. you know what you are doing, are qualified, and are authorized.

9. Employee hazards in collection system operations include
   a. noxious or toxic gases or vapors.
   b. oxygen deficiency.
   c. physical injuries.
   d. all of the above.

10. GPM means gallons per
    a. mile.
    b. milliliter.
    c. minute.
    d. month.

11. Leakage of seal water around the packing on a centrifugal pump is required because it acts as a(n)
    a. adhesive.
    b. coolant.
    c. lubricant.
    d. vapor barrier.

12. What must be checked before entering a manhole?
    a. atmosphere in manhole.
    b. equipment.
    c. proper barricades or warning devices around manhole.
    d. all of the above.

13. In sewer maintenance, what is a pig?
    a. a ball forced through a sewer line.
    b. a power rod.
    c. any foul smelling equipment.
    d. the hydraulic rodding truck.

14. The purpose of ribs on the outside of a Wayne Sewer Ball is to
    a. allow the ball's weight to be closer to the ball's center.
    b. avoid patent infringement that would apply if a non-ribbed ball was used.
    c. cause jet action to aid in the hydraulic flushing of the sewer line.
    d. reinforce (strengthen) the ball.

15. A pump is delivering at less than the expected rate of discharge. What will not cause this to happen?
    a. check valve stuck or clogged.
    b. discharge head too low.
    c. impeller clogged.
    d. pump not primed.
16. Wearing rings are installed in a pump to
   a. concentrate wear on an economically replaceable part.
   b. hold the shaft in position.
   c. keep the impeller in place.
   d. wear out rings instead of sleeves.

17. A lantern ring is a
   a. metal ring for lowering an explosive-gas detector candle into manholes and wet wells.
   b. shaft coupling that has been completely worn through in spots or that has "daylighted."
   c. spacer ring in a pump packing gland to improve seal water distribution.
   d. type of coupling for joining pipes that will not be covered or put in the dark for at least 5 days.

18. Mechanical ventilation of a lift station is required to
   a. lower temperatures to reduce production of hydrogen sulfide.
   b. reduce chlorine demand.
   c. reduce corrosion.
   d. increase d.o. in raw wastewater.

19. To properly operate a power rodder
   a. do not jam rodding tool into an obstruction.
   b. do not rotate the rod in one position for extended periods.
   c. if a rod should break, make sure all the torque is out of it.
   d. all of the above.

20. Check valves are used in connection with centrifugal pumps in order to
   a. equalize the pressure on both sides of the impeller.
   b. prevent water in the suction line from flowing back into the reservoir.
   c. prevent water in the discharge line from flowing back.

21. You should get out of a manhole as soon as you start feeling
   a. thirsty.
   b. sick to your stomach.
   c. like sneezing.
   d. dirty.

22. What information must be on a warning tag attached to a switch that has been locked out?
   a. directions for removing tag.
   b. name of nearest physician to call in case of an emergency.
   c. signature of person who locked out switch and who is the only person authorized to remove tag.
   d. time to unlock switch.

23. Enclosed, open and semi-closed are terms used for the designation and selection of
   a. impellers.
   b. lantern rings.
   c. sleeves.
   d. stuffing boxes.
24. What is (are) used to remove grease?
   a. bar screens.
   b. biological treatment.
   c. chemicals.
   d. all of the above.

25. A Parshall flume is a type of
   a. orifice.
   b. submerged nozzle.
   c. venturi.
   d. weir requiring free-fall discharge.

26. Which of these chemicals should be used for odor control in sewers?
   a. chlorine.
   b. muriatic acid.
   c. potassium chloride.
   d. sodium chloride.

27. Which of the following are types of shores?
   a. bar.
   b. hydraulic.
   c. truss.
   d. all of the above.

28. Important traffic safety considerations include
   a. routing pedestrians around job site.
   b. routing traffic around job site.
   c. wearing of hard hats and safety vests.
   d. all of the above.

29. Which of the following first aid actions would you perform first if an operator inhales chlorine gas?
   a. immediately remove patient from contaminated area.
   b. immediately call physician or paramedic.
   c. immediately begin appropriate treatment.
   d. do nothing, as chlorine gas is non-toxic.

30. Flatter sewer line grades may cause added sewer maintenance expense and odor nuisance. The problem is most likely caused by
   a. a decrease in velocity allowing gases to be released from the wastewater.
   b. a decrease in velocity allowing organic and inorganic solids to settle out.
   c. a decrease in velocity which increases the treatment time of the inorganic solids.
   d. an increase in velocity which decreases the treatment time in the lines.

31. Sources of excessive clear water in a collection system include
   a. a problem at the wastewater treatment plant.
   b. an interceptor sewer leak.
   c. exfiltration from a high water table.
   d. infiltration from a high water table.
32. What items would you consider when selecting a solution to clear a stoppage in a sewer?
   a. adding a solution to the upstream manhole to clear the stoppage.
   b. cause of stoppage.
   c. time of day.
   d. staffing requirements.

33. With the completion of a sewer cleaning job, which of the following is not necessary to be done at the manhole?
   a. load the debris on the truck.
   b. sweep up the debris around the manhole.
   c. wash down street around work area and machines, making sure the wash water is broomed into the manhole.
   d. wash down truck.

34. Lift station failures include ______ failure.
   a. dip tube
   b. electrical circuit
   c. inverted siphon
   d. all of the above.

35. A pH of 7.0 is
   a. acid.
   b. alkaline.
   c. neutral.
   d. none of the above.

36. The interior of 300 feet of 12-inch pipe is uniformly coated with one inch of grease. How many gallons will this pipe hold when filled with water?
   a. 1230 gallons.
   b. 1360 gallons.
   c. 1470 gallons.
   d. 1630 gallons.

37. Infiltration is caused by
   a. cracked pipes.
   b. improper closed circuit TV operation.
   c. poor ventilation.
   d. all of the above.

38. The main reason for chlorinating wastewater in sewers is for _________ control.
   a. BOD
   b. odor
   c. pathogen
   d. suspended solids
39. The most important reason for washing hands thoroughly after taking a wastewater sample is to
   a. avoid being infected by pathogenic bacteria.
   b. avoid contaminating the BOD bottles.
   c. avoid smudging the BOD bottles.
   d. get the slime off your hands so you won't accidentally drop any glassware.

40. Roots can enter collection systems through
   a. air gaps.
   b. manhole covers.
   c. pipe cracks.
   d. all of the above.

41. Which of the following is a property of chlorine gas?
   a. can be compressed into liquid form.
   b. harmless to humans.
   c. highly flammable.
   d. lighter than air.

42. What is a mechanical means to remove material from a sewer?
   a. brushing.
   b. cutting.
   c. pumping.
   d. sweeping.

43. The purpose of a lift station sign-in log is to
   a. budget lift station visits.
   b. identify who makes changes in station operation.
   c. track employee movement for disciplinary actions.
   d. all of the above.

44. What tools are used with a power rodder?
   a. finger grips.
   b. pruning shears.
   c. spring blades.
   d. videotape camera.

45. The diameter of a wet well is 10 feet. If filled to a depth of 10 feet, it will contain approximately
   a. 2,987 gallons.
   b. 5,875 gallons.
   c. 6,024 gallons.
   d. 10,602 gallons.

46. Which one(s) of the following items should be inspected when responding to a lift station alarm at night?
   a. amount of screenings and other trash removal.
   b. motor control center and power panel.
   c. operation of gas masks.
   d. all of the above.
47. A pH of 6.0 is  
   a. acid.  
   b. alkaline.  
   c. neutral.  
   d. none of the above.

48. Tools used for sewer rodding include all but the  
   a. lag screw.  
   b. porcupine.  
   c. root saw.  
   d. square bar cork screw.

49. Areas subject to higher than normal vandalism are usually  
   a. along heavily traveled streets.  
   b. secluded, out-of-the-way buildings.  
   c. well-lighted, visible areas.  
   d. none of the above.

50. How does an emergency service crew try to remove a stoppage?  
   a. balling.  
   b. flushing.  
   c. hand rods.  
   d. parachutes.
Answers
Collection Study Guide
Class I

1. d
2. a
3. c
4. d
5. b
6. d
7. a
8. d
9. d
10. c
11. c
12. d
13. a
14. c
15. b
16. a
17. c
18. c
19. d
20. c
21. b
22. c
23. a
24. c
25. c
26. a
27. b
28. d
29. a
30. b
31. d
32. b
33. d
34. b
35. c
36. c
37. a
38. b
39. a
40. c
41. a
42. b
43. b
44. c
45. b
46. b
47. a
48. a
49. b
50. c