PRACTICE EXAM
GRADE I TREATMENT

The Division of Water Quality makes no claim as the accuracy of any answers provided herein.

October 2001
1. When organic wastes are discharged to receiving waters, oxygen is depleted by
   a. Algae during the day
   b. Bacteria
   c. Ducks
   d. Limestone rocks
2. Employee hazards include
   a. Noxious or toxic gases or vapors
   b. Oxygen deficiency
   c. Physical injuries
   d. All of the above
3. Hydrogen sulfide gives off an odor similar to
   a. Ammonia
   b. Chlorine gas
   c. Rotten eggs
   d. Decayed wood
4. Coliform bacteria are
   a. Algae
   b. Coagulant aids
   c. Indicators
   d. Sequestering agents
5. Three waterborne diseases are
   a. Mumps, measles, colds
   b. Scarlet fever, pneumonia, hay fever
   c. Typhoid fever, dysentery, cholera
   d. Tuberculosis, diphtheria, chickenpox
6. A cylindrical tank is 10 ft in diameter and 20 ft in height. What is the approximate capacity in liters?
   a. 44450
   b. 31030
   c. 5942
   d. 4445
7. Immediate first aid for burns is to
   a. Bandage tightly
   b. Cover liberally with a salve
   c. Immerse in warm water
   d. Flood with cold water
8. Which of the pH readings indicates an acidic wastewater?
   a. 3
   b. 7
   c. 9
   d. 12
9. If water weighs 8.34 lb/gal, how much will 7.5 gal weigh?
   a. 50.8 lb
   b. 62.5 lb
   c. 75.6 lb
   d. 77.3 lb

10. One mL is what fraction of a L?
    a. 1/10
    b. 1/100
    c. 1/1000
    d. 1/100 000

11. A possible cause of electric motor failure is
    a. Dirt
    b. Moisture
    c. Friction
    d. All of the above

12. Your pump ran continuously for 24 hours and delivered 288 000 gal. The capacity of the pump is ____ gpm.
    a. 100
    b. 200
    c. 1 000
    d. 12 000

13. Approximately how many gallons of wastewater would 600 ft of 6-in. pipe hold?
    a. 740
    b. 880
    c. 900
    d. 930

14. A water seal on a pump serves a dual purpose. It acts as a lubricant and it also
    a. Acts as a coolant to keep the pump bearing from overheating
    b. Keeps gritty material from entering the packing box
    c. Keeps the pump primed
    d. Is a reserve water supply

15. The elevation of any pump above the source of supply should not exceed ____ ft.
    a. 2.2
    b. 22
    c. 200
    d. 224

16. Friction in a pipeline causes
    a. Aeration
    b. Corrosion
    c. Loss of pressure
    d. Overheating
17. Before repairing a pump’s electrical circuit, which of the following actions should you take?
   a. Disconnect the circuit breaker, place a red tag stating “do not activate,” and lock out
   b. Notify your supervisor
   c. Tell all of the operators not to activate the circuit
   d. Turn the pump off

18. Pump maintenance includes
   a. Checking operating temperature of bearings
   b. Checking packing gland
   c. Operating two or more pumps of the same size alternatively to equalize wear
   d. All of the above

19. When routinely inspecting a centrifugal pump, it is noted by the operator that the bearings are excessively hot. This could be caused by
   a. Overlubrication
   b. Speed too slow
   c. Worn impeller
   d. Worn packing

20. In a centrifugal pump, internal leakage is prevented by
   a. Impellers
   b. Sleeves
   c. Volutes
   d. Wear rings

21. A valve that allows water to flow in one direction only is a ______ valve.
   a. Check
   b. Gate
   c. Globe
   d. Petcock

22. An outfall is
   a. A sewer line that drops to a lower level in a manhole
   b. A submain
   c. The line leaving the plant
   d. The main line that carries all of the wastewater to the plant

23. Centrifugal pump parts include a
   a. Diaphragm
   b. Impeller
   c. Piston
   d. Rotor

24. Which indicates a good quality domestic activated sludge?
   a. Black color and septic odor
   b. Brown color and musty odor
   c. Brown color and a lot of dark brown foam
   d. Light tan and light fluffy foam
25. Which of the following forms of plant life is necessary for the proper functioning of a stabilization or oxidation pond?
   a. Algae
   b. Cattails
   c. Water lilies
   d. Weeds

26. Cattails growing in a lagoon will
   a. Cause short circuiting in the affected lagoon
   b. Eliminate mosquito larvae
   c. Increase diurnal pH fluctuations
   d. Increase toxic blue-green algae concentrations in the effluent

27. At what time of day is the dissolved oxygen content highest in a facultative lagoon?
   a. 3 a.m.
   b. 7 a.m.
   c. 9 a.m.
   d. 3 p.m.

28. The greatest bacterial activity and the highest BOD₃ removal in a facultative lagoon will occur when there is
   a. Good sunlight, cold temperature, and strong wind
   b. Heavy overcast, warm temperature, and strong wind
   c. Good sunlight, cold temperature, and moderate breeze
   d. Good sunlight, warm temperature, and moderate breeze

29. Chlorine gas is
   a. Colorless
   b. Heavier than air
   c. Nontoxic
   d. Odorless

30. Acids should never be added to chlorine solutions because they
   a. Cause chlorine gas to be released
   b. Corrode or "eat away" the solution tank
   c. Decrease the disinfecting properties of chlorine
   d. Result in the formation of a chloride precipitate

31. As water temperatures decrease, the disinfecting action of chlorine
   a. Decreases
   b. Increases
   c. Remains the same

32. The highest concentration of algae growth in a facultative lagoon is usually observed
   a. Near middepth
   b. Near bottom
   c. Near top
   d. In the sludge layer
33. Which of the following is not a possible cause of short circuiting in a pond?
   a. Excessive weed growth
   b. High influent BOD
   c. Poor arrangement of inlet and outlet
   d. Irregular pond bottom

34. Common settling times in primary clarifiers range from
   a. 15 to 30 minutes
   b. 30 to 45 minutes
   c. 1 to 2 hours
   d. 2 to 3 hours

35. Which gas is produced in anaerobic digesters and can be used as a fuel?
   a. Propane
   b. Methane
   c. Ethane
   d. Carbon dioxide

36. Compute the lagoon’s detention time.
   Data: Surface area = 6.0 ac
   Average depth = 3.0 ft
   Average daily flow (influent) = 0.25 mgd
   1 ac (area) = 43,560 sq ft
   1 cu ft = 7.48 gal
   a. 3 days
   b. 8 days
   c. 24 days
   d. 29 days

37. How many pounds of chlorine gas are necessary to treat 4,000,000 gal of wastewater at a dosage of 2 mg/L?
   a. 61 lb
   b. 65 lb
   c. 67 lb
   d. 69 lb

38. Your wastewater treatment plant serves 1,100 people. The flow averages 80,000 gpd. The approximate daily flow contribution per person is
   a. 14 gpd/cap
   b. 73 gpd/cap
   c. 80 gpd/cap
   d. 140 gpd/cap

39. The rock in most trickling filters is placed
   a. Directly in the ground
   b. Directly in a concrete slab
   c. On system tile underdrains
   d. On a rubber tile floor
40. Chlorine is primarily used to
   a. Disinfect
   b. Prevent corrosion
   c. Raise pH
   d. Stabilize organics

41. What is the purpose of heating and mixing a primary anaerobic digester?
   a. To eliminate all oxygen present
   b. To increase the digestion rate
   c. To keep methane gas in suspension
   d. To prevent settling of grit on the bottom of the digester

42. The following device is used to measure the flow of wastewater:
   a. Comminutor
   b. Comparator
   c. Parshall flume
   d. Sluice gate

43. A spray nozzle on the mechanically cleaned screen has become plugged. To ensure your safety, before entering the screen housing to repair the nozzle, you should
   a. Leave a note on breaker panel of repair being made
   b. Request assistance for repair
   c. Turn off, lock out, and tag the motor control
   d. Turn off local control switch

44. Exhaust from a chlorinator room should be taken from
   a. Anywhere—the location is not important
   b. At floor level
   c. Close to the entrance
   d. In the ceiling

45. Which of the following would be the safest action to take in the event of a major chlorine container leak?
   a. Call the fire department
   b. Notify local police or sheriff
   c. Roll the container so that liquid rather than gas escapes
   d. Submerge the container in a basin or stream if feasible

46. A composite sample will give a(n)
   a. Even color
   b. High pH
   c. Instantaneous sample
   d. Representative long-term sample

47. Chlorine residual may be determined using the reagent
   a. Diethyl-p-phenylene diamine (DPD)
   b. Ethylene diamine tetraacetic acid (EDTA)
   c. Polychlorinated biphenyls (PCB)
   d. Sodium thiosulfate (Na$_2$S$_2$O$_3$)
50. Sources for more information and training courses are
   a. Federal, state, and local water pollution control agencies
   b. Libraries
   c. Local and national water pollution control associations
   d. All of the above
## TREATMENT I - ANSWERS

<table>
<thead>
<tr>
<th>Item #</th>
<th>Answer</th>
<th>Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>B</td>
<td>General</td>
</tr>
<tr>
<td>2</td>
<td>D</td>
<td>General</td>
</tr>
<tr>
<td>3</td>
<td>C</td>
<td>General</td>
</tr>
<tr>
<td>4</td>
<td>C</td>
<td>General</td>
</tr>
<tr>
<td>5</td>
<td>C</td>
<td>General</td>
</tr>
<tr>
<td>6</td>
<td>A</td>
<td>General</td>
</tr>
<tr>
<td>7</td>
<td>D</td>
<td>General</td>
</tr>
<tr>
<td>8</td>
<td>A</td>
<td>General</td>
</tr>
<tr>
<td>9</td>
<td>B</td>
<td>General</td>
</tr>
<tr>
<td>10</td>
<td>C</td>
<td>General</td>
</tr>
<tr>
<td>11</td>
<td>D</td>
<td>Support Systems</td>
</tr>
<tr>
<td>12</td>
<td>B</td>
<td>Support Systems</td>
</tr>
<tr>
<td>13</td>
<td>B</td>
<td>Support Systems</td>
</tr>
<tr>
<td>14</td>
<td>B</td>
<td>Support Systems</td>
</tr>
<tr>
<td>15</td>
<td>B</td>
<td>Support Systems</td>
</tr>
<tr>
<td>16</td>
<td>C</td>
<td>Support Systems</td>
</tr>
<tr>
<td>17</td>
<td>A</td>
<td>Support Systems</td>
</tr>
<tr>
<td>18</td>
<td>D</td>
<td>Support Systems</td>
</tr>
<tr>
<td>19</td>
<td>A</td>
<td>Support Systems</td>
</tr>
<tr>
<td>20</td>
<td>D</td>
<td>Support Systems</td>
</tr>
<tr>
<td>21</td>
<td>A</td>
<td>Support Systems</td>
</tr>
<tr>
<td>22</td>
<td>C</td>
<td>Support Systems</td>
</tr>
<tr>
<td>23</td>
<td>B</td>
<td>Support Systems</td>
</tr>
<tr>
<td>24</td>
<td>B</td>
<td>Unit Process/Process Control</td>
</tr>
<tr>
<td>25</td>
<td>A</td>
<td>Unit Process/Process Control</td>
</tr>
<tr>
<td>26</td>
<td>A</td>
<td>Unit Process/Process Control</td>
</tr>
<tr>
<td>27</td>
<td>D</td>
<td>Unit Process/Process Control</td>
</tr>
<tr>
<td>28</td>
<td>D</td>
<td>Unit Process/Process Control</td>
</tr>
<tr>
<td>29</td>
<td>B</td>
<td>Unit Process/Process Control</td>
</tr>
<tr>
<td>30</td>
<td>A</td>
<td>Unit Process/Process Control</td>
</tr>
<tr>
<td>31</td>
<td>A</td>
<td>Unit Process/Process Control</td>
</tr>
<tr>
<td>32</td>
<td>C</td>
<td>Unit Process/Process Control</td>
</tr>
<tr>
<td>33</td>
<td>B</td>
<td>Unit Process/Process Control</td>
</tr>
<tr>
<td>34</td>
<td>D</td>
<td>Unit Process/Process Control</td>
</tr>
<tr>
<td>35</td>
<td>B</td>
<td>Unit Process/Process Control</td>
</tr>
<tr>
<td>36</td>
<td>C</td>
<td>Unit Process/Process Control</td>
</tr>
<tr>
<td>37</td>
<td>C</td>
<td>Unit Process/Process Control</td>
</tr>
<tr>
<td>38</td>
<td>B</td>
<td>Unit Process/Process Control</td>
</tr>
<tr>
<td>39</td>
<td>C</td>
<td>Unit Process/Process Control</td>
</tr>
<tr>
<td>40</td>
<td>A</td>
<td>Unit Process/Process Control</td>
</tr>
<tr>
<td>41</td>
<td>B</td>
<td>Unit Process/Process Control</td>
</tr>
<tr>
<td>42</td>
<td>C</td>
<td>Unit Process/Process Control</td>
</tr>
<tr>
<td>43</td>
<td>C</td>
<td>Unit Process/Process Control</td>
</tr>
<tr>
<td>44</td>
<td>B</td>
<td>Unit Process/Process Control</td>
</tr>
<tr>
<td>45</td>
<td>A</td>
<td>Unit Process/Process Control</td>
</tr>
<tr>
<td>46</td>
<td>D</td>
<td>Unit Process/Process Control</td>
</tr>
<tr>
<td>47</td>
<td>A</td>
<td>Unit Process/Process Control</td>
</tr>
<tr>
<td>48</td>
<td>B</td>
<td>Unit Process/Process Control</td>
</tr>
<tr>
<td>49</td>
<td>A</td>
<td>Unit Process/Process Control</td>
</tr>
<tr>
<td>50</td>
<td>D</td>
<td>Technical Supervision/Management</td>
</tr>
</tbody>
</table>