WASTEWATER TREATMENT PLAN OPERATOR EXAMINATION

GRADE 4 STUDY GUIDE

The following is a general outline to serve as a study guide in preparing for the Grade 4 examination. All areas may not be covered on any one exam, nor does the outline necessarily include all topics, which may appear on an exam. The percentage value shown after each major heading give the approximate relative value of that area on the exam.

I. General Knowledge approx. 3%
   - A. Wastewater Characteristics
   - B. Mathematics
   - C. Overall Treatment

II. Preliminary & Primary Treatment approx. 3%
   - A. Troubleshooting
   - B. Operating Parameters
   - C. Calculations

III. Secondary Treatment approx. 30%
   - A. Process Concepts and Characteristics
   - B. Process Control
   - C. Testing
   - D. Operating Parameters
   - E. Calculations

IV. Solids Handling approx. 15%
   - A. Solids Handling Equipment
   - B. Dewatering Methods; Type, Applications
   - C. Calculations

V. Disinfection approx. 9%
   - A. Theory
   - B. Calculations

VI. Laboratory approx. 13%
   - A. Sampling
   - B. Laboratory Practices
   - C. Calculations
   - D. Test Procedures

VII. Maintenance approx. 7%
   - A. Pumps
   - B. Tools and Equipment

VIII. Safety approx. 5%

IX. Records and Management approx. 15%
   - A. Cost of Operation
   - B. Personnel
   - C. Overall Management

There are several publications available which are useful in preparing for the exam although you will not find it necessary to be familiar with all of them in order to do well on the test.

The Sacramento Course
Standard Methods Latest Edition
Water Pollution Control Federation Manuals Nos. 1, 4, 11, 16, 18, 20
The New York Manual
The Texas Manual
ABC Guide to the ABC Testing Services for Wastewater Collection Systems and Treatment Plant Operations – Volumes 1 and 2
DEM Computer-Assisted Training

These publications can be reviewed in the Office of Water Resources, RIDEM 235 Promenade Street, Providence, RI (401) 222-6820.

GRADE 4
Sample Questions

1. What is food/micro-organism-loading ration in an activated sludge plant with a flow of 1.0 M.G.D.? The average influent BOD is 210 mg/l, the average primary effluent percent removal for BOD is 33%, the aeration tank contains 250,000 gallons, and the mixed liquor suspended solids concentration is 2000 mg/l. Select the closest answer.
   A. 25 lbs BOD perday/100lbs MLSS
   B. 28 lbs BOD perday/100lbs MLSS
   C. 30 lbs BOD perday/100lbs MLSS
   D. 32 lbs BOD perday/100lbs MLSS
   E. 35 lbs BOD perday/100lbs MLSS

2. Digester gas may be used as a fuel when the methane content exceeds:
   A. 25%
   B. 35%
   C. 50%
   D. 65%
   E. 75%

3. Why must a positive displacement pump never be started against a closed valve?
   A. It will pump nothing
   B. Excessive pressure may damage the line, the pump, or the motor
   C. The sludge will spill
   D. the valve will swing open
   E. The power driver will stall and overheat

4. A constant weight of a glass fiber filter weighed 0.0934 grams. A 150 ml sample of wastewater was filtered, and after drying in an oven at 103 degrees C, the cooled glass river filter weighed 0.1068 grams. What was the concentration of total suspended solids?
   A. 63.3 mg/l
   B. 71.5 mg/l
   C. 81.8 mg/l
   D. 89.3 mg/l
   E. 94.6 mg/l

5. What should be the operating pressure on a water seal above the discharge pressure on a pump?
   A. 1-2 psi
   B. 2-3 psi
   C. 5-10 psi
   D. 15-25 psi

Answers: 1) B 2) D 3)B 4)D 5)C