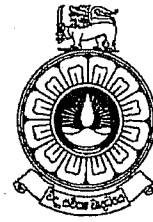


THE OPEN UNIVERSITY OF SRI LANKA
 Department of Civil Engineering
 Diploma in Technology - Level 4



CEX 4234- WATER SUPPLY AND SEWERAGE ENGINEERING
 CED 2206- PUBLIC HEALTH ENGINEERING

FINAL EXAMINATION - 2006/2007

Time Allowed: Three Hours

Index No.

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Date: 25th March, 2007

Time: 0930 - 1230

This paper consists of two sections, PART A and PART B.

Part A will get 25% of the total, while part B will get 75% of the total marks.

Please detach PART A and submit with your answer script separately at the end of the examination

PART A

You are advised to allocate 45 minutes for Part A

Answer all questions in the space provided.

1. BOD_5^{20} of a water sample of the Kirulapone Canal near by OUSL was 324 mg/l. If the reaction rate constants 0.21/day, what would be the 5 day BOD of this waste at 28°C?
 [Hint: $k=k_{20}\theta^{(T-20)}$; $BOD_5 = L_0(1 - e^{-kt})$; $\theta = 1.047$] (08 marks)

2. An aeration tank with a volume of 400 m³ contains a mixed liquor suspended solids concentration of 2500 mg/l. How many kilograms of mixed liquor suspended solids are in the tank? (06 marks)



3. Sewage fouling at an estuary on the west coast of Sri Lanka is a problem. What would be the remedial actions do you recommend to the above problem? (06 marks)
4. What is the difference between and 'screening and skimming' in sewer treatment? (05 marks)
5. A dosage of 30mg/l of alum is applied in treating water supply of 500MLD. How many kilograms of alum are applied per day. (06 marks)
6. Distinguish between dead end system and tree system. (06 marks)
7. Why do tower intakes in lakes and reservoirs have entry ports at different depths? (06 marks)



8. Why explosions are occur in the sewer lines and how they can be prevented?(06 marks)

9. What objections could be there if (i) turbidity (ii) chlorides (iii) hardness (iv) Fe and Mn present in excess in water. State the permissible levels of the above in drinking water.
(15 marks)

10. During sludge digestion, mixing is necessary. How mixing improves the digestion of sludge?
(06 marks)

Pick the best answer out of the given choices. (03 x 5 marks)

11. Storm sewers carry
- a. commercial and industrial wastewater
 - b. contaminated water
 - c. sanitary sewers
 - d. surface runoff
 - e. domestic sewers



12. Junction chambers

- a. are sewers to entering without excessive turbulence and head loss
- b. permit workmen to enter and clean the sewer lines
- c. locate at the head of the sewers
- d. are vertical openings in the road curbs
- e. carry sewer under the obstruction and regain the elevation

13. Generally depth of the grit chamber is

- a. 0.5m
- b. 1.0 m
- c. 1.5 m
- d. 3.0 m
- e. 8.0m

14. To improve solid removal in sedimentation tanks in wastewater treatment plant chemicals are added. Choice of chemical dosage is independent on

- a. cost of chemical
- b. degree of treatment required
- c. characteristic of water
- d. pH of wastewater
- e. chemical feeders

15. Which type of water meter is most suitable where there is considerable fluctuation rate of water flow?

- a. current meter
- b. compound meter
- c. displacement meter
- d. pressure differential meter
- e. proportional meter

Mention if the following statements are *true (T)* or *false (F)*. (03 x 5 marks)

- | | True | False |
|---|-------|-------|
| 16. Sewage contains only 0.1 percent solids, the rest is water. | | |
| 17. Nitrogen as well as Phosphorous are very essential nutrient for biological process. | | |
| 18. Leaping weir constructed along one of both sides of a combined sewer. | | |
| 19. Operation cost of trickling filter process is lower than activated sludge process. | | |
| 20. Volumetric Loading of activated sludge process varies within the range of 0.3 -0.7. | | |

