

[H 1136]

B.Sc./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2006.

Sixth Semester

Civil Engineering

CE 339 — ENVIRONMENTAL ENGINEERING — II

(INCLUDING DRAWING)

Time : Three hours

Maximum : 100 marks

Assume any data as necessary.

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is the role of flocculation? Where is it used?
2. What is theory of filtration?
3. What is the purpose of using velocity control device in a grit chamber?
4. How a primary settling tank is different from a secondary settling tank?
5. What are the advantages of floating aerator over fixed aerator?
6. List the demerits of septic tanks.
7. What are the properties of sludge?
8. What is sewage sickness? How can it be avoided?
9. What is meant by sludge conditioning?
10. What are the problems involved in disposal of sewage into ocean?

PART B — (5 × 16 = 80 marks)

11. (i) Design a septic tank for a hostel consisting of 150 students. Sewage flow generated is 120 litres per capita per day. De-sludging period is 1 year. Sludge digestion space required 35 lit/capita, scum storage space 10 lit/capita, length : width = 4 : 1
- (ii) Draw cross section of the septic tank with effluent disposal system from the septic tank.

12. (a) Design a rapid sand filter for a population of 80,000 persons. The capita demand is 120 lpcd. Peak demand 125% of average demand. Assume relevant rate of filtration and other data. Sketch the cross section of the rapid sand filter.

Or

- (b) Explain Zeolite process of water softening with chemical reactions. List out the merits and demerits of the process.

13. (a) Design a sedimentation tank for a sewage treatment plant for a town having a population 90,000. Sewage contribution is 120 litres/day/head. Assume any other data. Draw the cross section of sedimentation tank.

Or

- (b) Draw the flow diagram for activated sludge process, and explain the basic principles involved in the design of the process.

14. (a) Design a high rate trickling filter for an average flow of 15 m³/d. BOD of raw sewage is 300 mg/l. Draw the cross section of the trickling filter showing all details.

Or

- (b) Explain the methods, problems and limitations of land disposal of sewage.

15. (a) (i) Sketch and discuss the different zones of pollution in a stream. (8)
(ii) Describe the conditions favouring disposal by dilution. (8)

Or

- (b) Write short notes on :

(i) Defluoridation (6)

(ii) Oxygen sag curve (5)

(iii) Sludge digestion. (5)