B.E. / B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS NOV/DEC 2011
CIVIL ENGINEERING BRANCH
SIXTH SEMESTER (REGULATIONS 2004)

CE 384 – ENVIRONMENTAL ENGINEERING-II

Time: 3 hours Total Marks: 100

Instructions

(i) Part A carries a maximum of 20 marks and Part B carries a maximum of 80 marks
(ii) All questions in Part A carries 2 marks each and all question in Part B carries 16 marks each
(iii) Make suitable assumptions wherever necessary and state them clearly.

PART A (10X2 = 20 Marks)

1. How can disinfection improve drinking water quality?
2. Distinguish between discrete and flocculent settling.
3. What are the objectives of primary treatment of sewage?
4. What is the significance of F/M ratio in ASP design?
5. How do you determine hydraulic loading rate of a trickling filter?
6. What do you mean by algal-bacterial symbiosis?
7. Under what circumstances sewage by land treatment is suitable?
8. Give the difference between deoxygenation and reaeration with respect to oxygen sag curve.
9. Distinguish between thickening and dewatering of sludge.
10. Enumerate various methods of sludge disposal.

PART B (5X16 = 80 Marks)

11. i) Design a septic tank with dispersion pit for 225 users. The rate of water supply is 75 Lpcd. (10)

ii) Assuming suitable criteria design a grit chamber for a proposed STP expected to treat 60 ML/d maximum flow. (6)

12.a)i) Explain the different unit operations and processes involved in water treatment and their functions.

(OR)

b)i) Calculate average chlorine required per day to treat 120 ML/d of water. Also calculate the storage required for 60 days. Assume an average chlorine demand of 3.8 mg/L. (4)

ii) Describe with sketches different methods of iron and manganese removal from ground water. (12)

13.a)i) Define and differentiate between suspended and attached growth process. (4)

ii) Design a high rate trickling filter from the following data:

Design flow	:	60 ML/d
Recirculation ratio	:	1:2
BOD of primary treated sewage	:	270 mg/L
Desirable effluent BOD	:	20 mg/L

(12)

(OR)

b)i) Design an oxidation ditch for a design sewage flow of 50 ML/d. Assume suitable data wherever necessary. (8)

ii) Draw a neat sketch of a UASB reactor and explain the working principle. (8)

14.a)i) A town discharges 40 m^3/s of secondary treated sewage into a stream having a rate of flow 1000 m^3/s. The DO content of sewage is 1 mg/L and DO in upstream side of river is 8.5 mg/L. Find the DO of mix. (4)

ii) What do you mean by "Self purification" of stream? Draw a neat sketch of an oxygen sag curve and explain the salient features. (12)

(OR)

b) Explain the various methods of sewage application on land with the aid of suitable sketches. Also state advantages and disadvantages of sewage application on land.

15.a) With a neat sketch explain the principle and working of a high rate anaerobic sludge digester. State the effects of pH, temperature and VFA on sludge digestion.

(OR)

b)i) Explain the working principle of a sludge drying bed and give the design criteria. (6)

ii) Briefly describe the various methods of dewatering of sludge. (10)

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