



B.E DEGREE EXAMINATIONS: APRIL 2015

(Regulation 2009)

Sixth Semester

CIVIL ENGINEERING

CEE117:Environmental Engineering II

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Identify the correct statements using the code given below the statements.
 - i) Dry weather flow does not include the storm flow.
 - ii) Subsoil entry is included in the DWF.
 - iii) Sullage is not included in dry weather flow.
 - iv) Separate sewer carries DWF only.

a) ii, iii	b) i, ii, iv
c) i, iv	d) iii, iv
2. Relative stability of a wastewater, which took 5 days for disappearance of blue colour at 20⁰ C incubation, is

a) 18 %	b) 32 %
c) 92 %	d) 68 %
3. Reason for preferring modified forms of ASP than the conventional ASP is

a) improved efficiency	b) reducing detention time
c) reduction in O ₂ wastage	d) to take care of higher BOD
4. BOD loading rate adopted in the design of a stabilization pond (in kgBOD/ha.d) is

a) 100 – 450	b) 150 - 330
c) 0 – 350	d) 100 - 250
5. Anaerobic treatments are attractive and in general applied for waste water having minimum COD of

a) 1000 mg/l	b) 3000 mg/l
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PART C (5 x 14 = 70 Marks)

21. a) (i) Discuss the factors influencing the dry weather flow. (8)
(ii) Explain the procedure of laying of sewers for the desired slope and alignment. (6)

(OR)

- b) A town has a population of 1,00,000 persons and provides a water supply at the rate of 165 lpcd. Design a sewer running 0.7 times full. Take uniform value of $N = 0.013$. The sewer is to be laid at a slope of 1 in 400. Adopt a peak factor of 3. Do necessary checks for the satisfying of self-cleansing velocity conditions also.

22. a) (i) Explain the mechanism of biogas recovery and list out the factors influencing. (8)
(ii) Describe the working principle of an oxidation pond with an illustrative flow diagram of the process. (6)

(OR)

- b) Design a single-stage high rate trickling filter for the following data. Assume suitable data and do necessary check for your design.

Flow rate = 2.5 MLD

Recirculation ratio = 1.5

BOD of raw sewage = 270 mg/lit

BOD removal in PST = 35 %

BOD of final effluent required = 30 mg/lit

23. a) (i) Compare the conventional and high rate anaerobic systems. (7)
(ii) Describe the working principle and advantage of anaerobic sequencing batch reactor. (7)

(OR)

- b) Explain the working of an upflow anaerobic sludge blanket reactor and list out different design considerations of it.

24. a) (i) Explain the different zones of a polluted river with the help of the oxygen sag curve (8)
(ii) Make a note on recycle and reuse of waste effluents with suitable examples. (6)

(OR)

- b) (i) Primary sedimentation tank of a wastewater treatment plant treats 2.6 MLD of sewage having suspended solids of 1700 mg/lit and removes 85% of the SS with moisture content of 92% in the sludge. The solids are 35% volatile with a specific gravity of 1.05 and 65% nonvolatile with a specific gravity of 2.5. Determine the volume of the primary sludge collected. Also find the sludge volume after sludge digestion which reduces the volatile solids content by 60% and decreases water content to 88%. (8)
- (ii) What is sewage sickness? List out its effects and ways of avoiding it. (6)

25. a) (i) Discuss the quality requirements of a trap and describe the ways by which water seal loss occurs. (8)
- (ii) Give the general layout of drainage plan of a residential building showing various essential features. (6)

(OR)

- b) Explain the various plumbing systems with the neat sketches showing their components and connections. Also compare their advantages and disadvantages.
