PVP 20

Code: 20CE3401

II B.Tech - II Semester – Regular Examinations – JULY 2022

ENVIRONMENTAL ENGINEERING
(CIVIL ENGINEERING)

Duration: 3 hours Max. Marks: 70

Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.
2. All parts of Question must be answered in one place.

UNIT – I

1. a) List out the objectives of a water supply scheme and explain about fluctuations in demand. 5 M

   b) Compute the population after 6 decades from the last know decade using Arithmetical Increase, Geometrical Increase Method & Incremental Increase Method.

Year	1975	1985	1995	2005	2015
Population	35000	38000	44000	52000	67000

9 M

OR

2. a) Define per capita consumption. Explain the factors affecting per capita consumption. 7 M

   b) Discuss the relationship between alkalinity and hardness. Also mention the permissible and acceptable limits as per IS10500. 7 M

UNIT – II

3. a) Define coagulation. Explain how to determine the optimal dose of coagulant. 7 M

b) Define (i) disinfection (ii) primary disinfectant (iii) secondary disinfectant. Discuss the types and methods of chlorination. 7 M

OR

4. a) Write about Distribution systems & explain about Different methods of distribution systems. 7 M

b) Write short Notes on i) Sluice Valve ii) Air Valve iii) Check Valve. 7 M

UNIT-III

5. a) Design a concrete 2.5m dia sewer pipe of length 3000m for the sewage flow of 250m^3/s. Take manning's n value as 0.012 and the difference between datum points are 50m. 7 M

b) Explain the significance of C and N in wastewater. 7 M

OR

6. a) Explain BOD and COD. Derive the expression for ultimate BOD for a 't' day wastewater sample taking 'k' as rate constant and t is the duration. 7 M

b) BOD_1^{30} of domestic sewage has been found to be 150mg/L. What will be the BOD_5^{20}? Assume K = 0.12 (base 10) at 20^oC, and $\theta = 1.056$. 7 M

UNIT – IV

7. a) Explain about the ASP in detail. 8 M

b) Explain about Screens & the important of Different types of Screen. 6 M

OR

8. a) Differentiate between High rate and Conventional Tricking filters. 7 M

b) Briefly discuss the following

i. Sludge bulking

ii. Sludge volume index

iii. F/M ratio

iv. MLVSS 7 M

UNIT – V

9. a) Explain the construction and working principle of septic tank with a neat sketch. 7 M

b) Explain about the disposal by irrigation method with suitable examples. 7 M

OR

10. a) Design a septic tank for the given population of 150, with a flow rate of 120 lpcd for the duration of 10 years. Assume, the rate of sludge generation is 0.6kg/capita/day and sludge accumulation of $0.04m^3$. 8 M

b) Discuss briefly about the disposal by dilution method. 6 M