B.E.(Civil Engineering) Semester Third (C.B.S.)
Environmental Engineering - I

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Notes : 1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Assume suitable data wherever necessary.
9. Diagrams and chemical equations should be given whenever necessary.
10. Illustrate your answers whenever necessary with the help of neat sketches.
11. Use of non programmable calculator is permitted.

1. a) Explain the factor affecting per capita demand. **6**

    b) The data given below. Shows details of population of city from year 1970 to 2010. Calculate the population for the year 2020, 2030 & 2040 by Arithmetic Increase Method. **7**

Years	1970	1980	1990	2000	2010
Population	25000	28000	34000	42000	47000

OR

2. a) Explain the importance and necessity of public water supply scheme. **6**

    b) What is an Intake structure? List out the types of Intake structure and state requirements of a good Intake structure. **7**

3. a) List out the various pipe joints used in water supply scheme and explain socket and spigot joints. **6**

    b) Determine hydraulic gradient for a pipe of diameter 1.6 m carrying water at a rate of 2.40 m^3/s. Take f = 0.003 **7**

OR

4. a) Write a short note on Rising main with labeled diagram. **6**

    b) Compare the merits and demerits of reciprocal and centrifugal pump. **7**

5. a) Enlist the physical, chemical and bacteriological characteristics of water. Explain any one. **7**

    b) Draw a flow sheet of conventional water treatment plant and explain in brief function of each unit. **7**

OR

6.	a)	Design a cascade aerator for a capacity of 35 MLD. Assume suitable data with a neat sketch.	7
	b)	Write short note on various types of Coagulant.	7
7.	a)	Derive an equation for settling velocity of discrete particles freely falling in a sedimentation tank.	7
	b)	Design a rapid sand filter for a population of 1,00,000 to be served and per capita water supply 270 Lpcd. Assume suitable data.	7

OR

8.	a)	Draw neat sketch of Clariflocculator and explain its working.	7
	b)	Clarify the various filters and differentiate "Slow Sand Filter" and "Rapid Sand Filter".	7
9.	a)	What is disinfection? What are the various methods of disinfection? Explain any one.	6
	b)	Explain the mass curve method to find capacity of reservoir?	7

OR

10.	a)	Chlorine usage in the treatment of $25000 \text{ m}^3/\text{day}$ is 9 kg/day. The residual chlorine after 10 min contact is 0.2 mg/lit. Calculate the dosage in milligrams per litre and the chlorine demand of the water.	6
	b)	Explain the various methods used in leakage detection in water pipe line.	7
11.	a)	What is Solid Waste? Give the classification of Solid Waste with their sources. Explain in brief.	6
	b)	Write short note on "Collection methods" of solid waste.	7

OR

| 12. | a) | Explain Transfer station and also state the requirement of transportation vehicle. | 7 |
| | b) | What are the points to be considered while selecting the site for sanitary land fill? Explain. | 6 |

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