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B.E. (Civil Engineering) Eighth Semester (C.B.S.)

Elective-III : Water & Waste Water Treatment

P. Pages : 2 **NRJ/KW/17/4683**

Time : Three Hours * 0 2 4 3 * Max. Marks : 80

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 whenever necessary.
9. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) Draw a layout of conventional water Treatment plant and explain the significance of each unit. **6**

b) Design cascade aerator for a water treatment plant of a town having population 1.5 lakh and per capita demand of water 180 ℓPcd. **8**

OR

2. a) Explain site selection for water treatment plant. **6**

b) Explain two film theory of gas transfer. **6**

c) Enlist the types of aerator. **2**

3. a) Design a flash mixer for a design flow of 250m^3/day. **7**

b) Explain factors affecting coagulation and flocculation. **6**

OR

4. a) Design a clariflocculator for a design flow of 15 MLD. **13**

5. a) Distinguish between slow sand filter and Rapid sand filter. **6**

b) Design a rapid sand filter for 25 MLD. **8**

OR

6. a) Explain in detail disinfection action of chlorine. **7**

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b) Results of chlorine demand test on a raw water are given below. Determine the break point dosage and the chlorine demand. **7**

Sample No.	Chlorine dosage (mg/lit)	Residual Chlorine after 10 min. contact (mg/lit)
1	0.2	0.18
2	0.4	0.34
3	0.6	0.48
4	0.8	0.46
5	0.9	0.27
6	1.0	0.18
7	1.2	0.38
8	1.4	0.58
9	1.6	0.78

7. a) Find BOD rate constant and ultimate first stage BOD using 'Least Square Method' for following data. **7**

Time in days	2	4	6	8	10	12
BOD (mg/lit)	11	18	22	24	26	27

b) What is BOD? Draw BOD curve and explain various stages of BOD. Also state the significance of BOD. **6**

OR

8. a) What is "Oxygen Sag Curve" in stream pollution. Explain with sketch. **7**

b) Explain physical and Chemical characteristics of wastewater. **6**

9. a) Design a suitable grit chamber for the design flow of 10 MLD. **7**

b) Explain in brief conventional waste water treatment plant with neat sketch. **6**

OR

10. a) Design a suitable screen unit for the design flow of 12 MLD. **7**

b) Explain working of PST with neat sketch. **6**

11. a) What is activated sludge process? With the help of neat sketch explain its working. **6**

b) Explain the factors affecting anaerobic digestion. **4**

c) Explain in brief stabilization ponds. **3**

OR

12. Write notes on **any three.** **13**

1) Sludge digester.
2) Trickling filter
3) Aerated lagoons
4) Sludge volume index
5) Sludge drying Beds

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