Environmental Engineering – I

P. Pages : 2

Time : Three Hours

|||| *0981* ||||

TKN/KS/16/7297

Max. Marks : 80

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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. Due credit will be given to neatness and adequate dimensions.
9. Assume suitable data whenever necessary.
10. Diagrams and chemical equations should be given whenever necessary.
11. Illustrate your answers whenever necessary with the help of neat sketches
12. Use of non-programmable calculator is permitted.

1. a) What is per capita water Demand? Explain variations in water demand. **6**

b) In a town, it has been decided to provide 200 liters per head per day in the 21st century. Estimate the domestic water requirements of this town in the year AD 2000 by projecting the population of the town by the incremental increase Method from the data given below:- **7**

Year	Population.
1940	2,50,000
1950	4,80,500
1960	5,50,300
1970	6,38,600
1980	6,95,200

OR

2. a) Discuss the major objectives of water treatment what are the components of water supply scheme? **6**

b) What are intake structure? State the requirement of good intake suture. **7**

3. a) A colony with a population of 35000 is to be supplied water at average daily demand of 210 lpcd. Find the diameter of main to carry maximum daily flow at a velocity of 1.2 m/sec and pump working for 12 hours a day. find the total loss if pipe length is 3 km. Darcy friction factor, f =0.03 and minor losses 10 times velocity head. Maximum daily demand is 1.8 times average daily demand. find the power of the pump required to pump this quantity if pump efficiency is 70% the static lift is 30 m. **7**

b) With neat sketches explain the various types of pipe Joints used in C.I. pipes. **7**

OR

4. a) Explain the following with neat sketch **any two**. **6**

    i)   scour valve.
    ii) Spigot and socket joint.
    iii) Pressure Relief valve.

	b)	List out various types of pumps used in water supply scheme and explain working & the advantages and disadvantages of reciprocating pump.	**8**
5.	a)	Draw a flow sheet of conventional water treatment plant for surface water source and state function of each unit.	**6**
	b)	Design a cascade Aerator for a capacity 12 MLD. The velocity of inlet pipe is 1.20 m/sec. Draw neat sketch and assume suitable data.	**7**

OR

6.	a)	Explain the aims of aeration in water treatment. What are its limitations.	**6**
	b)	Write short note on 'Jar test'.	**7**
7.	a)	What is sedimentation? State and explain various factors affecting sedimentation.	**7**
	b)	State the difference between slow sand filter and rapid sand filter.	**7**

OR

8.	a)	Determine the dimensions of Rapid sand filter for 20MLD. Assume filtration rate is 5000lit/hr/m^2.	**6**
	b)	Write short note on **any two**. i) Operational problems in filter. ii) Inlet and outlet arrangement in sedimentation tank. iii) Criteria for selection of filter sand.	**8**
9.	a)	Chlorine usage in the treatment of 25000 m^3/day is 9kg/day. The residual chlorine after 10 minutes contact is 0.2 mg/ℓ. calculate the dosage in milligrams per litre and the chlorine demand of the water.	**5**
	b)	Write notes on **any two**. i) Leakage and detection in water distribution system. ii) Mass curve method for the determine of reservoir capacity. iii) Layouts of distribution system.	**8**

OR

10.	a)	Define disinfection. What are the requirements of a good disinfectant? Name the different types of disinfection.	**6**
	b)	Write short note on Break point chlorination.	**7**
11.	a)	What are the elements of solid waste management? Explain.	**6**
	b)	Explain Transfer station and also state the requirements of transportation vehicle.	**7**

OR

12.	a)	What is Municipal Solid Waste? Explain in brief the classification of solid waste with their sources of generation.	**6**
	b)	What are the different methods of disposal of municipal solid waste and explain any one.	**7**

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