B.E. Civil Engineering Fourth Semester

CE-402 - Environmental Engineering-I

P. Pages : 2 **GUG/W/18/1534**

Time : Three Hours * 1 2 0 8 * Max. Marks : 80

Notes : 1. All questions carry equal marks.
2. Answer **all** questions.
3. Due credit will be given to neatness and adequate dimensions.
4. Assume suitable data wherever necessary.
5. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Explain in detail with neat sketch types of intake structure. **8**

b) Explain in detail with neat sketch Infiltration Gallery. **8**

OR

2. a) Explain in brief various expression use to determine fire demand. **5**

b) State and explain various factors that affects the rate of demand. **5**

c) Following is the population data of the city available from post census record determine the population of the city in 2011 by Geometric increase method. **6**

Year	1931	1941	1951	1961	1971	1981	1991
Population	12000	16500	26800	41500	57500	68000	74100

3. a) Water has to be supplied to the town with one lakh population at the rate of 150 liter per capita per day from the river 1.8 km away the difference in elevation between the lowest water level in the sump and services reservoir is 36 meter. Determine the size of main and HP of pump required assume suitable data where necessary. **8**

b) State various types of joints generally used in cast iron pipe and explain any two in detail with neat sketch. **8**

OR

4. a) State explain in brief four principle method of laying out distribution system. **8**

b) Compare continuous and intermittent system of water supply. **4**

c) Write a note on distribution reservoir, where are they located. **4**

5. a) What are the common impurities found in natural source of water and explain their effect upon its quality. **7**

b) Explain significance of the following from the point of view of water quality criteria. **9**
i) Turbidity ii) Chlorides iii) Nitrates.

OR

6. a) Explain the significance of E-Coli in water analysis. **7**

b) Write a note on : **9**

i) Water born diseases.

ii) MPN

iii) pH value of water.

7. Design a circular plain sedimentation tank to remove alum floc from following data. **16**

i) Required output from tank - 300 m^3/m
ii) Water used in desludging - 2%
iii) Minimum size of alum floc to be removed = 0.8 mm
iv) Sp. gravity of alum floc = 1.002.
v) Expected removal efficiency of alum floc = 75%
vi) Assume performance of settling tank : very good (n = 1/8)
vii) Kinematic viscosity of water = 1.01×10^{-6} m^2/s.

OR

8. a) Explain with the help of diagram various method of aeration. **8**

b) State and explain various types of coagulant. **8**

9. Design completely a rapid sold filter for a town having total filtered water requirement of 5 million liters of water per day assume suitable data. **16**

OR

10. a) Chlorine usage in the treatment of 25,000 m^3/day is 6 kg/day. The residual chlorine after 10 minutes contact is 0.2 mg/liter calculate the dosage in milligram per liter and chlorine demand of the water. **6**

b) What are various forms of application of chlorine ? Write a note on hypo chlorination. **6**

c) Write a note on wash water trough's. **4**

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