CBCS SCHEME

USN | | | | | | | | | | 18CV46

Fourth Semester B.E. Degree Examination, Dec.2023/Jan.2024
Water Supply and Treatment Engineering

Time: 3 hrs. Max. Marks: 100

Note: ***Answer any FIVE full questions, choosing ONE full question from each module.***

Module-1

1 a. Explain the importance and need for protected water supply. **(10 Marks)**

b. Solve the problem using Geometric Increase method. Find the population in 2020 , 2030 and 2040. **(10 Marks)**

Year	1970	1980	1990	2000	2010
Population	1,01,000	1,10,000	1,22,000	1,36,000	1,53,000

OR

2 a. What is Peak factor? Explain the factors governing design period. **(10 Marks)**

b. What is Five demands? Mention the different formulas used to calculate five demands. **(10 Marks)**

Module-2

3 a. Briefly explain the objectives of water treatment and list the physical water quality characteristics. **(10 Marks)**

b. Discuss the complete sequence of water treatment with a flow diagram. **(10 Marks)**

OR

4 a. Briefly explain the membrane filter technique for bacteria logical examination of water. **(10 Marks)**

b. Write the permissible limits and effects of following water quality parameters according (IS10500 – 1991) :
i) pH ii) Hardness iii) Turbidity iv) Chloride v) Fluoride. **(10 Marks)**

Module-3

5 a. Define Sedimentation and Coagulation. List the common coagutents used and mention the factors affecting coagulants. **(10 Marks)**

b. About 15000m^3/day of water, flocculating particles were produced by coagulation and a column analysis indicates that an overflow rate of 20m/day will produce satisfactory at the depth of 3.5m. Determine the size of required settling tank. **(10 Marks)**

OR

6 a. Briefly explain the mechanism of filtration. **(10 Marks)**

b. Design the approximate dimensions of a set of rapid gravity filters for treating water required for a population of 50,000, the rate of water supply being 180ℓ/d/person. The filters are works to 5000 ℓ/hr/m^2. Assume necessary data. **(10 Marks)**

Module-4

7 a. Define Chlorination. Explain the various types of chlorination. **(10 Marks)**

b. Define Fluoridation and Defluoridation. Briefly explain Nalgonda technique **(10 Marks)**

OR

8 a. What is Softening of water? Discuss the Zeo – lite process of water softening with neat sketch. **(10 Marks)**

b. Discuss the characteristics of ideal disinfectants and explain the mechanism of disinfectant. **(10 Marks)**

Module-5

9 a. Briefly explain the necessity and factors for the selection of a pump. **(10 Marks)**

b. Determine the capacity of pump required for following data :
Population = 3 lakhs
Water level in the source = 100m
Daily demand of water = 140 ℓpcd
Level of treatment plant = 125m
Pumping hours = 24 hrs a day
Diameter of rising main = 90cm
Distance between source and treatment = 2km
Co-efficient of friction = 0.01. **(10 Marks)**

OR

10 a. With the help of neat sketch, discuss the Dead – End system and Radial system of water supply. **(10 Marks)**

b. Briefly explain the following :
i) Reflux valve ii) Fire hydrant. **(10 Marks)**

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