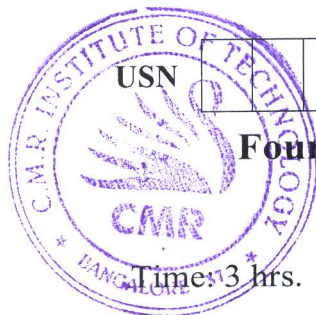


# CBCS SCHEME

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 bacteriological examination of water. (10 Marks)  
b. Write the permissible limits and effects of following water quality parameters according to (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 coagulants used and mention the factors affecting coagulants. (10 Marks)  
b. About 15000m<sup>3</sup>/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<sup>2</sup>. 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 : (10 Marks)
- i) Reflux valve                      ii) Fire hydrant.

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