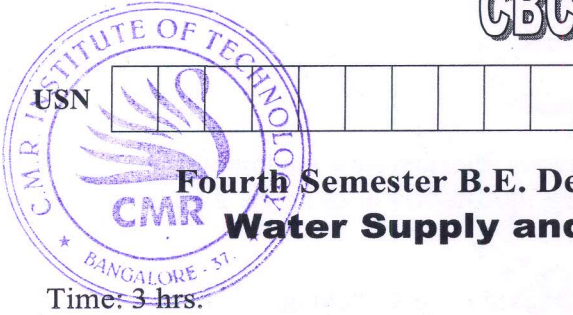


CBCS SCHEME



18CV46

Fourth Semester B.E. Degree Examination, Feb./Mar.2022 Water Supply and Treatment Engineering

Time: 3 hrs.

Max. Marks: 100

- Note:** 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Assume the missing data suitably.

Module-1

- 1 a. Explain the need of planned water supply scheme in present day community life. (08 Marks)
b. Discuss the factors affecting the rate of water demand. (04 Marks)
c. The population statistics of Malgudi town are given below:

Year	1980	1990	2000	2010	2020
Population	70,000	1,00,000	1,50,000	2,00,000	2,50,000

Estimate the expected population in the year 2030 by geometric increase and incremental increase method. (08 Marks)

OR

- 2 a. Explain the factors affecting the design period. (10 Marks)
b. A water supply scheme has to be designed for a city having a population of 5 lakh. Estimate the important kind of drafts which may be required to be recorded for an average water consumption of 225 l/head/day. Also record the required capacities of major components of proposed water supply systems. (10 Marks)

Module-2

- 3 a. Discuss the importance of physical, chemical and biological characteristics of water. (08 Marks)
b. Enumerate the factors considered for intake location and with neat sketch, explain the features of one type of river intake. (12 Marks)

OR

- 4 a. Write the BIS values (IS10500-2012) and Environmental significance of the following parameters,
(i) Colour
(ii) Turbidity
(iii) Nitrate
(iv) Hardness
(v) MPN. (10 Marks)
b. Explain the precautionary measures to be taken or considered while collecting the sample for water analysis. (10 Marks)

Module-3

- 5 a. Describe briefly the various constituents of coagulation-sedimentation tank. (12 Marks)
b. Design a rectangular sedimentation tank to treat 2.4 MLD of water. The detention period may be assumed to be 3 hr and velocity of flow as 15 cm/minute. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.

OR

- 6 a. Summarize the difference between Rapid gravity filter and slow sand filter. (10 Marks)
b. A filter unit is of $4\text{m} \times 8\text{m}$ size. After filtering $7000\text{ m}^3/\text{day}$ in 24 hr, the filter is back washed at the rate $12\text{ L/m}^2/\text{sec}$ for 5 min. Compute,
(i) The average filtration rate.
(ii) Quantity and percentage of treated water used in back washing.
(iii) The rate of wash water flow in each trough. The unit has 4 troughs. Assume that filter is closed for 30 minute every day for back washing aid cleaning. (10 Marks)

Module-4

- 7 a. Explain the mechanism of disinfection with requirements of ideal disinfectant. (10 Marks)
b. With stoichiometry, discuss the lime-soda method of water softening. (10 Marks)

OR

- 8 a. Explain briefly the following processors:
(i) Break point chlorination. (10 Marks)
(ii) Super chlorination. (10 Marks)
b. Describe briefly : (i) Defluoridation. (ii) Merits of Nano filtration. (10 Marks)

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- 9 a. With sketches, explain dead end system and grid iron system of distribution networks. (10 Marks)
b. Enumerate the pipe appurtenances used in water distribution system. Explain any two. (10 Marks)

OR

- 10 a. Discuss the types of storage reservoirs used. Explain any one. (10 Marks)
b. From a clear water reservoir 3 m deep and max. water level is at 30.00 RL. Water is to be pumped to an elevated reservoir at RL 75.00 at the constant rate of $9,00,000\text{ L/hr}$. The distance is 1500 m. Calculate the economical diameter of the rising main and the water horse power of the pump. Neglect minor losses and take $f = 0.01$. (10 Marks)
