CBCS SCHEME

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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)**

OR

6 a. Summarize the difference between Rapid gravity filter and slow sand filter. **(10 Marks)**

b. A filter unit is of 4m × 8m size. After filtering 7000 m^3/day in 24 hr, the filter is back washed at the rate 12 L/m^2/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.

(ii) Super chlorination. **(10 Marks)**

b. Describe briefly : (i) Defluoridation. (ii) Merits of Nano filtration. **(10 Marks)**

Module-5

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 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)**

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