

CBCS SCHEME

15CV64



Sixth Semester B.E. Degree Examination, Jan./Feb. 2021 Water Supply and Treatment Engineering

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Write the needs of protected water supply. (04 Marks)
- b. Explain various types of water demands. (06 Marks)
- c. Explain the factors affecting per capita demand. (06 Marks)

OR

- 2 a. Mention the methods of forecasting population and explain any two of them. (08 Marks)
- b. Write the factors considered for the design period. (04 Marks)
- c. Compare the population of the year 2000 and 2006 for a city whose population in the year 1930 was 25000 and in the year 1970 was 47000 by Geometric Increase method. (04 Marks)

Module-2

- 3 a. Write the objectives of water treatment. (04 Marks)
- b. With the help of treatment flow chart, write the significance of each unit. (08 Marks)
- c. Write the sources and characteristics of surface sources and subsurface sources of water with regard to quality and quantity. (04 Marks)

OR

- 4 a. Define Sampling of water and explain methods of sampling. (08 Marks)
- b. Write the BIS for following water quality parameters and write their significance :
i) Nitrate ii) Fluoride iii) Iron iv) E-Coli. (08 Marks)

Module-3

- 5 a. Briefly explain types of settling or sedimentation. (06 Marks)
- b. Define Coagulation and Flocculation in water treatment process. (04 Marks)
- c. The maximum daily demand at a water treatment plant was 12 million liter per day. Design the dimensions of a suitable rectangular sedimentation tank for the raw supplies, assuming detention time of 6 hours and velocity of flow as 20cm per minute. (06 Marks)

OR

- 6 a. Explain four mechanism of filtration used in filtration of water. (06 Marks)
- b. With the help of sketch, explain working of Rapid Sand gravity filter. (06 Marks)
- c. Design a Rapid sand filter unit without under drainage system for 4 MLD of water supply by assuming 4% of filtered water is required for washing of filter every day. (04 Marks)

Module-4

- 7 a. Define softening of water. Explain Lime soda process and Zeolite process of water softening with equation. (08 Marks)
- b. Explain the following process : i) Reverse osmosis ii) Nano - filtration. (08 Marks)

1 of 2

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

- 8 a. Explain different methods of disinfection with their merits and demerits. (08 Marks)
b. Define Fluoridation and Defluoridation design of water and explain the Nalgonda technique of Defluoridation process. (08 Marks)

Module-5

- 9 a. Write the function of intake structures and write the factors governing the location of intake. (08 Marks)
b. With the help of neat sketch, explain twin well type of River intake structure. (08 Marks)

OR

- 10 a. Explain Economical diameter of Raising mains. (04 Marks)
b. Water has to be supplied to a town with one lakh population at a rate of 150 Lpcd from a river 2000m away. The difference in elevation between the lowest water level in the sump and the reservoir is 36mt. If the demand has to be supplied in 8 hours, determine the size of the main and the BHP of the pump required. Assume maximum demand as 1.5 times the average demand. Assume $f = 0.0075$, Velocity in the pipe 2.4m/sec and efficiency of pump 80 percent. (06 Marks)
c. Briefly explain different methods of Distribution of water. (06 Marks)


