



CBCS SCHEME

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17CV64

Sixth Semester B.E. Degree Examination, Jan./Feb. 2021

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 to a community. (06 Marks)
b. Explain briefly different types of water demand. (06 Marks)
c. Discuss on the factors affecting per capita demand of water and design period. (08 Marks)

OR

- 2 a. Explain geometrical and incremental increase methods of population forecasting. (10 Marks)
b. The following population data is available a town. Estimate the probable population in the year 2051 by arithmetic and incremental increase method.

Year	1981	1991	2001	2011
Population	80,000	1,20,000	1,68,000	2,28,000

(10 Marks)

Module-2

- 3 a. Discuss on the objectives of water treatment. (05 Marks)
b. Explain the physical water quality characteristics. (05 Marks)
c. Discuss the effect of excess concentration of nitrate fluoride and hardness in drinking water (10 Marks)

OR

- 4 a. Explain the objectives of water quality management. (06 Marks)
b. Discuss on objective of water sampling and preservative techniques. (06 Marks)
c. Explain briefly physical, chemical and biological water quality characteristics. (08 Marks)

Module-3

- 5 a. Discuss on surface flow rate and detention period for a sedimentation tank. (05 Marks)
b. Explain briefly the various constituents of coagulation sedimentation tank. (05 Marks)
c. Find an area and number of units required for rapid sand filtration to serve a population of 2,00,000. Take average rate of demand = 160Lpcd and the maximum demand as 1.8times. Rate of filtration = $5\text{m}^3/\text{m}^2/\text{hr}$. Size of each filter = $10\text{m} \times 5\text{m}$. (10 Marks)

OR

- 6 a. Explain briefly the mechanism of filtration. (05 Marks)
b. Explain the working principle of a rapid filter with a neat sketch. (05 Marks)
c. Design a set of circular setting tanks to treat 5 million litres of water per day. Detention period may be taken as 2 hours. Calculate overflow rate and weir loading. (10 Marks)

Module-4

- 7 a. Discuss on the requirement of good disinfectant. (05 Marks)
b. Explain the objectives of water softening. (05 Marks)
c. Estimate the quality of Zeolite required to soften 2MLD of water with hardness 360mg/litre, which should be reduced to 60mg/liter. The interval between successive regeneration is 4 hours and the capacity of exchanger is 24000 gram/cu.m. (10 Marks)

OR

- 8 a. Enumerate the treatment of swimming pool water. (05 Marks)
b. Explain the theory of chlorination of water with chemical equations. (05 Marks)
c. A hostel having 500 students used well water for drinking. The rate of water supply is 120Lpcd. The water is to be disinfected using bleaching powder containing 25% chlorine available. Determine the monthly requirement of bleaching powder with the following :
data : i) Chlorine demand of well water = 1.2mg/litre
ii) Residual chloride expected = 0.2mg/litre (10 Marks)

Module-5

- 9 a. Discuss the factors governing the selection of source of water for water supply scheme. (05 Marks)
b. Discuss on pumps and Their types briefly. (05 Marks)
c. To supply water for a town water is pumped from a river 3km away into a reservoir. The maximum difference of levels of water in river and the reservoir is 20m. The population of a town is 50000 and per capita demand is 120 L/d. If pumps are to operate for a total of 8hrs and the efficiency of pumps is 80%, determine the horse power of the pumps. Assume average daily demand as 1.5 times the average, $f' = 0.03$ and $V = 2\text{m/sec}$. (10 Marks)

OR

- 10 a. Explain the service reservoir with a neat sketch. (10 Marks)
b. Explain various methods of water distribution system. (05 Marks)
c. Illustrate the advantages and disadvantages of water distribution system. (05 Marks)

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