CBCS SCHEME

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15CV64

Sixth Semester B.E. Degree Examination, Aug./Sept.2020
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. ***Draw neat sketches wherever necessary.***

Module-1

1 a. Discuss the need for a protected water supply. **(06 Marks)**

b. List the various types of water demand and explain any four only. **(10 Marks)**

OR

2 a. Explain the term "Design Period" and factors affecting the same. **(06 Marks)**

b. The census record of a town shown population of 50000 , 110000 and 160000 for the years 1971, 1991, 2011 respectively. Estimate
i) Saturation population and
ii) Expected population in 2031. Use Logistic curve method. **(06 Marks)**

c. Explain the term variations in demand of water. **(04 Marks)**

Module-2

3 a. Draw a neat treatment flow chart for a river source drawn from a balancing reservoir and explain the significance of each unit operation or process. **(10 Marks)**

b. Explain the term surface and sub – surface sources. **(06 Marks)**

OR

4 a. Explain the grab sampling and composite sampling techniques for water. **(04 Marks)**

b. Discuss the terms Palatability and Wholesomeness of water. **(04 Marks)**

c. Give the permissible limits (as per IS 10500 : 1991) and ill effects caused if exceeded (for any eight parameters only) in water used for drinking purpose. **(08 Marks)**

Module-3

5 a. Explain the term plain sedimentation and sedimentation aided with coagulation. **(08 Marks)**

b. A settling tank with a continuous flow regime is 3m deep and 60m long. Determine the velocity of water to be maintained for effective removal of particles for the following data :
Diameter of particle = 0.025mm ; Sp. gr. Of particles = 2.65 ;
Kinematic viscosity of water at $25^0C = 0.01\ cm^2/sec$. **(08 Marks)**

OR

6 a. Explain the theory of Filtration. **(04 Marks)**

b. Discuss the types of filters used and their classification. **(06 Marks)**

c. Design a rapid sand filter unit for 4 MLD water supply.
Assume 4% filtered water for washing every day.
Rate of filtration = 5000 litres/hr/m^2.
Length of filter bed = 1.5 × width.
30 minutes are lost every day for washing filter. **(06 Marks)**

Module-4

7 a. Give the comparison between Lime soda process and Zeolite process of softening water. **(10 Marks)**

b. Explain briefly with a neat sketch, the principle showing Reverse Osmosis. **(06 Marks)**

OR

8 a. Discuss the emphasis on treatment of water for community bathing during a fair. **(06 Marks)**

b. Explain briefly available technologies for Defluoridation of water. **(06 Marks)**

c. Write a note on waterborne diseases and their prevention. **(04 Marks)**

Module-5

9 a. Define the term intake structures and illustrate with neat sketches river intake. **(06 Marks)**

b. Obtain the size of the "Main" and BHP of pump required for following data :
Population of Town = One Lakh ; Per capita demand = 150 Lpcd ;
Length of pipe = 1800 m ; RL of sump = 100.00 ;
RL of service reservoir = 136.00 ; Maximum demand = 1.8 × Average demand
Working hour of pumps = 12 hours ; Flow velocity, through pipe = 1.5 m/s
Hazen William's coefficient = C_H = 120 for material of pipe. **(10 Marks)**

OR

10 a. Explain the different pipe materials used in water supply scheme along with advantages and disadvantages. **(08 Marks)**

b. Explain methods of Distribution system. **(08 Marks)**

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