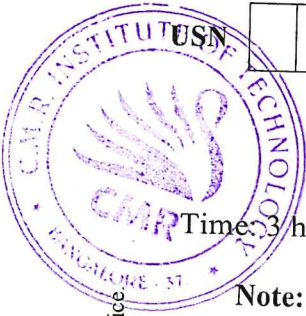


CBCS SCHEME

15CV64



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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°C = 0.01 cm²/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/m².
Length of filter bed = 1.5 × width.
30 minutes are lost every day for washing filter. (06 Marks)

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(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 = $1.8 \times$ 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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