06/06/23 - AN

Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 50618

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2023.

Fourth/Fifth Semester

Civil Engineering

EN 8491 — WATER SUPPLY ENGINEERING

(Common to Environmental Engineering)

(Regulations 2017)

Time : Three hours | Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define 'Per Capita Demand'.
2. Distinguish 'Acceptable value' and 'Permissible value' in drinking water standards.
3. List any four factors governing the location of the intake.
4. Define 'Scouring Velocity'.
5. Define 'Stoke's law'.
6. List any four types of chlorination.
7. Distinguish 'Absorptions and Adsorption'.
8. Brief about MBR process.
9. Recall the water pressure to be made available at the house service connection.
10. List any four pipe fixtures and fittings used in buildings.

PART B — (5 × 13 = 65 marks)

11. (a) Calculate the water requirement at the 60th year for a city having growth following logistic curve with the following data. Population at t=0 year is 35000, Population at the 20th year = 180000, Population at the 40th year is = 340000. Assume per capita water requirement as per CPHEEO standards. (13)

Or

(b) Explain the important characteristics of surface water and ground water. (13)

12. (a) Describe the function of intake structure, and construction of any two intakes. (13)

Or

(b) Illustrate the types of water distribution networks and its suitability with a neat sketch. (13)

13. (a) By applying the principle of sedimentation calculate the detention time, average flow velocity and overflow rate of a sedimentation tank having a size of 5m wide, 16m long, 3m water depth. (13)

Or

(b) Compare and contrast 'slow sand' and 'rapid sand filter'. (13)

14. (a) Discuss the types of hardness and describe any two technology used to remove hardness. (13)

Or

(b) Explain any one method of defluoridation, and Iron and Manganese removal. (13)

15. (a) Describe the requirements of water distribution network and explain its components. (13)

Or

(b) Explain the systems and types of plumbing. (13)

PART C — (1 × 15 = 15 marks)

16. (a) Illustrate a conventional water treatment system with a flow chart and explain the purpose of each. (15)

Or

(b) Calculate the size of a conveying main by any two methods to transport water from the source to a city, situated at a distance of 10km away with a loss of head of 20m. The maximum daily demand for water is 90 MLD with a schedule pumping hours of 16 in a day. Take coefficient of friction as 0.012 for Weisbach model and C_H=130 for Hazen's formula. Assume coefficient for any other methods if used to solve. (15)

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