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

Question Paper Code : 90233

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019
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. What are the objectives of a water supply scheme ?
3. Compare Wet intake tower and Dry intake tower.
4. Mention the importance of check valves in water supply pipeline.
5. Define Coagulation.
6. List the different methods of disinfection.
7. List the different membrane classification in MBR.
8. List the major advantages of zeolite process.
9. Define Goose neck in water pipe connection.
10. List the different methods of distribution.

PART – B **(5×13=65 Marks)**

11. a) Enumerate the common physical and chemical test that should be carried out in the examination of water and explain their significance. **(13)**

(OR)

b) The population for five decade from 1970 to 2010 are given below. Find out the population after one, two and three decades beyond the last known decade by using geometric increase method. **(13)**

Year	1970	1980	1990	2000	2010
Population	25000	28000	34000	42000	47000

12. a) Define intakes and mention the factors governing the location of intake structures and explain canal intake structures with neat diagram. **(13)**

(OR)

b) What are the various types of pipe materials used in water transmission ? How do you select pipes for transmission ? List the different types of pipe joints. **(13)**

13. a) Design a rapid sand filter to treat 10 million litres of raw water per day allowing 0.5% of filtered water for back washing. Half hour per day is used for back washing. The filters are rated to work 5000L/hour/sq.m. Assume suitable data. **(13)**

(OR)

b) Define chlorination. Why chlorination is necessary ? Discuss the types of chlorination. **(13)**

14. a) Describe the lime soda process for water softening with a neat sketch. **(13)**

(OR)

b) i) Why iron and manganese removal is required during water treatment ? **(4)**

ii) Discuss the different methods of deflouridation. **(9)**

15. a) i) Explain the different methods for detection of leaks in water distribution system. **(9)**

ii) Discuss the requirement of a good distribution system. **(4)**

(OR)

b) Illustrate with neat sketches the different layouts of distribution networks and also compare their merits and demerits. **(13)**

PART – C **(1×15=15 Marks)**

16. a) In a water supply scheme to be designed for serving a population of 4 lakhs, the storage reservoir is situated at 8Km away from the city and the loss of head from the source to the city is 16 metres. Calculate the size of the supply main using weisbach formula assuming a maximum daily demand of 200L/D/capita and half of the daily supply to be pumped in 8 hours. Assume coefficient of friction as 0.012. **(15)**

(OR)

b) In two periods each of 20 years a city has grown from 30000 to 170000 and then to 300000. Determine the saturation population, the equation of the logistic curve and expected population after next 20 years. **(15)**