**Printed Pages: 02**                                    **Subject Code: NCE 503**

**Paper Id:** | 100503 |                    **Roll No:** | | | | | | | | | |

# B TECH
## (SEM - V) THEORY EXAMINATION 2018-19
## ENVIRONMENTAL ENGINEERING -I

*Time: 3 Hours*                                          *Total Marks: 100*

**Note:** Attempt all Sections. If require any missing data then choose suitably.

### SECTION A

1. **Attempt all questions in brief.**                   **2 x 10 = 20**

   a. What is a design period?
   b. Write the name of common impurities found in water.
   c. Name the different pipe appurtenances.
   d. What are different methods for the detection of leakage of water?
   e. Differentiate between the continuous and intermittent system of water.
   f. State the principles of designing the pipe lines.
   g. What is an object of drop manhole?
   h. State the principles of sanitation.
   i. Mention the various aspects you would keep in view when designing a sewer.
   j. What do you understand by limiting velocity in sewers?

### SECTION B

2. **Attempt any *three* of the following:**             **10 x 3 = 30**

   a. What are the various methods to forecast the population growth in an area? Explain suitability of any four methods.
   b. A storage reservoir is situated at a distance of 6 km from a city of 3 lakh population. The total loss of head from the source to the city is not exceed 20 m. taking the daily demand of 200 l/capita/day, pumping is to be done for 12 hours only, determine the size of supply main by
      i. Darcy – Weisbach formula taking coefficient of friction as 0.015
      ii. Hazen Williams formula taking C = 130. Assume minor losses = $10 V^2/2g$.
   c. Describe the various methods of distribution of water and discuss the advantages and disadvantages of each.
   d. Discuss the various steps involved in the design of a distribution system. What precautions should be taken to make design economical?
   e. Explain the term sewer appurtenances. Why are sewer appurtenances necessary for a sewer line? Explain with neat sketches the working of any two sewer appurtenances that are usually provided on the sewer line.

### SECTION C

3. **Attempt any *one* part of the following:**          **10 x 1 = 10**

   (a) What do you mean by air pollution? Write the causes, effect and prevention of air population.
   (b) Write a note on various shapes of sewer sections.
       A stone-ware sewer, 30 cm in diameter is laid at a gradient of 1 in 100. Using N = 0.013 in manning's formula, calculate the velocity and discharge when sewer is running full.

4. **Attempt any** *one* **part of the following:**                    **10 x 1 = 10**

   (a) What do you understand by ventilation of sewer? Why and how it is provided in sewer line? Describe the various methods employed for the ventilation of sewers/

   (b) Differentiate between
     i.   Inlet and catch basin
     ii.  Manholes and lamp holes
     iii. Siphon and inverted shiphons.

5. **Attempt any** *one* **part of the following:**                    **10 x 1 = 10**

   (a) Over the two periods, each of 20 years population of a town increased from 30000 to 170000 to 300000. Find
     i.   Saturation population
     ii.  Coefficients of logistic equation
     iii. Expected population in next 20 years

   (b) What do you understand by per capita demand? How is per capita demand for a community estimated? Also explain the factors which affect the per capita demand.

6. **Attempt any** *one* **part of the following:**                    **10 x 1 = 10**

   (a) What is meant by 'water hammer' and how it is produced in pipes conveying water under pressure? What precautions should be taken and arrangements made to reduce its effects?

   (b) What are gravity and pressure conduits? Why pressure conduits are most commonly used for conveying water from distant sources to the town for supply?

7. **Attempt any** *one* **part of the following:**                    **10 x 1 = 10**

   (a) Write short note on the following:
     i.   Requirements of a good distribution system
     ii.  Hardy cross method

   (b) Compare the merits and demerits of the 'continuous' and 'intermittent' systems of water supply. Under what conditions would you recommend the use of the latter? Write a note on the prevention of wastage of water in the distribution system.