Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐

Total No. of Questions: 09　　　　　　　　　　　　　　　Total No. of Pages: 02

B. Tech. (CE)(Sem.5)
ENVIRONMENTAL ENGINEERING-I
Subject Code: BTCE-505
Paper ID: A2082

Time: 3 Hrs.　　　　　　　　　　　　　　　　　　　　　　Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. **Section A is COMPULSORY consisting of TEN Questions carrying TWO marks each.**

2. **Section B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**

3. **Section C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION A

1. **Write briefly:**

   a) What is the efficiency of the pump?

   b) Name the methods of removing permanent hardness from water.

   c) What is characteristics curve?

   d) Differentiate between slow sand filter and pressure filter.

   e) Name two physical water quality parameters and their importance in drinking water.

   f) What is air valve? Where is it applied?

   g) What is flocculation?

   h) Name two criteria for selection of pump.

   i) List two advantages of rotary pump.

   j) What are the methods for disinfection of water?

SECTION B

2. List the minimum domestic water consumption with detail break ups for (i) Indian towns and Cities and (ii) weaker sections and LIG colonies in small towns and cities as per IS code.

3. Determine the population of a town in year 2030 from the following data using incremental increase Method:

Year	1970	1980	1990	2000	2010
Population	25,000	28,000	34,000	42,000	47,000

4. What are the various factors need to be considered for selection of water supply sources.

5. Discuss the functions and types of distribution reservoir.

6. Calculate the requirement of lime and soda for cold softening of 2, 00,000 liters of raw water. The Water has following constituents:

Dissolved CO_2 = 39.6 mg/ l; Ca++= 44 mg/ l; Mg++= 18 mg/ l; Na+= 16 mg/ l; alkalinity (Bicarbonate)= 122 mg/l.

SECTION C

7. Write short notes on: (i) infiltration gallery with neat figure and (ii) Slow sand filter.

8. A pump is to deliver water from an underground tank against a static head of 40 meter. The suction Pipe is 50 m long and is 25 cm diameter. With Darcy-Weisbach friction factor f = 0.02. The delivery pipe is of 20 cm diameter and 1600 m long with friction factor of 0.022. The pump Characteristics can be expressed as: $Hp = 100 - 6000Q^2$ (where, Hp = Pump head in meters, and Q = discharge in m^3/ s). Calculate the head and discharge of the pump.

9. Write short notes on:

(i) Low cost treatment units in rural area;

(ii) Water supply network design