Roll No. Total No. of Pages : 02

Total No. of Questions: 09

B.Tech.(CE) (2011 Onwards) (Sem.-5) ENVIRONMENTAL ENGINEERING-I

Subject Code: BTCE-505 Paper ID: [A2082]

Time: 3 Hrs. Max. Marks: 60

INSTRUCTION TO CANDIDATES:

- 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) Define per capita demand. How is it useful in water supply scheme planning?
- b) Differentiate between shallow and deep wells. Compare the two from the quantity and quality point of view.
- c) What are intakes? What are the essential components of an intake structure?
- d) Derive the basic equation to find out the break horse power (BHP) of the pump required to pump water at rate of Q m³/s against a dynamic head of H m.
- e) "Although conductivity does not have a water quality standard, it is considered as a parameter to assess water quality". Why?
- f) Differentiate between available head and residual head.
- g) What is coagulation? What is the action of coagulants when added to raw water?
- h) What is the biological purification mechanism involved in a slow sand filter?
- i) Calculate the amount of bleaching powder of 30 percent available chlorine to be used to disinfect a flow of 3 lakh litres/d at a chlorine dose of 1 mg/L.
- j) What is the basic principle in the base-exchange process of water softening?

SECTION-B

- 2. Discuss about:
 - i) Slow sand filtration
 - ii) Disinfection of water
- 3. A 30 cm gravity well is being pumped at a rate of 1,200 lpm. Measurements made in nearby test wells 5 m and 25 m away yielded drawdown 4.5 m and 1.0 m, respectively. The distance of the water table above the bottom of the well is 80 m. Determine (i) the drawdown in the well during pumping (ii) the specific yield of the well.
- 4. List the suitability and criteria for choosing different types of pumps used in water supply pumps.
- 5. What are the factors which induce corrosion of water supply pipes? Discuss the various corrective treatments to prevent it.
- 6. Clearly differentiate between continuous and intermittent supply systems of water. Compare the merits and demerits.

SECTION-C

- 7. What is a balancing tank? State its importance in the distribution system. Explain how the capacity of a balancing tank is determined, when pumping is done between 6 am and 6 pm, using mass curve method.
- 8. a) What are the common impurities found in natural water and explain its effect on the quality?
 - b) Distinguish clearly between water quality criteria and standards. Critically examine the use of MPN as bacteriological water quality standard.
- 9. Write notes on:
 - i) Infiltration galleries and wells
 - ii) Economical diameter of rising mains