

[This question paper contains 3 printed pages.]

Your Roll No. ....

**3321**

**J**

**B.Tech.(C)/III**

Paper—ECE-304

**ENVIRONMENTAL ENGINEERING**

*Time : 3 Hours*

*Maximum Marks : 70*

*(Write your Roll No. on the top immediately  
on receipt of this question paper.)*

*Question No. 1 is compulsory  
and answer any five questions from the remaining.*

1. (a) Between Incremental Increase method of Estimating Population and Geometric method, which one gives better results? Why?
- (b) The per capita fire demand is generally ignored while computing the total per capita water requirement of a city.
- (c) Maximum hourly consumption of water of the maximum day is "Peak demand"? Discuss.
- (d) Differentiate between Hydrograph and Flow mass curve.
- (e) "Economic Height of a Dam". Explain.
- (f) Differentiate between Artesian and Non-Artesian aquifer.

[P. T. O.]

- (g) Differentiate Type I and Type II settling?
- (h) Is the quality of water purified through Rapid sand filter better than Slow sand filter? Discuss.
- (i) Does double chlorination always yield better results? Discuss.
- (j) Out of Radial system and Ring system of water distribution net work, which one is preferable? Why?

10×2=20

2. A town with a population of one lakh is to be supplied with water daily at a rate of 180 litre per capita per day. The variation in demand is as follows :

|              |   |              |
|--------------|---|--------------|
| 6 AM to 9 AM | — | 40% of total |
| 9 AM to 3 PM | — | 20% of total |
| 3 PM to 6 PM | — | 15% of total |
| 6 PM to 9 PM | — | 25% of total |

Determine the capacity of reservoir assuming pumping at a uniform rate from 6 AM to 5 PM. 10

3. Design a rectangular sedimentation tank, to treat 4,000 m<sup>3</sup>/day of coagulated water. Make necessary assumptions. Sketch the inlet, outlet and sludge removal arrangements.

10

4. (a) Discuss the "Logistic Curve Method" for determining the future population of a locality. Dervie a standard equation for such a curve. 5

- (b) In two periods each of 20 years, a city has grown from 50,000 to 1,80,000 and then 3,00,000. Determine :
- (i) the saturation population, and
  - (ii) the expected population after the next 15 years.
- 5
5. (a) Explain :
- (i) Specific yield of an aquifer.
  - (ii) Storage coefficient of an aquifer.
- 4
- (b) A 35 cm dia well penetrates 20 m below the static water table. After 24 hours of pumping at 6,000 litre per minute, the water level in a test well at 120 m away is lowered by 0.5 m, and in a well at 30 m away the drawdown is 1m. What is the transmissibility of the aquifer?
- 6
6. (a) Explain the significance of *E-coli* in water analysis?
- 4
- (b) Write short notes on the following :
- (i) Turbidity,
  - (ii) Nitrates, and
  - (iii) M.P.N.
- 6
7. Write short notes on the following :
- 10
- (i) Fluoridation
  - (ii) Desalination
  - (iii) Aeration
  - (iv) Softening
  - (v) Disinfection.