B.E. Civil Engineering (Model Curriculum) Semester-IV
PCCCE405 - Environmental Engineering

P. Pages : 2

Time : Three Hours

Max. Marks : 80

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Notes : 1.   All questions carry equal marks.
2.   Due credit will be given to neatness and adequate dimensions.
3.   Assume suitable data wherever necessary.
4.   Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Explain various sources of water with neat sketches. **8**

b) The census of a town show the population as follows **8**
   i)   Present Population = 50,300
   ii)   Population before one decade = 46,500
   iii) Population before two decade = 43,100
   iv)   Population before three decade = 40,500
   Estimate the population after one, two and three decades by Geometrical increase method and Incremental increase method.

OR

2. a) Explain the points to be considered while selecting the intake point. **8**

b) Describe in brief various tests conducted for chemical examination of water. **8**

3. a) State and explain the function of each unit of water treatment plant. **8**

b) A water supply project has to supply water a town having population of 70,000. Design a suitable sedimentation tank with following details. **8**
   i)   per capita demand = 180 lits/day
   ii)   Peak demand = 1.5 x average demand
   iii) Velocity of flow = 35 cm/min
   iv)   Detention period = 4 hours

OR

4. a) What are the common coagulants used in a water treatment plant? Describe the functions of the coagulates. **8**

b) Enumerate principle and operation of Clariflocculators. **8**

5. a) Describe with help of sketches, slow sand filter, explain its working. **8**

b) Calculate dimension of rapid sand filter for a population of 5 lakh and rate of water supply is 200 LPCD. Consider design flow 1.8 times the average demand flow. Assume 3% of water being used for back washing. **8**

OR

6. a) What do you understand by Chlorination? Explain its action in killing bacteria. **8**

b) Name the various disinfecting agents and explain the action of any one of these in detail. **8**

7. a) Enumerate the sources of solid waste. **8**

b) Calculate the velocity of flow and the discharge through a sewer of diameter 1 m laid at gradient of 1 in 500. Assume the sewer running full. Use manning formula's with $N = 0.012$. **8**

OR

8. a) Describe the chemical properties of sewage. **8**

b) State and explain the function of each unit of waste water treatment plant. **8**

9. a) Explain sludge digestion tank with help of neat sketch. **8**

b) Design of septic tank having following data **8**

    i) Number of users = 150

    ii) Rate of demand = 150 lit/head/day

    iii) Detention period = 16 hours

    iv) Percolating capacity of filter media = $1100 \, \text{lits} / \text{m}^3$.

OR

10. a) Explain factor affecting anaerobic digester. **8**

b) Enumerate principle of aerated logons. State advantages and disadvantages. **8**

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