QP Code : 2151

(3 Hours) [Total Marks : 100

N.B. : (1) Q. **1** is compulsory.
     (2) Answer any **4** questions out of remaining **6** questions.
     (3) **All** questions carry **equal** marks.
     (4) Draw **figures** wherever **required**.
     (5) Assume **data** if **necessary** and **justify** the same.

1. Answer any **four**.   20
   (a) Explain the air pollution effects on Plants.
   (b) What is noise pollution? What are the types of noise pollution? Give some examples.
   (c) Explain the importance of BOD/ COD ratio.
   (d) What are the forces acting on sewers?
   (e) What are the sanitary fixtures and fittings?

2. (a) Why sewage treatment is necessary? Justify your answer.   6
  (b) Explain the factors which affect the self purification of stream.   6
  (c) The 5 day 30^0C BOD of sewage sample is 110 mg/l. Calculate its 5 days   8
    20^0C BOD. Assume the deoxygenation constant at 20^0 C, K_{20} as 0.1.

3. (a) Explain the following w.r.t activated sludge process.   10
    (i) Hydraulic retention time
    (ii) F/M ratio
    (iii) Sludge age
  (b) Mention the operational troubles of a standard rate trickling filter and their   10
    remedies.

4. Write short notes on any **four**   20
   (a) Air pollution episode
   (b) Sludge drying beds
   (c) Pumping station
   (d) Aerated lagoons
   (e) Sludge volume index

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5. (a) Determine the size of high rate trickiling filter for the following data: 10

      Flow   =   4.5 MLD
      Recirculation ratio   =   1.5
      BOD of raw sewage   =   250 mg/l
      BOD removed in primary clarifier =   30%
      Final effluent BOD desired   =   30 mg/l

   (b) Explain with a neat sketch one pipe and two pipe systems of plumbing   10

6. (a) Why sewer appurtenances are required? Enlist and explain any two in detail   10
       with neat sketch.
   (b) Explain the factors that must be considered while selecting the sewer   6
       materials.
   (c) Write a note on sewage farming.   4

7. (a) Explain the stages in the sludge digestion process. What are the factors   10
       which affect the sludge digestion?
   (b) With neat sketch explain the working of Imhoff tank   10

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