This question paper contains 3 printed pages.

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Your Roll No. .....

B. Tech. (C) / IV **J**

Paper— ECE–402

ENVIRONMENTAL ENGINEERING – II

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. Attempt any five questions from the rest.

1. Differentiate the following:

   (*a*) Advantages of circular sewers over other forms of sewer section.

   (*b*) Clean out and Street inlet in Sewer Appurtenances

   (*c*) BOD aand COD

   (*d*) Primary settling tank and Secondary settling tank

   (*e*) Urban sanitation and Rural sanitation. 5×2=10

2. (*a*) Design a Sanitary Sewer with the following data:

   (*i*) Population to be served = 50,000

   (*ii*) Expected sewage flow (average) = 200 lpcd

   (*iii*) Average slope of ground = 1 in 800. 8

P. T. O.

(*b*) Calculate the ratio of discharge of a sewer when flowing at full depth to that when flowing at 0·6 depth. 4

3. (*a*) What are the precautions to be taken while entering sewers? 4

(*b*) Draw the siphon spillway type of storm regulator and write down its advantages. 4

(*c*) What precautions would you take in design and construction of sewers so that their maintenance would be simple and easy? 4

4. (*a*) The one day BOD of a sewage at 30°C has been found to be 150 mg/l. What will be the 3 day 25°C BOD? Assume K_D=0·15 at 25°C. 4

(*b*) Differentiate between suspended solids and dissolved solids. Explain the importance of solids determination in sewage. 4

(*c*) Write the average composition of domestic sewage of Delhi. 4

5. (*a*) Mention the tolerance limit for industrial effluents discharged into public sewer for the following as per BIS:

(*i*) COD

(*ii*) TSS

(*iii*) pH

(*iv*) Oil and grease

(v) Temperature

(vi) Chlorides

(vii) Copper

(viii) Cyanides. 4

(b) Write short notes on:

(i) Sewage sickness

(ii) Sludge bulking

(iii) Oxygen sag curve

(iv) Effluent irrigation. 4×2=8

6. (a) Explain the mechanism of anaerobic digestion of sludge. What are the end products and means of their disposal? 4

(b) Design an oxidation pond for treating domestic sewage of 15,000 persons supplied with 200 litres per capita water per day. The BOD and the suspended solids are each of 250 mg/l. 5

(c) Differentiate between sludge digestion tank and septic tank. 3

7. Write short notes on the following:

(i) Gully trap and S-trap

(ii) Ventilation of house sewers

(iii) Basic principles of healthy housing

(iv) Sanitation of residential buildings. 4×3=12

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