MODEL QUESTION PAPER

SIXTH SEMESTER B.TECH DEGREE EXAMINATION 2016

13.603 ENVIRONMENTAL ENGINEERING II (C)

Time : 3 hrs   **Maximum Marks : 100**

Assume suitable data if necessary

Provide neat sketches wherever necessary

Part A

All questions are compulsory.

1   List out the various physical characteristics of sewage & explain any one in detail.

2   Differentiate between Wet Weather Flow and Dry Weather Flow.

3   Sketch and label a typical dissolved oxygen sag curve.

4   Write a short note on Activated Sludge Process.

5   Discuss the principles of house drainage

(4 x 5 = 20 marks)

PART B

*Candidates have to answer one full question out of the two from each
module.   Each question carries 20 marks .*

MODULE I

6)   a) Discuss with the help of sketch any one sewer appurtenance in detail . *(6 marks)*

   b) 5mL of domestic waste water was diluted and the BOD test was carried out. Initial

   DO of the sample was found to be 7.8mg/L and the final DO was 4.3mg/L.

   Compute 1) The BOD_5^{20}

             2) Ultimate BOD, if deoxygenation rate   constant is 0.10/ day

             (Derive the formula used in this problem)   *(14 marks)*

7 a) A   25 cm dia sewer with an inverted slope of 1 in 400 is running full. Calculate

the velocity and rate of flow in the sewer. Take N= 0.015   Is it self cleansing.

(10 marks)

b) Write short notes on:

      (a) Time of concentration   (5 marks)
      (b) Types of sewers   (5 marks)

MODULE II

8. Explain on various methods of wastewater disposal in detail.   (20 marks)

9 A waste water treatment plant disposes off it's effluents into a stream at a point A. The characteristics of the stream at a location fairly upstream of A and that of the effluent are as follows:

Parameter	Effluent	Stream
Flow (m^3/s)	0.16	0.40
DO (mg/L)	1.60	8.20
Temperature (C)	25	22
BOD (mg/L)	32	2.0

Assume that the de-oxygenation constant to the base e at 20   C as 0.20/day and the re-aeration constant to the base e at 20   C = 0.40/day. The velocity of the stream downstream of the point A is 0.16 m/s.

Determine. 1 Critical DO deficit

          2 Location of critical deficit   (20 marks)

MODULE III

10 Design and sketch a circular standard trickling filter unit for treating 4 million litres of sewage per day, having a 5 day BOD of 160 mg/L. Also design the rotary system for the filter. Assume suitable design data whenever required.   (20 marks)

  11 Design and sketch a **septic tank** for a hostel of 150 persons provided with an assured water supply of 120 L/h/day (as per IS specification).   Assume suitable design data whenever required. After designing the septic tank   (14 marks)

What would be the size of the **soak pit** if the effluent from the septic tank is discharged in it. Assume percolation rate through the soak pit as 1250 L/m^3/day   (6 marks)

MODULE IV

12. Write short notes on:

              (a) Sludge treatment   (14 marks)

              (b) Systems of Plumbing   (6 marks)

13 a) Design and sketch an oxidation pond for treating sewage from a hot climatic residential colony with 5000 persons, contributing sewage @ 120 L/h/day . The 5 day BOD of sewage may be taken as 300 mg/L   (14 marks)

   b) Write a short note on sludge disposal   (6 marks)

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