09/01/18 (E) (3)

SHAHEED BHAGAT SINGH STATE TECHNICAL CAMPUS, FEROZEPUR

ROLL No: | | | | | | | | | | | | |

Total number of pages:[2]

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B.Tech. || CE || 6th Sem

ENVIRONMENTAL ENGINEERING II

Subject Code: BTCE- 606

Paper ID:

Time allowed: 3 Hrs **Max Marks: 60**

Important Instructions:

- **All questions are compulsory**
- **Assume any missing data**
- **Additional instructions, if any**

PART A (2×10)

Q. 1. Short-Answer Questions: All COs

(a) Explain the following terms : (a) Sullage (b) Sewage

(b)What do you understand by Dry Weather Flow? Discuss various factors affecting the Dry Weather Flow.

(c)What are the advantages of Circular Sewer Section?

(d)What do you understand by Drop Manhole?

(e)The 1 % solution of sewage sample is incubated for 5 days at 20°C.The depletion of oxygen was found to be 3ppm.Determine the BOD of raw sewage.

(f)Define BOD and COD.

(g)What is Grit Chamber? Why it is necessary to provide Grit Chamber?

(h)What do you understand by Sludge Volume Index (S.V.I)?

(i)Explain the terms (a) Soil Pipe (b) Waste Pipe (c) Vent Pipe

(j)What is Sewage Sickness?

PART B (8×5)

Q. 2. Describe Conservancy System and Water Carriage System. What are the relative advantages and disadvantages of the two system COa

OR

A 350 mm diameter sewer is to flow at 0.35 depth on a grade ensuring a degree of self cleansing equivalent to that obtained at full depth at a velocity of 0.8 m/sec. Given COa

(a) Manning's Rugosity coefficient = 0.014
(b) Proportionate area = 0.315
(c) Proportionate Wetted Perimeter = 0.472
(d) Proportionate HMD = 0.7705

Find (a) The Required Grade (b) Associated Velocity (c) The rate of discharge at this depth

Q. 3. Explain the two general methods adopted for Sewage Disposal. Discuss their merits and demerits and also Explain the favorable conditions. COb

OR

The 5 days BOD of waste water is 150 mg/l at 20°C.The k value is known to be 0.23 per day. What would 8 days BOD be, if the test was run at 15°C — COb

Q. 4. Difference between Standard Rate trickling Filter and High Rate trickling Filter. Also mention the operational troubles of a Standard Rate trickling Filter — COc

OR

The Sewage flows from a Primary Settling tank to a standard rate trickling filter at a rate of 5 million litres per day having a 5 day BOD of 150 mg/l. Determine the depth and the volume of the filter adopting a surface loading of 2500 l/m^2/day and an organic loading of 165gm/m^3/day. Also determine the efficiency of the filter unit — COc

Q. 5. An average operating data for conventional activated sludge treatment plant is as follows: — COd

(a) Wastewater Flow = 35000 m^3/day
(b) Volume of aeration tank = 10900 m^3
(c) Influent BOD
(d) Effluent BOD
(e) Mixed Liquor Suspended Solids
(f) Effluent Suspended Solids
(g) Waste sludge suspended solids
(h) Quantity of Waste Sludge

Based on the above information ,determine:(a) Aeration Period (hrs) (b) Food to microorganism ratio (kg BOD per kg/kg MLSS) (c) % efficiency of BOD removal (d) Sludge age (days)

OR

Design UASB treatment process treating an industrial waste water to determine the (1) Reactor Volume (2) Reactor Dimensions and (3) Reactor Hydraulic Detention Time. Wastewater Characteristics Flow rate =1000m^3/d, COD = 2300m^3/d , sCOD = 2000gm/m^3,TSS = 200gm/m^3,VSS = 150gm/m^3 and reactor volume effectiveness factor 85%.Make suitable assumption which you need. — COd

Q. 6. Name and Explain with sketches, the different types of traps used in house sewer connection. What is the patented name of famous trap, used in India in kitchen or bath drains — COe

OR

Design the dimension of a Septic Tank for a small colony of 150 persons provided with an assured water supply from the municipal head works at a rate of 120 litres per person per day. Assume any data ,you may need. Also explain the advantages of Septic Tank. — COe