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SHAHEED BHAGAT SINGH STATE TECHNICAL CAMPUS, FEROZEPUR

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

Total number of pages:[2]

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M.Tech|| CHE || 5th Sem

Environmental Engineering

Subject Code: MTCH-501

Paper ID:

Batch: 2011onwards

Time allowed: 3 Hrs **Max Marks:100**

Important Instructions:

- **Attempt any five questions**
- **All questions carry equal marks**
- **Assume any missing data**

Q 1 (a)What are various biological methods for the waste water treatment? Explain the activated sludge method. (10)

(b). Explain any one method of removal of suspended solids from the waste water. (10)

Q 2 (a) What are various gaseous pollutants in the air? Explain their ill-effects. (10)

(b) What are the various processes for removal of gaseous pollutants from flue gas? Explain any one process in detail. (10)

Q 3 (a) Discuss the mechanism of separation of particulates in a cake filteration in a single layer filter. Indicate the important factors affecting the pressure drop across the bag house. (10)

(b) Calculate the collection efficiency for a gas (viscosity of 1.81×10^{-5} kg/m.s) having flow rate of 7 m^3/s, particle density 1500 kg/m^3 & dia of 10 μm, if a multiple cyclone (64 cyclones each of dia 24 cm) is used instead of a single large unit. (10)

Q 4 (a) Explain atmospheric stability in the context of temperature lapse rate. (10)

(b) The following table shows the size distribution of a dust sample and the fractional efficiency of removal in the gas cleaning equipment.

Dust size	< 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70
Weight per 100 gm of dust (gm)	2	2	4	7	10	8	7	10	15	20	10

Calculate the overall collector efficiency. (10)

Q 5 (a) What is BOD? What is the significance of BOD calculation? (5)

(b) A pond is used to treat dilute municipal waste water before the liquid is discharged into the river. The inflow of the pond has a flow rate of Q = 4000 m^3 per day and BOD concentration of C_{in} = 25 mg L^{-1}. The volume of the pond is 20,000 m^3. The purpose of the pond is to allow time for the decay of BOD to occur before the discharge into the environment. BOD decays in the pond with a rate constant equal to 0.25 per day. What is the concentration at the outflow of the pond in mg L^{-1}. (15)

Q 6 (a) What is TOC? How is it calculated? (10)

(b) Explain various types of plume behavior. (10)

Q 7 (a) Compare aerobic and anaerobic digestion. (10)

(b) Write short notes on (i) Noise pollution (ii) Recovery of minerals from solid wastes. (10)

Q 8 (a) What is ISO-14000 and its impact on auditing? (10)

(b) What are e-wastes? Explain their disposal techniques. (10)