

**GANPAT UNIVERSITY**  
**B. Tech. Semester VI<sup>th</sup> Civil Engineering**  
**Regular Examination – May/June : 2013**  
**2CI- 605: Environmental Engineering - II**

Time: 3 Hours

Total Marks: 70

**Instructions:** - (1) Answer to the two sections must be written in **separate** answer books.

(2) Figures to the right indicate **full** marks.

(3) Assume suitable data **if** required.

**Section - I**

**Q-1 Attempt the following questions:**

- (A) Design an oil and grease trap to remove 260 ppm of oil and grease from a flow of 25 MLD of domestic wastewater. (6)
- (B) Draw the flow Chart of sludge treatment and disposal. (6)

OR

**Q-1 Attempt the following questions:**

- (A) Assuming suitable design data, Design a pumping station for the average flow of 1MLD. The raw water is carried out 200 m far away and the total static head is 8m. The manning's coefficient for RCC is 0.013. Take pick factor is 2. (12)

**Q-2 Attempt the following questions:**

- (A) Determine the liquid volume before and after digestion and percentage reduction for 1000 kg (dry basis) of the primary sludge having following characteristics. (11)

Characteristics	Primary	Digested
Solids (%)	7	11
Volatile matter (%)	70	66 (destroyed)
Specific gravity of fixed solids	2.5	2.5
Specific gravity of volatile solids	~1.0	~1.0

OR

**Q-2 Attempt the following questions:**

- (A) Assume suitable design criteria; Design a trickling filter for 1.5 ML of water having an organic loading 15 ppm and hydraulic loading  $3 \text{ m}^3/\text{m}^2/\text{sec}$ . take peak factor 2.5. (Do not design Under drainage system) (11)

**Q-3 Attempt the following questions:**

- (A) Explain concept of Enzyme Reaction. (4)

P.T.O

- (B) What do you understand by net and Overall dimension of the unit? Define the same with neat sketch of Rectangular Unit. (4)
- (C) Explain concept of mass load. (4)

## Section – II

**Q-4 Attempt the following questions:**

- (A) Describe the zones of pollution in river streams with neat figure. (7)
- (B) The following observations were made on a 3% dilution of waste water. DO of aerated water used for dilution is 3.0 mg/L. DO of diluted sample after 5 days incubation is 0.8 mg/L. DO of original sample is 0.6 mg/L. Calculate BOD of 5 days and ultimate BOD of the sample assuming that  $KD=0.1$  at test temperature. (5)

OR

**Q-4 Attempt the following questions:**

- (A) Explain sewage sickness and eutrophication. (6)
- (B) Discuss briefly separation of recyclable materials. (6)

**Q-5 Attempt the following questions:**

- (A) Discuss the factors affecting self purification of river streams. (6)
- (B) The following test results were obtained for a wastewater sample taken at an industrial facility. All of the tests were performed using a sample size of 100 ml. (5)

Determine the concentration of Total Solids, Total Suspended Solids, Total Volatile Solids, and Dissolved solids.

Tare mass of evaporating dish = 54.6423g

Mass of evaporating dish plus residue after evaporation at 105°C = 54.7148g

Mass of evaporating dish plus residue after ignition at 550°C = 54.6818g

Tare mass of Whatman GF/C filter = 1.5346g

Mass of Whatman GF/C filter plus residue after drying at 105°C = 1.5571g

Mass of Whatman GF/C filter plus residue after ignition at 550°C = 1.5418g

OR

**Q-5 Attempt the following questions:**

- (A) Explain Lamp holes with neat sketches. (5)
- (B) The average sewage flow from a city is  $80 \times 10^6$  L/d. If the average 5-day BOD is 285 mg/L, compute the total daily 5-day oxygen demand in kg, and the population equivalent of sewage,  $KD=0.1$ . Assume per capita BOD of the sewage per day = 75 gm. (3)
- (C) Define COD. Compute theoretical oxygen demand of chemical compound Ketone ( $CH_3COC_2H_5$ ) measuring 350 mg/L in a solution. (3)

**Q-6 Attempt the following questions:**

- (A) Discuss sanitary land filling disposal method for municipal solid waste with neat figure. (6)
- (B) Discuss briefly cement concrete sewers. Explain crown corrosion. (6)

**“END OF PAPER”**