Mid-West University
Examinations Management Office
Chance Examinations 2081

Bachelor level/ B.E. Civil/ 7th Semester	Full Marks: 50
Time: 3 hours	Pass Marks: 25

Subject: Sanitation Engineering (CE422)

- *Attempt all the questions*
- *Figures in the margin indicate full marks.*
- *Assume suitable values, with a stipulation, if necessary.*
- *Candidates are required to answer the questions in their own words as far as possible.*

1. a) What are the systems of sewage disposal? Briefly describe with merits and demerits. [1+3]

    b) Describe the sources of sanitary sewage and various factors affecting quantity of sanitary sewage. [1+2]

2. a) Determine the velocity of the flow in a sewer running half full. The sewer is laid at 1 in 550 slopes. The diameter of the sewer is 1.5m. Also determine the discharge flowing through the sewer. Assume Manning's formula taking n= 0.014. [4]

    b) Describe the Inverted Siphon and lamphole with neat sketches. [2+2]

3. a) What do you mean by Bio-Chemical Oxygen demand (BOD)? Explain the significance of BOD. [1+3]

    b) Draw the oxygen sag curve showing the zones of pollution along river. [5]

4. a) Design the grit chamber for the maximum discharge 8000 m³/day to remove the particles up to 0.2 mm diameter having specific gravity of 2.65, settling velocity 'v,' ranges from 0.018 to 0.021 m/s. Maintain a constant flow through a velocity of 0.3 m/s through the provision of flow weir. Assume necessary data. [7]

    b) The wastewater effluent having BOD of 239 mg/l from a town having a population of 50000 numbers with an average wastewater flow rate of 100 lpcd through primary settling tank is applied to a standard rate trickling filter to achieve effluent BOD of 25 mg/l. The primary sedimentation tank removes 39% of BOD. Determine the depth and diameter of tank. Assume necessary data. [7]

5. a) Why treatment of sludge is necessary? Explain the method of dewatering of sludge by mechanical method. [1+3]

    b) What is the purpose of pit privy? Describe the construction of pit privy with a neat sketch. [1+4]

    c) Write short notes: (i) Garbage (ii) Rubbish (iii) Special Waste [3]

The End