

M.E. Second Semester (Civil (Environmental Engineering)) (P.T.) (CGS)
13392 : Advanced Waste Water Treatment : 2 SCEE 3

P. Pages : 2

Time : Three Hours



AU - 3215

Max. Marks : 80

- Notes :
1. All questions carry marks as indicated.
 2. Answer **three** question from Section A and **three** question from Section B.
 3. Due credit will be given to neatness and adequate dimensions.
 4. Assume suitable data wherever necessary.
 5. Illustrate your answer necessary with the help of neat sketches.

SECTION - A

- | | | | |
|----|----|---|---|
| 1. | a) | Explain in detail about various wastewater characteristics. | 6 |
| | b) | Draw the flowsheet of the conventional wastewater treatment plant and explain the functions of various units provided. | 7 |
| 2. | a) | Explain with neat sketch the hydraulic characteristics of reactors most commonly used in the field of wastewater treatment. | 7 |
| | b) | State the principle benefits derived from the application of equalisation flow. Explain how you determine volume of equalization basin. | 6 |
| 3. | a) | Design a screen chamber for the data given below.
Maximum flow $0.42 \text{ m}^3/\text{s}$
Average flow $0.21 \text{ m}^3/\text{s}$
Minimum flow $0.084 \text{ m}^3/\text{s}$
Assume any other suitable data if required. | 8 |
| | b) | Explain various methods of disposal of screenings. | 5 |
| 4. | a) | What is proportional flow weir? How do you determine the geometry of such a weir? | 6 |
| | b) | Design a grit chamber having rectangular cross-section and a proportional flow weir as the velocity control device for the following data:
Maximum Flow = 20 MLD
Diameter of Smallest particle to be removed 0.2mm
Average temperature = 20°C
Specific gravity of grit particle = 2.65. | 8 |
| 5. | a) | Explain the process of flocculation, list various coagulants normally used in Wastewater treatment. | 7 |
| | b) | Design a sedimentation tank to treat 12MLD of wastewater. | 6 |

SECTION - B

- | | | | |
|-----|-----|---|----|
| 6. | a) | List various modifications of Activated sludge process. Explain any two methods in detail. | 10 |
| | b) | Explain in detail suspended growth biological system. | 4 |
| 7. | a) | Explain with the help of neat sketch the construction and working of a RBC. | 8 |
| | b) | Discuss in detail various pathways of anaerobic digestion. | 5 |
| 8. | a) | Explain the following with respect to sludge treatment. | 10 |
| | i) | Stabilization | |
| | ii) | Dewatering. | |
| | b) | List various methods of sludge disposal. | 3 |
| 9. | a) | What do you understand by sludge thickening? Enumerate various methods. Describe with the help of neat sketch Gravity sludge thickener. | 6 |
| | b) | Design a sludge drying beds for digested sludge from an activated sludge plant serving 1,20,000 persons. | 7 |
| 10. | | Explain the following. | |
| | a) | Effect of pH and temperature on digestion of sludge. | 4 |
| | b) | Phytoremediation technique for polishing of wastewater. | 4 |
| | c) | Phosphorous and Nitrogen removal. | 5 |

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