M.E. Second Semester (Civil (Environmental Engineering) (P.T.) (CGS)

13390 : Advanced Water Treatment : 2 SCEE 2

P. Pages : 2

AW - 3664

Time : Three Hours

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Max. Marks : 80

Notes : 1. All question carry equal marks.
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.

SECTION – A

1. a) What do you understand by process design of water treatment plants? Explain how common attributes of water are affected by conventional unit operations and processes. **7**

b) Explain the effect of Impoundment on water quality. **6**

2. a) Discuss the various methods to control the algae in an impounded reservoir. Suggest a novel method. **7**

b) Explain in brief quality of underground water. **6**

3. a) How the settling velocity is calculated in Laminar zone, transition zone and turbulent zone. **6**

b) Explain chemical coagulation and concept of surface charge. **7**

4. a) How the efficiency of settling tank is reduced by currents? Give the performance curve for same. **6**

b) Work out the dimensions of a flocculator to treat 10 million liters of water per day. Also calculate the area of each paddle and number of paddles. Assume water temperature as 25°C, $\mu = 0.89 \times 10^{-3}$ kg/m.s and density of water $\rho = 997$ kg/m^3. Assume other suitable data. **8**

5. a) Design a coagulation sedimentation tank to treat 15 million litres of water per day. Assume suitable data. **7**

b) Differentiate gravity and pumping system. **6**

SECTION – B

6. a) Differentiate between slow sand filter and rapid sand filter. **6**

b) Design completely a rapid sand filter for a town having total filtered water requirement of 8 million litres per day. Assume suitable data. **7**

7. a) Discuss the factors influencing adsorption process. **6**

b) Explain principles of disinfection. What are the factors affecting disinfection. **7**

8. a) What are the various forms of application of chlorine? Write a note on hypochlorination. **7**

b) Write in details about "Freundlich Isotherm". **6**

9. a) What factors affect the process of corrosion and how corrosion is to be controlled? Explain in details. **7**

b) What are the causes of taste and odours in water available from various sources? Enumerate the method for their removal. **7**

10. Write short note on. **13**

i) Loss of head and negative head.

ii) Theory of adsorption.

iii) Break point chlorination.

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