Register No.: ..... Name: .....

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

SEVENTH SEMESTER B.TECH DEGREE EXAMINATION (R), DECEMBER 2023
CHEMICAL ENGINEERING
(2020 SCHEME)

Course Code : 20CHT493

Course Name: Process Design for Wastewater Treatment

Max. Marks : 100 **Duration: 3 Hours**

PART A

(Answer all questions. Each question carries 3 marks)

1. Give the influential objectives of wastewater treatment.
2. List out the fine screens used for primary treatment.
3. Give the significance of Michaelis-Menten Equation.
4. Explain the role of microorganism in waste water treatment process.
5. List the process design considerations for aerobic biological treatment.
6. Express the significance of Aerobic Biological Treatment
7. What are the factors affecting Anaerobic Treatment?
8. Suggest the best method to enhance solid loading in biological treatment.
9. What is centrifugal thickening and when is it employed?
10. Mention different types of pumps and its application used for handling sludge.

PART B

(Answer one full question from each module, each question carries 14 marks)

MODULE I

11. Explain different types of reactors employed in wastewater treatment with the help of figures. (14)

OR

12. Mention the screening classification in detail and illustrate working of Catenary screen with a diagram. (14)

MODULE II

13. a) Emphasize the Bacterial growth patterns in a batch reactor (10)
    b) Define biomass yield also give the method of its estimation. (4)

OR

14. a) Discuss various factors affecting the bacterial growth. (10)
    b) Illustrate the Michaelis-Menten equation in detail. (4)

MODULE III

15. a) Explain in detail Suspended Growth and Attached Growth Treatment systems. (8)
    b) Describe the process design considerations for aerobic treatment systems. (6)

OR

16. a) With a neat sketch, explain aerobic suspended growth treatment process of wastewater? (8)
    b) List different methods employed for aeration in activated sludge processes. (6)

MODULE IV

17. Explain in detail the mechanism of anaerobic treatment and also give the factors affecting anaerobic treatment processes. (14)

OR

18. Discuss the Up-flow anaerobic sludge blanket process and its design consideration. (14)

MODULE V

19. a) Mention different characteristics of sludge (6)
    b) Explain in detail the Thickening and Stabilization process in sludge management. (8)

OR

20. a) Discuss recent advances in sludge residue disposal. (6)
    b) Explain Sludge dewatering in detail? (8)

****