

Register No.: Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

SIXTH SEMESTER B.TECH DEGREE EXAMINATION (R), MAY 2024

(2020 SCHEME)

Course Code : 20CHT394

Course Name: Advanced Wastewater Treatment Techniques

Max. Marks : 100

Duration: 3 Hours

PART A

(Answer all questions. Each question carries 3 marks)

1. Explain briefly the purpose of advanced wastewater treatment plants.
2. State different levels of wastewater treatment process. Give examples for each.
3. List unit operations in wastewater treatment.
4. Explain rotating biological contactors.
5. Explain the tertiary wastewater treatment with the help of an example.
6. Explain the classification of membranes processes based on their separation size range.
7. Explain the solar photo catalytic treatment systems.
8. List the factors affecting electro-coagulation processes.
9. Explain the cleaner technologies in wastewater treatment.
10. Discuss the water conservation methods in wastewater treatment plant.

PART B

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

MODULE I

11. a) Explain the different characteristics of wastewater. (7)
b) What are the various regulatory requirements of treated wastewater before disposal. Explain. (7)

OR

12. What are the desired features of Water Act 1974 and Environment Protection act 1986 for the disposal of industrial effluent. Explain the power of Government to take action against industry which is violating the rule. (14)

MODULE II

13. a) Explain any two conventional biological processes with a neat sketch. (7)
b) Explain the principle of secondary wastewater treatment methods. (7)

OR

14. a) Explain the principles nitrogen and phosphorus removal from wastewater. (7)
b) State any two low cost wastewater treatment methods and explain with neat sketch. (7)

MODULE III

15. a) Write short notes on the treatment of wastewater using forced circulation and falling film evaporators. (7)
b) With neat sketch, explain the construction and working of hollow fiber and spiral wound membrane modules. (7)

OR

16. a) Explain the advanced oxidation process of ozone and non-ozone-based process. (10)
b) What are the most important properties of resins to be used in the ion exchange technique? (4)

MODULE IV

17. a) Explain the process of electrocoagulation and its reactor configurations with the help of neat sketch. (9)
b) Compare the ozone and non-ozone process with Fenton and non-Fenton process. (5)

OR

18. a) Compare and explain the theories of electrochemical and advanced oxidation processes with an example for each. (10)
b) Explain the process of electro-flotation and its reactor configurations with the help of neat sketch. (4)

MODULE V

19. a) Explain the source, characteristic and methodology, treatment processes in paper and pulp mill. (7)
b) Explain the source, characteristic and methodology, treatment processes of a textile industry. (7)

OR

20. What are the operational problems encountered in the treatment plants explain with suitable examples. (14)
