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Question Paper Code : 91035

B.E/B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2022

Seventh Semester

Biomedical Engineering

OCY 751 – WASTE WATER TREATMENT

(Common to: Computer Science and Engineering/Computer and Communication Engineering/Electronics and Communication Engineering/Electronics and Telecommunication Engineering/Medical Electronics/Information Technology)

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List out the physicochemical parameters of water.
2. How do you assess the quality of water.
3. Why filter aids are used in filtration process?
4. How lime soda can be utilized as water softening agent?
5. Write the role of activated carbon in the treatment of wastewater.
6. What is Langelier index?
7. Why pretreatment is required for treating the wastewater?
8. Write the fundamental components of a complete tricking filter system.
9. What are adsorption isotherms?
10. Illustrate any one advanced oxidation process with chemical reaction.

PART B — (5 × 13 = 65 marks)

11. (a) Outline the physical, chemical and biological process of water purification systems.

Or

- (b) Describe the principle of coagulation process and add a special note on the destabilization of colloids with appropriate examples.

12. (a) Illustrate the working principle of normal flow filtration process and discuss its design considerations with appropriate illustrations.

Or

- (b) Use the Darcy's law to describe the flow of a fluid through a porous medium and brief about its validity.

13. (a) Define adsorption and explain the role of adsorbents in the removal of taste, odour and color of the wastewater with suitable examples?

Or

- (b) How to prevent and control corrosion and write a detailed account on the various factors involved in the onset of corrosion?

14. (a) Describe the operation and maintenance of waste stabilization ponds.

Or

- (b) Elaborate the process description and design consideration of trickling filters employed in the wastewater treatment operations.

15. (a) Discuss the role of ion exchangers in the wastewater treatment processes and highlight the bed regeneration processes.

Or

- (b) Elaborate the process description and chemical principles of advanced oxidation process.

PART C — (1 × 15 = 15 marks)

16. (a) You are appointed as an Engineer in an effluent treatment plant in a tannery industry. Give a process flow sheet diagram for the treatment of disposed waste water and identify the bottlenecks in the proposed plan.

Or

- (b) You are asked to visit a local freshwater body which was contaminated with the effluents of dyeing and garment industries. Propose a treatment option with a neat process flow diagram for the removal of dyes and organic matter.

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