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Question Paper Code : 20392

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2023.

Fifth Semester

Civil Engineering

CCE 334 – INDUSTRIAL WASTEWATER MANAGEMENT

(Regulations 2021)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write the sources and types of Industrial Waste Water.
2. What is Bioassay Test?
3. What is B.O.D? Differentiate B.C.D. from C.O.D.
4. Define Heavy Metal.
5. What is Zero Liquid Discharge?
6. Write the various Biological treatment Methods of Waste Water.
7. What is Activated Sludge Process?
8. How the R.O rejects are managed?
9. What are the major characteristics of Industrial effluents?
10. What are the various Regulatory frame works available in India to control and manage the waste water pollution?

PART B — (5 × 13 = 65 marks)

11. (a) Write the various sources and types of industrial waste water. Write the impact of waste water on Environment and how it can be mitigated.

Or

- (b) Write the major issues which we come across in water quality management. How it can be solved technically and legally?

12. (a) Write in detail the waste water Management Hierarchy.

Or

- (b) Evaluate the various pollution prevention options with special reference to cost benefit, pay back period and other economic aspects.

13. (a) Explain in detail about the Biological treatment process its advantages and disadvantages.

Or

- (b) How the organic constituents are removed from waste water? Explain the process of ion exchange, adsorption and electro dialysis.

14. (a) Write in detail the various issues faced in common and individual effluent treatment plants. Add a note on Heavy Metal Removal Process from the waste water.

Or

- (b) Write the advantages and disadvantages of Joint Treatment process for industrial and domestic waste water.

15. (a) With the help of Flow Chart explain in detail the process of Sugar and distillery waste water treatment.

Or

- (b) Write the characteristics of waste water from Textile industry. Explain the methodology of treatment process.

PART C — (1 × 15 = 15 marks)

16. (a) Explain in detail the characteristics of sludge, thickening, digestion, conditioning, dewatering and disposal thickening.

Or

- (b) Explain in detail the characteristics of Tannery Effluents and the methodology of treatment.