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Question Paper Code : 50764

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2024.

Fifth/Sixth Semester

Mechanical Engineering

CME 366 — EQUIPMENT FOR POLLUTION CONTROL

(Common to Civil Engineering)

(Regulations 2021)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What was the primary purpose of the water Act (1974)?
2. What measures are mandated for the disposal of biomedical waste under the biomedical waste management rules?
3. What is the primary function of a clarifier in water treatment?
4. What is the fundamental principle behind the functioning of a distillation unit in water treatment?
5. What is the primary mechanism through which cyclone separators separate particles in air pollution control systems?
6. What is the primary role of microorganisms in biofilters employed for air pollution control?
7. What role does the filtering medium play in the operation of vacuum filters used in solid waste processing?
8. Write short notes on the process of pyrolysis in solid waste management.
9. How are discrete water samplers typically operated in the field for sample collection?
10. What is the primary function of dust and smoke detectors in air quality monitoring?

PART B — (5 × 13 = 65 marks)

11. (a) Describe the challenges faced in the effective implementation of municipal solid waste management rules. Suggest measures and strategies to overcome these challenges for better waste management practices.

Or

- (b) Define unit processes in the context of pollution control and briefly explain their importance in mitigating environmental pollution.

12. (a) Discuss the design considerations for effective implementation of sand filters in water pollution control.

Or

- (b) Evaluate the significance of automated chemical dosing systems in modern water treatment plants- Analyze the advantages, and challenges associated with automated dosing systems compared to manual dosing methods.

13. (a) Explain the operational principles of wet scrubbers in pollutant removal from industrial exhaust streams.

Or

- (b) Discuss the key design criteria considered in the selection and implementation of bag filters for air pollution control.

14. (a) Discuss the critical design criteria considered in the selection and implementation of dewatering equipment for solid waste management. Provide examples of dewatering equipment used in solid waste management and explain any one in detail.

Or

- (b) Explain the operational principles of incinerators and their significance in managing solid waste.

15. (a) Explain the role of specialized equipment like core samplers and drum thieves in sampling solid waste from different sources. Detail their operational principles and the advantages they offer in collecting samples for waste characterization.

Or

- (b) Discuss the significance of particulate matter samplers in environmental monitoring. Explain the operational principles and functions of high-volume PM samplers.

PART C — (1 × 15 = 15 marks)

16. (a) Discuss the critical elements and significance of environment impact assessment (EIA) notifications in the regulation framework for developmental projects, analyze the procedural aspects, key components and the role of stakeholders in ensuring effective environmental management and sustainability.

Or

- (b) Discuss the critical parameters and methodologies involved in the comprehensive performance assessment of air pollution control equipment. Provide examples or case studies to illustrate your points.
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