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Question Paper Code : 90603

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

Fifth/Seventh Semester

Environmental Engineering

EN 8591 – MUNICIPAL SOLID WASTE MANAGEMENT

(Common to: Civil Engineering)

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List out any two factors affecting solid waste generation.
2. Enumerate the physical characteristics of municipal solid wastes.
3. Distinguish between reuse and recycle in context of municipal solid waste.
4. Name any two diseases transmitted by improper storage of MSW.
5. Enumerate the types of vehicles used for collection of MSW.
6. What role does transfer station play in MSW management?
7. What is the significance of C/N ratio in composting process?
8. Give the products of pyrolysis process.
9. List out any two factors which are to be considered while selecting suitable site for sanitary landfill.
10. What are the issues pertaining to dumpsite rehabilitation.

PART B — (5 × 13 = 65 marks)

11. (a) Briefly explain the sources of municipal solid wastes. Compare and contrast the characteristics of solid wastes in Indian cities with that of developed countries.

Or

- (b) Discuss the salient features of Indian legislation pertaining to municipal solid waste management.

12. (a) Explain the importance of On- Site segregation of solid wastes and how it can be enforced in Indian cities.

Or

- (b) Discuss the various issues pertaining to public health and economic aspects of storage of MSW.

13. (a) Explain the various operation and maintenance issues pertaining to collection and transfer of MSW.

Or

- (b) List out and explain the factors to be considered in selecting solid waste collection equipment?

14. (a) Discuss the options for processing of municipal solid waste from larger urban areas of the developing world.

Or

- (b) What is meant by biomethanation? Discuss the biomethanation process for resource recovery from solid waste with the aid of a schematic diagram.

15. (a) Describe the design and operation of a sanitary landfill with a neat sketch.

Or

- (b) Identify the adverse effects of a landfill leachate and explain appropriate control measures.

PART C — (1 × 15 = 15 marks)

16. (a) How does incineration help in the management of solid waste? Describe the incineration technologies and air emissions and its control in detail.

Or

- (b) (i) A rural community of 40,000 persons generates solid waste at an average rate of 0.4 kg/capita/day. A 10 ha landfill site is available, with an average depth of compacted waste limited to 6 m by local topography. It is estimated that the compacted waste will have a density of 800 kg/m³ and about 25% of volume will be taken by the cover material. What is the anticipated useful life of the landfill? (6)

- (ii) Explain Integrated Solid Waste Management by citing out the political, environmental and economic aspects along with its advantages. (9)