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# B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

## February / March 2024 Semester End Main Examinations

**Programme: B.E.**

**Semester: I / II**

**Branch: Common to all Branches**

**Duration: 3 hrs.**

**Course Code: 22CV1ESWMT / 22CV2ESWMT**

**Max Marks: 100**

**Course: Waste Management**

**Instructions:** 1. Answer any FIVE full questions, choosing one full question from each unit.  
2. Missing data, if any, may be suitably assumed.

### MODULE - I

1 a) With respect to source of generation, type and property explain in detail and classify solid waste. **12**

b) What is the 4R concept? Explain in detail the hierarchical system of integrated solid waste management. **08**

### MODULE - II

2 a) List and in detail explain physical, chemical and biological characteristics of waste. **10**

b) The data for waste generation rate per day for a residential colony that houses 2100 dwellings has been shown in the table below. In this case the local transfer station receives all the waste collected for disposal. The period of observation is for 7days. Assuming 4 people in one dwelling, determine the per capita generation rate. **10**

Vehicle type	No. of trips	Volume of Vehicle (m <sup>3</sup> )	Specific weight of solid waste (kg/m <sup>3</sup> )
Compactor truck	14	19.5	296.0
Flat bed load truck	12	6.0	132.0
Private cars/trucks	36	0.32	86.0

### MODULE - III

3 a) Explain with the help of a neat sketch the components of a landfill and explain their functions. List the types of landfills. **10**

b) Explain gas emission from landfill and Explain fuel recovery from gas emissions from a landfill. Mention an example of a fuel recovery from a case study in any of the Indian cities. **10**

**OR**

**Important Note:** Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

4 a) With respect to residential, commercial and industrial utilities, explain in detail different methods of waste collection services. **10**

b) What is leachate? With a neat sketch explain the formation of leachate in a landfill site. Explain the environmental effects of leachate and effective method of treating leachate. **10**

#### **MODULE - IV**

5 a) Explain the benefits of recycling and discuss the different techniques of recycling. **10**

b) Explain the impact on the environment due to improper disposal of plastic waste and discuss the recycling of different types of plastic wastes. **10**

#### **OR**

6 a) Explain the key steps during recycling process. Explain the recycling process for paper and steel. **10**

b) Explain the typical sorting procedure at a material recovery facility. Write a note on safety of recycled plastics for food packaging. **10**

#### **MODULE - V**

7 a) List different types of hazardous waste. What are the different types of treatment options for hazardous waste. **12**

b) List and explain on storage and handling of hazardous waste. List the protective equipment for personnel handling hazardous waste **08**

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