U.S.N.										

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

Autonomous Institute Affiliated to VTU

May 2023 Semester End Main Examinations

Programme: B.E. **Semester: I**
Branch: Common to all Branches **Duration: 3 hrs.**
Course Code: 22CV1ESWMT **Max Marks: 100**
Course: Waste Management **Date: 08.05.2023**

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

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.

MODULE - I

1 a) Define the terms Solid waste, Municipal Solid waste, refuse, and diversion rate? **06**

b) Explain how solid waste is classified? Also explain the factors on which generation of solid waste depends. **04**

c) With a Flow diagram explain the functional elements of solid waste management. **10**

MODULE - II

2 a) Define waste stream Assessment? **03**

b) Enumerate the physical characteristics of solid waste. **10**

c) A typical household in Bangalore city produces, 2 kg waste per day. Design the size of the dustbin for their kitchen. The waste composition is as follows: **07**

Component	Percentage (wt)	Density (kg/m^3)
Food	50	360
Paper	10	33
Plastics	15	118.6
Green waste	10	298
Dirt and Fines	10	712
Others	5	100

MODULE - III

3 a) What is transfer station? What are its objectives? **04**

b) With a neat sketch explain Hauled container system bringing out the advantages and disadvantages **08**

c) Mention the factors to be considered in containers on-site process technique. **08**

OR

4	a)	Write a note on Leachate formation and methods of treating leachate in a landfill.	**08**
	b)	Describe site selection criteria of sanitary landfill. Explain landfill gas recovery and landfill reclamation.	**08**
	c)	Estimate the landfill area required per year for the community having a population of 6,50,000 if the unit rate of waste generation is 1.2 kg/capita/day. Take the specific weight of waste in compacted state as 450 kg/m^3 and average depth of compacted solid waste is 8 m.	**04**

MODULE - IV

5	a)	Explain the following processing techniques briefly 1) Mechanical volume reduction and 2) Chemical volume reduction	**10**
	b)	Explain the process of the following: 1) Drying and dewatering 2) Source reduction	**08**
	c)	Explain the significance of recycling of waste materials.	**02**

OR

6	a)	Categorize and briefly explain different waste minimization techniques which can be adopted in solid waste management.	**08**
	b)	Differentiate between incineration, composting and pyrolysis processing techniques of solid waste.	**08**
	c)	Explain the importance of Material and Energy Balance in Waste Minimization techniques.	**04**

MODULE - V

7	a)	Define Hazardous waste? Explain the characteristics of hazardous waste.	**10**
	b)	Enumerate the hazardous waste management facility.	**07**
	c)	List various methods to treat hazardous waste.	**03**

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