U.S.N.										

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

Autonomous Institute Affiliated to VTU

January / February 2025 Semester End Main Examinations

Programme: B.E. **Semester: VI**
Branch: Civil Engineering **Duration: 3 hrs.**
Course Code: 22CV6PESWM **Max Marks: 100**
Course: Solid 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.

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.

			UNIT – I	CO	PO	Marks
1	a)		Evaluate the functional elements of solid waste management by constructing an organized flow chart and analyzing each component's role.	CO 2	PO1	10
	b)		Analyze the physical and chemical characteristics of solid waste, discussing how these properties impact waste management practices.	CO 1	PO1	10
			OR			
2	a)		Evaluate the various sources of solid waste, providing detailed examples and analyzing their contribution to the overall waste stream.	CO 1	PO1	10
	b)		Assess the distinction between a stationary container system and a hauled container system using a clear diagram.	CO 2	PO2	10
			UNIT – II			
3	a)		Evaluate the various techniques used for component separation of solid waste.	CO 2	PO2	10
	b)		Analyze the design criteria for the incineration of solid waste. Explain the working process of incineration with neat sketch.	CO 2	PO2	10
			OR			
4	a)		Explain the 3T's of Incineration process. Explain the working of an electrostatic precipitator with neat diagram. Also discuss its efficiency as an emission controlling facility.	CO2	PO2	10
	b)		Define mechanical size reduction. Briefly explain the various types, mode of action and applications of equipment's used for mechanical size reduction.	CO 2	PO1	10

			UNIT - III			
	5	a)	Evaluate the factors influencing the composting of solid waste, analyzing how each factor affects the composting process.	***CO*** 3	***PO2***	**10**
		b)	Elucidate the key aspects of Bangalore process and Indore process of composting.	***CO*** 3	***PO2***	**10**
			OR			
	6	a)	Discuss the principle of working of vermicomposting method. List the advantages and disadvantages of this vermicomposting technique.	***CO*** 3	***PO1***	**10**
		b)	Estimate the theoretical volume of methane gas that would be expected from the anaerobic digestion of a ton of a waste having the composition $\mathbf{C_{50}H_{100}O_{40}N}$. Use the expression; $\mathbf{C_aH_bO_cN_d + (4a-b-2c+3d)\ H_20\ /4 \rightarrow [[(4a+b-2c-3d)CH_4\ ]/8]\ +\ [[(4a-b+2c+3d)CO_2\ ]/8]+\ +dNH_3}$.	***CO*** 2	***PO2***	**10**
			UNIT – IV			
	7	a)	Explicate the construction and operation of a sanitary landfill with a neat sketch**.**	***CO*** 3	***PO2***	**10**
		b)	Assess various factors that need to be considered for selection of a suitable site for a landfill.	***CO*** 3	***PO2***	**10**
			OR			
	8	a)	Explain the control of movements of gases in a sanitary landfill with a neat sketch	***CO*** 3	***PO1***	**10**
		b)	Explain the area method and trench method of lanfilling techniques stating merits and demerits.	***CO*** 3	***PO1***	**10**
			UNIT – V			
	9	a)	Explain the working principle of XRD analysis and evaluate its application in the field of solid waste management.	***CO*** 3	***PO1***	**10**
		b)	Elucidate the working principle of FTIR analysis and evaluate its application in solid waste management.	***CO*** 3	***PO1***	**10**
			OR			
	10	a)	Evaluate the working principles of SEM-EDX and analyze their applications in solid waste management.	***CO*** 3	***PO1***	**10**
		b)	Analyze experimental techniques for solid-phase investigations of municipal solid waste, evaluating their effectiveness and potential improvements.	***CO*** 3	***PO1***	**10**

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