

U.S.N.

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

Autonomous Institute Affiliated to VTU

August 2024 Supplementary Examinations**Programme: B.E.****Branch: Civil Engineering****Course Code: 20CV6PESWM****Course: Solid Waste Management****Semester: VI****Duration: 3 hrs.****Max Marks: 100**

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)	Explain with schematic diagram, the classification of functional elements of a solid waste management system.				CO1	PO1	08
		b)	Estimate the energy content of a solid waste sample in unit energy content on dry basis and ash free dry basis. Assume Ash 5 %				CO1	PO2	08
			Component	% by mass	% moisture content	Energy (kJ/kg)			
			Food Waste	15	70	4650			
			Paper	45	06	16750			
			Cardboard	10	05	16300			
			Plastic	10	02	32600			
			Garden Trimmings	10	60	6500			
			Wood	05	20	18600			
			Tin cans	05	03	700			
		c)	Discuss Route Optimization				CO2	PO3	04
			OR						
	2	a)	With schematic diagram explain operational sequence of Hauled container system.				CO2	PO3	10
		b)	Outline the factors to be considered in the design of transfer stations.				CO2	PO3	10
			UNIT - II						
	3	a)	Discuss the 3T'S of Incineration process				CO1	PO4	05
		b)	Explain the Mechanical volume reduction and chemical volume reduction				CO1	PO4	10
		c)	Enumerate the design criteria for incineration				CO1	PO4	05

		UNIT - III			
4	a)	Explain the important factors for the design considerations in aerobic composting	CO1	PO4	10
	b)	Explain Bangalore method and indore method of composting	CO3	PO6	10
		UNIT - IV			
5	a)	Explain the various ways of control of gas movement in landfills.	CO3	PO6	08
	b)	Explain the area method and trench method of landfilling techniques stating merits and demerits.	CO3	PO6	08
	c)	Determine the landfill area required for municipality with a population of 50,000, given that: Solid waste generation = 350gm/person/day Compacted density of landfill = 504 kg/m ³ Average depth of compacted solid waste = 3 m	CO3	PO6	04
		UNIT - V			
6	a)	Explain the principles and application of SEM and TEM	CO3	PO6	10
	b)	Define XRD. Explain the diffraction principle and applications of XRD .	CO3	PO6	10
		OR			
7	a)	Define XRF. Explain the working principle and application of XRF	CO3	PO6	10
	b)	Define Raman Spectroscopy. Explain the working principle and application of XRF	CO3	PO6	10
