

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025

Integrated Waste Management for a Smart City

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.

2. M : Marks, L: Bloom's level, C: Course outcomes.

Module - 1				M	L	C																		
Q.1	a.	Explain the different sources and types of solid wastes.			10	L2	CO1																	
	b.	Discuss the physical and chemical properties of municipal solid waste.			10	L2	CO1																	
OR																								
Q.2	a.	Estimate the energy content of solid waste sample with the following composition. Assume moisture content = 21%, ash content = 5%. What is the energy content on dry basis and on ash free dry basis?			10	L3	CO1																	
		<table><tr><td>Component</td><td>Food waste</td><td>Paper</td><td>Plastic</td><td>Garden Trimming</td><td>Wood</td></tr><tr><td>% by mass</td><td>15</td><td>45</td><td>10</td><td>10</td><td>5</td></tr><tr><td>Energy content KJ/kg</td><td>4650</td><td>16750</td><td>32600</td><td>6500</td><td>18600</td></tr></table>	Component	Food waste	Paper	Plastic	Garden Trimming	Wood	% by mass	15	45	10	10	5	Energy content KJ/kg	4650	16750	32600	6500	18600				
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% by mass	15	45	10	10	5																			
Energy content KJ/kg	4650	16750	32600	6500	18600																			
	b.	With a neat sketch, explain the different methods of sanitary land filling.			10	L2	CO1																	
Module – 2																								
Q.3	a.	Explain aerobic and anaerobic composting methods with equation.			10	L2	CO2																	
	b.	Explain with a neat sketch Bangalore method and Indore method of composting.			10	L2	CO2																	
OR																								
Q.4	a.	Explain in detail about the MSW rules 2016.			10	L2	CO2																	
	b.	Explain in detail about Swachh Bharat Mission and Smart Cities program.			10	L2	CO2																	
Module – 3																								
Q.5	a.	With a neat sketch, explain fluidized bed incineration process. Discuss the factors affecting incineration process.			10	L2	CO3																	
	b.	Explain the energy recovery techniques from solid waste management.			10	L2	CO3																	
OR																								
Q.6	a.	Explain the current issues in solid waste management.			10	L2	CO3																	
	b.	Explain in brief about the MSW status in the first 20 listed smart cities in India.			10	L2	CO3																	
Module – 4																								
Q.7	a.	Define C & D waste. List and explain the various types of C & D waste generated from different types of sources.			10	L2	CO4																	
	b.	Explain historical background and Indian scenario of C & D waste.			10	L2	CO4																	
OR																								
Q.8	a.	Explain in detail about the C & D waste rules – 2016.			10	L2	CO4																	
	b.	Explain the benefits of recycling C & D waste materials.			10	L2	CO4																	
Module – 5																								
Q.9	a.	Explain the different types of E-waste and their impacts on environment.			10	L2	CO4																	
	b.	Describe the status of E-waste management in India and globally.			10	L2	CO4																	
OR																								
Q.10	a.	Explain in detail about E-waste management rules - 2016.			10	L2	CO4																	
	b.	Explain the treatment and disposal and challenges of handling E-waste.			10	L2	CO4																	