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CEL 794 Solid Waste Management

Major Examination Duration: 2Hrs

Please do not ask doubts. Assume any missing data / information and put it in a box in your answer script. Answer in brief avoiding lang essay style. Instead, give all points one after the other.

1. Explain briefly, how the lower level radioactive solid wastes generated from nuclear power plants are managed in India ?

(8 marks)

2. Presence of plasties in MSW and Biomedical waste is a blessing or a problem ? Discuss your opinion / opinions in detail.

(8 marks)

3. What do you understand by hazardous wastes ? How are they classified in India at present (use the most recent rules and regulations) ? **(8 marks)**

4. Explain the basic principle of 'Autoclave'. How is it different from a 'Hydroclave' ? which is more effective for waste management ? why ?

(8 marks)

5. Estimate the heat content of the MSW (characteristics given below) using Dulong's equation. Compare that with the heat content estimated using the values reported in the table. Give your comments on the heat contents. **(8 marks)**

Components	Wt. as discarded	% Moisture by Wt.	% Inerts by Wt.	Heat Content*
Paper	10.27 kg	7 %	6 %	15 000 kJ/kg
Cardboard	12.30 kg	6	5	15 000 kJ/kg
Glass	4.0 kg	3	97	
Plastics	1.50 kg	3	18	33 000 kJ/kg
Aluminium	0.13 kg	3	97	
Ferrous Metals	2.0 kg	3	97	
Food wastes	31.60 kg	52	9	5 000 kJ/kg
Dirt/ash	22.40 kg	8	92	

* Higher Heat Content 'as discarded' basis

6. Assess the above-mentioned MSW (Question No. 5) with respect to C/N ratio, whether it is suitable for aerobic composting or not. If it is not good, how do you make it suitable for aerobic composting ??

(5 marks)

Ultimate Analysis of the components of MSW (dry basis)

Components	% C	% H	% O	% N	% S	% ash
Paper	43.5	6	44	0.3	0.2	6
Cardboard	44	5.9	44.6	0.3	0.2	5
Plastics	60	7.2	22.8	-	-	10
Food wastes	48	6.4	37.6	2.6	0.4	5

Heat content = 32851 C + 141989 (H – O/8) + 9263 S