

(3 Hours)

[Total Marks: 80

- N.B.: 1) Question **number one** is **compulsory**.
 2) Attempt **any three** of **remaining five** questions.
 3) Assume **suitable data if required**.
 4) Draw **neat sketches** wherever **necessary**.

Q1 Attempt any **four**. (20)

- A) What is leachate? How it is formed?
- B) Write a note on material recovery facility.
- C) Explain the functional elements of Municipal Solid Waste Management.
- D) Explain factors affecting the generation rate of solid waste.
- E) Write a note on E- waste.

Q2 A) Explain Hauled container system and stationary container system with (10) neat sketches.

B) What are the characteristics of hospital waste and how it is treated and (10) Disposed off?

Q3 A) Estimate the moisture content of MSW sample with following (05) Composition

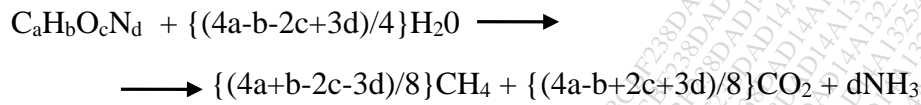
Component	% by mass	Moisture content %
Food waste	20	70
Paper	40	6
Cardboard	10	5
Plastic	10	2
Garden trimmings	10	60
Wood	5	20
Tin cans	5	3

B) Explain the sources of solid waste (05)

C) Explain factors affecting composting. Also explain types of (10) Composting with neat sketches.

TURN OVER

Q4 A) Determine the amount of methane gas generated from anaerobic digestion of 1 tonne of waste having composition $C_{55}H_{110}O_{35}N_2$. (10)



B) Explain with a neat sketch, working of Municipal Incinerator. (10)

Q5 A) Calculate the Energy content of the solid waste having following Composition using modified Dulong equation. (05)

Component	% by mass
Carbon	35
Hydrogen	10
Oxygen	40
Nitrogen	8
Sulphur	3
Ash	4

B) Describe various types of collection systems employed for House- to -house. State merits & demerits of each system. (10)

C) Explain sampling of solid waste (05)

Q.6 Write Short Notes on any **Four**. (20)

- A) Pyrolysis
- B) Volume Reduction of solid waste
- C) Refused Derived Fuel
- D) Legal aspects of solid waste disposal
- E) Hazardous Waste
- F) Transfer Station.