

(3Hours)

Max Marks=80

Note 1. Question No.1 is compulsory

2. Attempt any **three** questions from remaining **five** questions.
3. Assume any suitable data where ever required.
4. Figures to the right indicate full marks.

Q.1 Attempt any **four**

- a. What is E-waste? How they are managed? 05
- b. Explain significance of chemical properties of solid waste. 05
- c. What are the different characteristics of hazardous waste? 05
- d. Estimate density of solid waste sample from the given data. 05

Components	% by weight	Typical density(kg/m ³)
Food waste	25	290
Glass	5	195
plastic	15	65
Paper	13	85
Wood	25	240
Ferrous Metal	2	320
Miscellaneous	15	240

- e. What is called as optimization of collection route? 05

Q.2 a. Explain the factors affecting generation rate of solid waste. How solid waste generated can be reduced prior to minimum utilization of natural environmental resources. 10

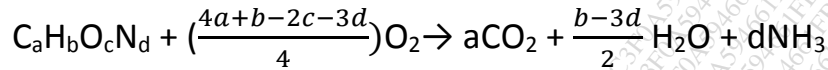
- b. Estimate the energy value of typical residential Municipal Solid waste with the average composition $C_{760}H_{1980}O_{875}N_{13}S_1$. 10

Q.3 a. With neat sketch explain collection of gases from sanitary landfill by two methods 10

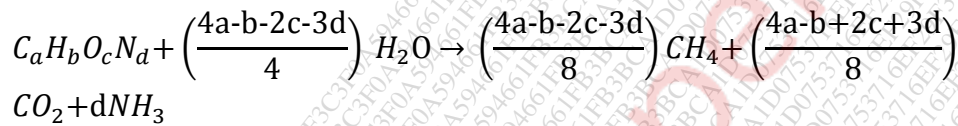
- b. Explain Hospital Solid waste with 10

- 1)Categories of waste
- 2)Quantities and composition
- 3)Storage
- 4)Transportation
- 5)Treatment and disposal

- Q.4 a. List the Engineering consideration involved in the implementation of ‘Material Recovery Facilities’. Give the flow diagram for material recovery facilities for processing yard and other green wastes. 10
- b. Determine the amount of air required to oxidize one tonne of waste with the chemical composition $C_{50}H_{100}O_{40}N_1$. 10



- Q.5 a. Why transfer stations are necessary? Explain any two types. 10
- b. Estimate the theoretical volume of methane gas that could be expected from anaerobic digestion of one tonne of waste having the composition of $C_{55}H_{110}O_{35}N_2$. 10



- Q.6 Write short note on **any four** 20
- Refuse Derived Fuel
 - Vermicomposting
 - Leachate control
 - Pyrolysis
 - Legal aspect of solid waste disposal
