



CBCS SCHEME

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17CV651

Sixth Semester B.E. Degree Examination, Jan./Feb.2021 Solid Waste Management

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Briefly explain the sources and types of municipal solid wastes. (08 Marks)
b. List the physical and chemical composition of municipal solid waste. (04 Marks)
c. Estimate the moisture content and density of 1000 kg solid waste sample using the data given in the table below:

Component	Mass by Percentage	Moisture content (%)	Density kg/m ³
Food waste	20	70	290
Paper	30	06	85
Plastics	10	02	65
Textiles	05	10	65
Leather	05	10	160
Wood	10	20	240
Glass	10	02	195
Garden Trimming	10	60	105

(08 Marks)

OR

- 2 a. Distinguish between hauled container system and stationary container system with a schematic diagram. (10 Marks)
b. Mention the factors to be considered for design of transfer stations and also explain the different types of transfer stations. (10 Marks)

Module-2

- 3 a. Explain 3Ts of incineration process. (06 Marks)
b. Briefly explain any four air pollution control methods adopted in an incineration process. (08 Marks)
c. Explain the processing techniques of mechanical volume reduction. (06 Marks)

OR

- 4 a. Mention the applications of different types of equipments used for mechanical size reduction. (08 Marks)
b. Explain the following component separation techniques:
(i) Air separation by chute type and zig zag classifier.
(ii) Magnetic separation by suspended magnetic and magnetic pulley.
(iii) Hand sorting.
(iv) Optical sorting. (12 Marks)

Module-3

- 5 a. What are the important design considerations for aerobic composting processes, briefly comment. (10 Marks)
- b. Determine the total amount of oxygen required to oxidize one tone of waste having the chemical equations $C_{50}H_{100}O_{40}N$. [Take unit weight of C = 12, H = 1, O = 16 and N = 14]

**OR**

- 6 a. Explain the various factors considered in the selection of a site for a sanitary landfill. (08 Marks)
- b. Explain area method of land filling techniques, with sketch. (04 Marks)
- c. Explain any two methods for control of gas movement in land fills with a schematic diagram. (08 Marks)

Module-4

- 7 a. List the various sources of bio-medical waste and also explain the following disposal methods:
- Chemical disinfection
 - Auto Claving.
 - Hydro claving.
 - Microwaving
- b. Mention the sources of e-waste and also explain the disposal methods. (10 Marks)

OR

- 8 a. Explain any five treatment categories of hazardous waste. (10 Marks)
- b. Discuss about sources, collection and treatment of construction waste. (10 Marks)

Module-5

- 9 a. Define incineration. Sketch and explain a typical municipal incinerator. (10 Marks)
- b. Define pyrolysis. Briefly explain the process of pyrolysis. (06 Marks)
- c. List out the design criteria for incineration. (04 Marks)

OR

- 10 a. Discuss the principal components involved in the recovery of energy. (04 Marks)
- b. With a flow sheet, explain the following energy-recovery systems:
- Steam turbine-generator.
 - Gas turbine generator. (16 Marks)
