

CBCS SCHEME

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15CV651

Sixth Semester B.E. Degree Examination, June/July 2018 Solid Waste Management

Time: 3 hrs.

Max. Marks: 80

- Note: 1. Answer any FIVE full questions, choosing one full question from each module.
2. Missing data if any, may be suitably assumed.**

Module-1

- 1 a. Briefly explain physical and chemical characteristics of solid waste. (10 Marks)
b. From the following data estimate the waste generation rate per day for a residential area consisting of 1200 houses. The observation location is a local transfer station that receives all the waste collected for disposal. The observation period is for one week. Assume 5 persons in each house. (06 Marks)

| Vehicle type | No. of loads | Vol. of vehicle (m ³) | Sp. Wt. of solid waste (kg/m ³) |
|---------------------|--------------|-----------------------------------|---|
| Compactor truck | 10 | 15.30 | 296.50 |
| Flat bed load | 08 | 1.53 | 133.40 |
| Private cars/trucks | 25 | 0.23 | 88.90 |

OR

- 2 a. With a neat sketch, explain the operational sequence of Hauled Container System. (08 Marks)
b. Estimate the moisture content, bulk density and energy content of 1000kg sample of solid waste with the following composition. Also estimate energy content on dry weight basis and on ash free dry basis. Take ash content as 7 percent. (08 Marks)

| Component | Food waste | Paper | Cardboard | Plastics | Wood |
|--------------------------------|------------|-------|-----------|----------|-------|
| % by mass | 45 | 5 | 15 | 15 | 20 |
| Moisture % | 70 | 6 | 5 | 2 | 20 |
| Bulk density kg/m ³ | 290 | 85 | 50 | 65 | 240 |
| Energy content kJ/kg | 4650 | 16750 | 16300 | 32600 | 18600 |

Module-2

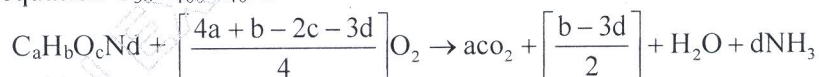
- 3 a. Explain with a neat sketch, working of a municipal incinerator. (08 Marks)
b. Explain briefly the following processing technique : (08 Marks)
i) Mechanical volume reduction ii) Mechanical size reduction.

OR

- 4 a. Explain briefly the following component separation techniques : (08 Marks)
i) Magnetic separation ii) Air separation.
b. Write a short note on following : (08 Marks)
i) Garbage chutes ii) Bailing and Compaction.

Module-3

- 5 a. Explain the factors that governs the selection of site for sanitary land filling. (08 Marks)
b. Determine the amount of air required to oxidize one tone of waste having the chemical equation C₅₀H₁₀₀O₄₀N. (08 Marks)



1 of 2

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8=50, will be treated as malpractice.

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OR

- 6 a. Explain with neat sketch, Indore process and Bangalore process of composting of municipal solid waste. (08 Marks)
- b. Determine the landfill area required for municipality with population 50,000. given that, (08 Marks)
- i) Solid waste generation rate = 450 gm/person/day.
- ii) Compacted density of landfill = 504 kg/m³.
- iii) Avg. depth of compacted solid work = 5mt.

Module-4

- 7 a. Define Hazardous waste. Explain briefly about collection and disposal of hazardous waste. (08 Marks)
- b. Explain the characteristics of Bio – medical waste and its disposal method. (08 Marks)

OR

- 8 a. Briefly explain about E – Waste and its environmental significance. (08 Marks)
- b. Explain briefly about reuse of construction and demolition waste in Construction Industry. (08 Marks)

Module-5

- 9 a. What are 3Ts of incineration process? Explain briefly. (08 Marks)
- b. Define Pyrolysis. Briefly explain about process of Pyrolysis. (08 Marks)

OR

- 10 a. Explain with a flow diagram, energy recovery system from solid waste. (08 Marks)
- b. Define Incineration. Explain briefly about air pollution control methods adopted in an incineration process. (08 Marks)

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