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10CV757

Seventh Semester B.E. Degree Examination, June/July 2019
Solid Waste Management

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting atleast TWO questions from each part.

PART - A

- 1 a. Explain the classification of Municipal solid waste. (10 Marks)
b. Estimate the energy content of solid waste sample, with the following composition. Assume moisture content = 21% , Ash content = 5%. What is the energy content on dry basis and on ash free dry basis? (10 Marks)

Table with 8 columns: Component, Food waste, Paper, Card board, Plastic, Garden Trimming, Wood, Tin cans. Rows include % by mass and Energy content kJ/kg.

- 2 a. Explain briefly the factors affecting the generation of solid waste. (08 Marks)
b. From the following data estimate the waste generation rate per day for a residential area consisting of 1200 houses. (06 Marks)

Table with 4 columns: Vehicle Type, No. of loads, Volume of vehicle (m³), Specific weight of solid waste (kg/m³). Rows include Compactor truck, Flat bed load, Private cars/trucks.

- c. Explain with neat sketch, the operational task adopted with hauled container system in collection process of municipal solid waste. (06 Marks)
3 a. Explain the parameter 3T's factor affecting the incineration process. (10 Marks)
b. What is Pyrolysis? Briefly explain the process of pyrolysis. (10 Marks)
4 a. Explain briefly the processing techniques involved in the treatment of municipal solid waste as well as material recovery. (10 Marks)
b. Explain briefly, the different techniques of component separation. (10 Marks)
i) Garbage chute ii) Route optimization technique.

PART - B

- 5 a. Discuss the factors affecting the anaerobic composting process. (10 Marks)
b. Explain briefly Bangalore process of composting. (10 Marks)
6 a. Explain area method and trench method of land filling techniques. (10 Marks)
b. With neat sketch, explain the methods of controlling gas movement, with vents and barriers. (10 Marks)

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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- 7 a. Explain the formation of leachate in the landfill. (10 Marks)
- b. Determine the landfill area required for municipality, with population 50,000. Given that
- i) Solid waste Generation = 450 gm/person/day.
 - ii) Compacted density of landfill = 504 kg/m³.
 - iii) Average depth of compacted solid waste = 5. (10 Marks)
- 8 Write short notes on :
- a. Transfer station.
 - b. Vermi composting.
 - c. Biomedical waste disposal methods.
 - d. Mechanical volume reduction. (20 Marks)
