



P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Sixth Semester, B.E. - Civil Engineering

Semester End Examination; May / June - 2019

Municipal Solid Waste Management

Time: 3 hrs

Max. Marks: 100

Note: Answer FIVE full questions, selecting ONE full question from each unit.

UNIT - I

- 1 a. Define solid waste. Explain the different classification of solid waste. 10
- b. List and explain the functional elements of solid waste management. 10
- 2 a. Explain material flow in a technological society with a flow diagram. 10
- b. Enumerate briefly the properties of solid waste, such as density, moisture content, particle size, chemical properties, conductivity etc. 10

UNIT - II

- 3 a. Draw the schematic diagram of operational sequence for handled container system and define the activities involved in it. 10
- b. Estimate the moisture content, density and energy content of the solid waste sample using the data give below :

Component	Percent by mass	Moisture content %	Density* kg/m ³	Energy** kJ/kg
Food waste	12	70	290	4650
Paper	40	06	85	16750
Card board	08	05	50	16300
Plastics	04	02	65	32600
Grass trimmings	15	60	105	6500
Wood	05	20	240	18000
Tins	16	03	90	700

* Based on 1000 kg sample

** Based on 100 kg sample

- 4 a. Explain briefly the various units operations or methods used for the separation and processing of waste materials. 10
- b. With the aid of a neat diagram, explain magnetic separation technique used for separation of ferrous metals from community waste. 10

UNIT - III

- 5 a. Discuss briefly the important factors that can affect aerobic composting. 10
- b. With a neat sketch, explain the working of Incinerator in treating municipal solid waste. 10
- 6 a. With a neat sketch, explain vermi composting for treating solid wastes. 10
- b. List and explain briefly, the design factors to be considered for an incinerator for solid waste treatment. 10

UNIT - IV

- 7 a. Discuss briefly the site selection criteria involved in controlled disposal of solid wastes on landfills. 10
- b. Write a note on gases in landfill and control of gas movements. 10
- 8 a. With neat sketches, explain the different method of land filling. 10
- b. What is Leachate? Discuss the different controls adopted for Leachate movement in a sanitary land fill. 10

UNIT - V

- 9 a. Define and classify biomedical waste based on sources. 10
- b. List and explain briefly different types of thermal processing of municipal solid wastes. 10
- 10 a. Write short notes on :
- i) Pyrolysis 10
- ii) Metal recovery from solid waste
- b. Explain the importance of 3 R concept in managing wastes. 10

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