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

(An Autonomous Institution affiliated to VTU, Belagavi)

Eighth Semester, B.E. - Civil Engineering

Semester End Examination; July - 2021

Municipal Solid Waste Management

Time: 3 hrs

Max. Marks: 100

Note: Answer any FIVE full questions

- 1 a. Explain the functional elements of solid waste management with a neat sketch. 10
- b. Discuss the physical, chemical and biological characteristics of municipal solid waste. 10
- 2 a. Explain the impact of solid waste on the environment. 10
- b. Explain the methods of quantification of solid waste. 10
- 3 a. Write a note on merits and demerits of HCS and SCS. 10
- b. Estimate the energy value of typical solid waste with composition as- $C_{762} H_{1982} O_{874.9} N_{12.7} S_1$ 6
- c. Discuss about the location of transfer station. 4
- 4 a. Explain the various separation techniques. 12
- b. Estimate the moisture of a sample as collected residential SW with the typical composition given in the table.

Waste composition	Food waste	Paper	Cardboard	Yard waste	Wood	times
% by weight	15	45	10	10	5	5
Moisture content (%)	70	6	2	60	20	3

- 5 a. With a neat sketch, explain the fluidized bed combustion for RDF [Refuse Derived Fuel]. 10
- b. Discuss the factors affecting the composting process. 10
- 6 a. What is Indore process and Bangalore process? Which method is preferred in organic SW disposal and why? 10
- b. Explain in detail the anaerobic digestion of solid waste. 10
- 7 a. Discuss briefly about the leachate movement and collection in landfills along with sketch 10
- b. Enumerate the factors that must be considered in the design and operations of SW landfills. Explain any two. 10
- 8 a. With a neat sketch, explain the sanitary landfills methods of SW disposal. 10
- b. Describe about the gas collection from landfills with a neat sketch. 10
- 9 a. Explain how 3R technology is suitable for SWM? 10
- b. Under what circumstances, incineration method is adopted? Explain its working principle. 10
- 10 a. Explain the energy recovery systems used for production of electricity with a flow diagram. 10
- b. Briefly outline the important factors that must be considered in the storage, segregation and handling of Biomeical wastes. 10