VALLIAMMAI ENGINEERING COLLEGE
CE2039 – MUNICIPAL SOLID WASTE MANAGEMENT
QUESTION BANK

UNIT I

PART A

1. What is solid waste management
2. What are the essential reasons for an analysis of the composition, characteristics and quantities of solid wastes?
3. Write about the interrelationship of the functional elements in a solid waste management system.
4. Explain about the public health and aesthetic considerations in solid waste management system.
5. Define solid waste and a hazardous waste in general terms. What materials do they include?
6. List public health and environmental effects due to improper handling of solid waste.
7. Classify the solid waste based on sources.
8. What are the sources of domestic solid waste
9. State the key role of public in solid waste management.
10. Define Garbage.
11. What are the functional elements in a typical solid waste management system?
12. What are the factors that contribute to variation in composition of solid waste?
13. What are the constituents of MSW?
14. Explain: industrial solid wastes and hazardous wastes.
15. How to determine the moisture content of MSW.
16. Name any 4 hazardous wastes.
17. Define white goods and Bulky items.
18. What is the various legislation for MSW?
19. What is the nature of MSW?

PART B

1. Describe the waste management hierarchy. Explain the functional elements in a waste management system.
2. Using the data for a MSW sample provided below, determine the average moisture content of the sample. Base your calculations on a 100 kg sample size.

component	Moisture content (%)	Weight (%)
Paper waste	7	25
Yard waste	55	18
Food waste	65	20
Plastic	2	5
Wood	20	8
Glass	3	7
Metals	3	9
Textiles	12	8

3. Explain the methods of sampling and characterization of solid wastes as per MSW
4. Explain how and why the generation rate of waste has increased over a period of 10 years
5. MSW is generated within the community from several sources, not just the household. Classify the solid waste based on sources and types. Discuss the factors that contribute to variation in composition of solid waste.

6. What is meant by solid waste management? Explain the functional elements that are needed for solid waste management with neat sketch.
7. Estimate the moisture content of a solid waste sample with the following of a solid waste sample with the following composition. Base your calculations on a 100 kg sample size.

components	% by mass	Moisture content
Food waste	15	70
Paper	45	6
Cardboard	10	5
Plastics	10	2
Garden trimmings	10	60
Wood	5	20
tincans	5	3

8. (a) State the composition of MSW. Describe the compositions.
   (b) Describe the sampling procedure for solid waste characterization
9. (a) Explain the factors influencing solid waste generation
   (b) Discuss the importance of public awareness and role of NGOs in effective solid waste management.
10. Explain the adverse health and environmental impacts due to improper handling of MSW.
11. Enumerate the classification of solid wastes based on its composition and characteristics.
12. (a) Explain the various types of solid wastes in detail.
    (b) Discuss the physical and chemical composition of solid wastes.
13. Discuss the possibilities in solid waste management with respect to reduction, reuse and recovery.
14. Briefly discuss the factors affecting solid waste generation in a city.
15. State & explain the various environmental legislation for MSW.
16. Explain physical, chemical &biological properties of MSW.

UNIT II

PART A

1. List out the methods for the primary collection of waste stored at various sources of waste generation.
2. What are the various stages at which sorting can takes place in the waste stream?
3. What are the text storage options for Indian refuse?
4. What are the major recoverable materials present in the MSW?
5. List the key components of the receiving area of an MSW processing facility?
6. What are the advantages to using a shredder for MSW processing in a MRF? What are the disadvantages?
7. What is the purpose of source of reduction?
8. What are the factors that have to be considered while evaluating the residential waste containers?
9. List out different purposes onsite processing.
10. What is meant by mechanical collection of solid wastes?
11. List out the factors causing variation of solid waste generation.
12. What is recovery and recycling of solid waste? List out the operations involved in recycling?
13. List out the functional elements for solid waste management?
14. What is the importance of waste stream assessment?
15. List out some domestic hazardous waste?

16. What are options for selection of container?
17. What are the impacts of house hold waste storage in tropical country?
18. What is the legal requirement in India regarding onsite storage and collection of MSW?
19. Enumerate the biological properties of solidwaste
20. When will you recommend a hauled container system?
21. When will you prefer stationary container system?

PART B

1. What are the careful considerations for a design of an efficient storage container?
2. What is magnetic separation of solid waste? Explain process for magnetic separation? What are the factors influence the effectiveness of magnetic separation?
3. Explain why handling and storage of solid waste varies in urban and rural areas?
4. Explain on-site segregation techniques suitable for Indian refuge and justify it?
5. What are the factors that should be considered in evaluating onsite processing equipment? Explain the various equipments used for magnetic separation?
6. Explain the difference between compaction and size reduction and their importance in solid waste management. Explain the types, mode of action, and applications of equipments used for size reduction and component separation in detail.
7. Explain the types of waste collection systems based on their mode of operation with a neat sketch.
8. Explain the types of vehicle and the requirement of vehicle for transportation of solid waste.
9. List out the factors influencing equipment selection for on-site processing of solid wastes.
10. Describe the on-site processing of solid wastes in medium and high rise buildings.
11. Explain the different on-site process on solid waste.
12. Identify the activities responsible for successful implementation of collection system. What are the rules to be kept in mind while designing the collection route?
13. Explain the types, mode of action, and application of equipment used for component separation.
14. Describe the various methods of sorting the solid waste.
15. Discuss the ways of sorting the solid waste at various sources of generation
16. Explain in detail the different types of collection systems based on the mode of operation
17. List out measures to be taken by the local bodies towards segregation of recyclable waste.
18. What are the considerations in the selection of material and capacity of storage containers
19. What is meant by proximate analysis and ultimate analysis of solid waste.

Unit – III

PART – A

1. What are the criteria for selection of location for transfer stations?
2. Mention the types of vehicles in MSW collection.
3. Differentiate stationary and hauled container system
4. What is meant by transfer station?
5. What are the components of waste collection system?
6. Mention the two separate components for routing procedures?
7. List out the desirable characteristics of a well designed container.
8. Define motion time measurement (MTM)
9. Classify the collection systems based on mode of operation
10. What do you meant by “at – site” in solid waste collection?
11. What are the factors to be considered deciding collection frequency in a SWM system?

12. Identify the activities responsible for successful implementation of collection and transfer system?
13. What are factors affecting the compositing process.
14. List out the physical and chemical parameters considered for energy recovery from MSW.
15. What are the activities done at solid waste transfer station
16. List 4 factors to be considered while comparing different waste collection systems
17. What is the role of transfer station in MSW management!

PART- B

1. Explain the routing guide lines to footing vehicles
2. Discuss the types of transfer stations and the benefits of transfer stations that affect community in terms of economics, time savings and environmental quality.
3. What is the need for transfer operation? Also explain the functions of transfer stations.
4. What are the various factors to be considered while selecting solid waste disposal site? Explain.
5. What are the types of containers and collection vehicles used for the collection of solid waste? Explain the solid waste collection practice and discuss its role in waste management.
6. Explain the role of transfer station in solid waste management. Discuss the benefits of transfer station to a community in terms of economics, time, savings and the environmental quality?
7. Explain the routing guidelines to formulate a suitable route for collection vehicles? Sketch the routing pattern for one way street collection and three block configuration?
8. Briefly explain the types of transfer station and what are the factors to be addressed when considering a potential site for transfer station
9. a) Discuss the various methods of house – to house solid waste collection and their advantage
   b) State and brief the factors influencing site selection for a transfer station.
10. Explain the methods of collection of solid waste from a source of generation
11. Describe the types of vehicle and the requirement of vehicle for transportation of waste
12. Write detailed note on

a) Nuisance caused by garbage loaded open trucks on high way
b) Setting up transfer station

13. Compare the operation of hauled container system and stationary container system of waste collection? How will you analyze the waste collection operations?
14. Explain the steps in assessing the need for a transfer station. List the facilities expected at a transfer station.
15. What is meant by “at site”, “off route” and “pick u” in the analysis of solid waste collection?
16. Briefly outline the important factors that must be considered in the storage, labeling ad handling of hazardous waste.

UNIT – IV

PART-A

1. How does composting work?
2. How can an incinerator help reduce pollution?
3. Define composting
4. Why is source reduction required in waste management?
5. What is the significance of recycling?
6. What is meant by Pyrolysis?

7. Mention the various type of incinerator
8. Describe pyrolysis and incineration
9. List 4 factors to be considered while comparing different waste collection systems
10. What is the role of earth worms in vermin composting?
11. List out the benefits associated with leachate recirculation in landfill bioreactors.
12. What is the use of daily cover in a landfill?
13. What is a hazardous waste?
14. What is a bio medical waste?
15. What is the use of daily cover in a landfill?
16. What is a hazardous waste?
17. What is a bio medical waste?

PART- B

1. Draw a flow chart showing the steps involved in the aerobic composting process. Explain the factors affecting composting process.
2. Discuss the major types of gaseous emissions from a mass burn incinerator and how each may be effectively removed from flue?
3. Explain the classifications of compensating technologies and discuss briefly the basic steps involved in the compensating process.
4. How does incineration help in the management of solid waste? Describe the incineration technologies and air emissions and its control in detail.
5. Explain the various options for the disposal of solid wastes and the relative merits of disposal options
6. Describe the incineration technologies and air emissions and its control in detail
7. Explain composting process of bio degradable MSW
8. Draw schematic diagram of a in-line multiplier chamber incinerator and specify the parts.
9. Write short notes on

i) Composting micro biology
ii) Gases in sanitary landfill
iii) Air pollution problems in incineration process

10. Explain the components and operations of a window composting facility
11. Discuss the factors affecting waste composting and the methods of its control.
12. What are the objectives of waste processing?
13.

i) Describe the factors to be considered in the selection of waste processing equipments.
ii) What are the important factors affecting composting? How they are controlled during composting?

14.

i) Briefly outline the different waste to energy options for management of solid and hazardous waste.
ii) What are the important factors affecting composting? How they are controlled during composting?

15. Explain briefly about various magnetic separators with neat sketches
16. Explain with neat sketches about the pyrolysis and incineration – pyrolysis process?

UNIT – V

PART – A

1. Can u build anything on a landfill after it is closed?

2. What happens to garbage after it is put into a landfill?
3. What are the factors which affect production of leachate and landfill gas in the landfill?
4. Define leachate and landfills
5. What is biomedical waste
6. List the various gases generated in sanitary landfill?
7. How to minimize leachate generation in a sanitary landfill?
8. Which types of MSW are permitted for land filing as per Indian regulations?

PART – B

1. Explain the various phases of MSW decomposition in a closed landfill cell. How do leachate and gases differ b/w each phase? What are the factors which affect production of leachate & landfill gas?
2. What are the issues should be considered before deciding on gas ventilation from a landfill? Explain a typical gas vents used in the surface of a landfill for the control of landfill gas.
3. Explain the various phases of MSW decomposition in a closed landfill cell.
4. Identify the adverse effects of a landfill leachate and list appropriate control measures.
5. Explain the various methods of leachate treatment.
6. Explain in detail the important aspects in the implementation of sanitary landfill.
7.

i) What are the environmental factors in sanitary landfill sites?
ii) Discuss the different methods used for MSW landfill.

8. With the help of a neat sketch, compare the cross section of liner systems, and cover systems recommended for sanitary landfill.
9.

i) Explain the step by step procedure involved in site selection for sanitary landfills
ii) With the help of a neat sketch explain the essential components of a sanitary landfill and their functions. Also explain its advantages and disadvantages of sanitary landfill.

10.

i) Enlist the key characteristics of an engineered landfill that distinguishes it from an open dump.
ii) With the help of a neat sketch describe the operational components of a landfill and state their functions.

11.

i) Elaborate the post closure care required for a secure landfill
ii) List out the factors that must be considered in identification of potential site for a secure landfill. Describe site selection procedure.

12. Explain briefly about the various characteristics of hazardous wastes.