Code No: **RT42013B** **R13** **Set No. 1**

IV B.Tech II Semester Regular/Supplementary Examinations, April - 2018

SOLID WASTE MANAGEMENT

(Civil Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B
*****

PART–A *(22 Marks)*

1. a) List the sources of domestic solid waste. [3]
   b) Distinguish between solid waste and hazardous waste. [4]
   c) Compose the biological properties of solid waste. [3]
   d) Compose the two separate components of routing procedure. [4]
   e) What is meant by pyrolysis? [4]
   f) Explain waste landfill remediation.. [4]

PART–B *(3x16 = 48 Marks)*

2. a) Discuss about the factors influencing the generation of solid waste. [8]
   b) Describe and list the various environmental legislation for solid waste. [8]

3. a) Write about the interrelationship of the functional elements in a solid waste management system. [8]
   b) Discuss in detail about the collection system based on mode of operation. [8]

4. Solid waste is collected from a locality using a stationary container system, provided with two containers each of size 4 cubic meters and utilization factor of 0.75, at each location. The truck takes 20 min to reach to first container from garage. Six minutes are spent for unloading each container into the truck and average time taken by the truck to cover the distance between consecutive container locations is also 6 minutes, the round trip haul distance is 60 km and the truck takes 15 minutes to reach the garage from last container location. Estimate the required capacity of the truck if the number of trips to disposal site per day is 2 (8 hours workday). Speed limit of truck is 40 kmph and collection vehicle compaction ratio is 2.5. [16]

5. a) What are the common techniques for material separation? What are its advantages? [8]
   b) Explain the necessity of source reduction in solid waste management. [8]

6. a) Investigate the various process techniques applied for Indian environmental conditions. [8]
   b) List out various gases emitted from incineration process. [8]

7. a) Write the adverse effects of a landfill leachate and list appropriate control measures. [8]
   b) Describe the sanitary land filling process with neat sketch. [8]

Code No: **RT42013B** **R13** **Set No. 2**

IV B.Tech II Semester Regular/Supplementary Examinations, April - 2018

SOLID WASTE MANAGEMENT

(Civil Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B
*****

PART–A *(22 Marks)*

1. a) Classify the solid waste based on sources. [4]
   b) Explain the optimization of collection routes. [4]
   c) What is the role of transfer station in solid waste management? [3]
   d) Outline pyrolysis and incineration. [4]
   e) Briefly outline about Bangalore method of composting and neighbourhood composting. [4]
   f) What are advantages of using geomembrane as a liner? [3]

PART–B *(3x16 = 48 Marks)*

2. a) Discuss about the various objectives of solid waste management. [8]
   b) Describe the various environmental legislation for municipal solid waste. [8]

3. a) Explain the functional elements that are needed for solid waste management with a neat sketch. [8]
   b) Describe the operation of hauled container system of waste collection. [8]

4. Discuss the issues involved in selecting a site for a solid wastes transfer facility. How should the civic authorities deal with the NIMBY syndrome. [16]

5. a) Give suitable techniques for separation of paper, glass, metals and inert materials. [8]
   b) What are the unit preparations used for separation and transformation of solid waste. Discuss. [8]

6. a) Illustrate the facilities needed for air pollution control due to incinerator. [8]
   b) Briefly discuss
      i) Vermicomposting
      ii) In vessel composting. [8]

7. a) Illustrate the problems posted by leachate and examine how to overcome it [8]
   b) Discuss about environmental factors in sanitary landfill sites. [8]

Code No: **RT42013B** **R13** **Set No. 3**

IV B.Tech II Semester Regular/Supplementary Examinations, April - 2018

SOLID WASTE MANAGEMENT

(Civil Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B
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PART–A *(22 Marks)*

1. a) Outline the key role of public in solid waste management. [3]
   b) What are types of screens used for size separation? [4]
   c) List the factors to be considered while comparing different waste collection systems. [4]
   d) Explain what happens to garbage after it is put to a landfill. [3]
   e) How do you select a disposal yard? [4]
   f) What are the physical and chemical changes that take place in a landfill during its life? [4]

PART–B *(3x16 = 48 Marks)*

2. a) Describe the effects of solid waste on human health and environment. [8]
   b) Explain the methods of sampling and characterization of solid wastes. [8]

3. a) Compose the functional elements in atypical solid waste management system. [8]
   b) Explain the factors influencing solid waste generation. [8]

4. a) With neat sketches explain different types of transfer stations. [8]
   b) Describe the operation of hauled container system and stationary container system of waste collection. [8]

5. a) Discuss about the common techniques used for material separation. What are its advantages. [8]
   b) Explain the necessity of waste minimization and source reduction. [8]

6. a) What is the basic difference between pyrolysis and gasification? Give suitability of these techniques in practice. [8]
   b) Describe various types of incinerations and the factors affecting their efficiency. [8]

7. a) Design a suitable environmental monitoring system for a sanitary land fill site in your city zone. Sketch the main monitoring components. [8]
   b) What are the major contaminants in a leachate. Give their typical values. [8]

Code No: **RT42013B** **R13** **Set No. 4**

IV B.Tech II Semester Regular/Supplementary Examinations, April - 2018

SOLID WASTE MANAGEMENT

(Civil Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B
*****

PART–A *(22 Marks)*

1. a) What factors will be influencing the generation of solid waste? [3]
   b) Classify the constituents of municipal solid waste. [4]
   c) What are the methods of collection system adopted in solid waste? [4]
   d) Explain the process of pyrolysis. [3]
   e) Discuss about shredding and pulverizing. [4]
   f) Mention the various parameters to be taken in a disposal yard. [4]

PART–B *(3x16 = 48 Marks)*

2. List the essential reasons for the analysis of composition, characteristics and quantities of solid wastes. [16]

3. a) Explain the methods of collection system adopted in solid waste. [8]
   b) Compare and contrast the two separate components for routing procedure. [8]

4. Describe various types of vehicles used for transportation of solid waste. Give their advantages and disadvantages. [16]

5. a) Propose a recycling strategy for wastes from a residential area. [8]
   b) For an ideal recycling and recovery program of solid wastes, estimate the residuals that will need to be ultimately disposed off in landfill. [8]

6. a) Explain the anaerobic methods for materials recovery and treatment. [8]
   b) What are the various wastes processing systems? Give their suitability for processing of different types of wastes components. [8]

7. Design a leachate treatment system for a landfill receiving municipal solid waste. What are the standards prescribed by CPCB for disposal of leachate on land, in river or in sewers. Give the block diagram of a leachate treatment system and name all the units. [16]