

Code No: **RT42013B****R13****Set No. 1****IV B.Tech II Semester Regular/Supplementary Examinations, April/May - 2019****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) Give the characteristics of a solid waste from a town of population one lakh. [4]
- b) Distinguish between collection systems in India Vs Developed countries. [4]
- c) Discuss current practices of e-waste management in India. [3]
- d) Outline pyrolysis and incineration. [4]
- e) What are the design parameters of a WTE (Waste To Energy) plant? [3]
- f) Explain the chemical changes that will take place in a landfill during its life. [4]

**PART-B (3x16 = 48 Marks)**

2. a) Explain various environmental legislation regarding solid waste. [8]
- b) Discuss various goals and objectives of solid waste management. [8]
3. a) Discuss 'Optimization of Collection Routes' with special reference to Environmental aspects. [8]
- b) What are the differences between hauled container system and stationary container system? [8]
4. a) With neat sketches, explain different types of transfer stations. [8]
- b) Explain the methods of dealing by civic authorities with the NIMBY syndrome. [8]
5. a) Explain the terms 'Salvage and Segregation' and give their applications in different stages of Solid Waste Management. [8]
- b) Propose a recycling strategy for wastes from a residential area. [8]
6. a) Explain the anaerobic methods for material recovery and treatment. [8]
- b) Briefly discuss:
  - (i) Vermi composting
  - (ii) In vessel composting[8]
7. a) Design and describe a 'Sanitary Landfill' for a coastal town of population 4 lakh. [8]
- b) Give the block diagram of a leachate treatment system and name all the units. [8]

Code No: **RT42013B****R13****Set No. 2****IV B.Tech II Semester Regular/Supplementary Examinations, April/May - 2019****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) Enumerate the physical & biological characteristics of solid waste. [4]  
b) Differentiate between refuse and garbage. [4]  
c) Mention merits & demerits of aerobic and anaerobic composting of solid waste. [4]  
d) Explain the process of pyrolysis. [3]  
e) What is 'Salvage' and what are its applications in Solid Waste Management? [3]  
f) Design a 'Landfill' for 'AMARAVATI'. [4]

**PART-B (3x16 = 48 Marks)**

2. a) Define and classify the solid wastes. Describe source of solid waste generator and type of waste. [8]  
b) Explain methods of sampling and characterization of solid wastes. [8]
3. a) What are the various points to be kept in mind while choosing the collection route of vehicle to pick up solid waste? [8]  
b) What are the methods of on site storage and handling of solid waste? [8]
4. a) What are the various facilities that must be available at transfer station? [8]  
b) Describe the operation of hauled container system and stationary container system. [8]
5. a) Discuss about the common techniques used for material separation. [8]  
b) Discuss 'Source Reduction Methods' in India Vs Developed countries. [8]
6. a) Design a WTE (Waste To Energy) plant for Krishna and Guntur Districts together. Mention various design parameters assumed. [8]  
b) Write short notes on  
(i) Bangalore method (ii) Indore method of composting. [8]
7. a) What do you understand by Waste-to-Energy (WTE) technologies for municipal solid waste? [8]  
b) What are the various phases of operation of a landfill? Draw the neat sketch of a landfill. [8]

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## Set No. 3

**IV B.Tech II Semester Regular/Supplementary Examinations, April/May - 2019**

# 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) Give the Total Quantity and % Composition of Solid Waste from a town of population 1 lakh. [4]
  - b) What is the role of IT in Solid Waste Management? [4]
  - c) How do you keep the hazardous wastes separately from other wastes? [4]
  - d) Mention the factors considered for the choice of disposal method. [4]
  - e) Explain about Indore method of composting. [3]
  - f) How does geomembrane add advantage to be used as a liner? [3]

**PART-B** (3x16 = 48 Marks)

2. a) Give any Eight important design principles of Solid Waste Management, with numerical and units. [8]  
b) Distinguish between various Collection and Transport systems in India Vs Developed Countries. [8]
3. a) Explain the principle of optimization of collection routes. [8]  
b) Compose the fundamental elements in a typical solid waste management system. [8]
4. a) Describe in detail the methods of collection system with flow diagram and the type of vehicle used for collection system. [8]  
b) What are the various facilities that must be available at transfer station? [8]
5. a) Discuss 'Source Reduction Techniques' for a city of population 5 lakh. [10]  
b) What is 'Salvage'? What are their applications in an integrated Solid Waste Management? [6]
6. a) What is composting? Discuss various processes and phases of composting. [8]  
b) Design and describe WTE (Waste To Energy) Plant for East Godavari District of Andhra Pradesh. [8]
7. a) What do you understand the term Leachate? What are the problems posed by Leachate and how would you overcome them? [8]  
b) Draw the diagram of double liner system of landfill and explain the functions of various components. [8]

## Set No. 4

**IV B.Tech II Semester Regular/Supplementary Examinations, April/May - 2019**

## 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) Explain classification of solid wastes based on sources. [4]
- b) What are the capacities of various Collection and Transport Systems? [3]
- c) Discuss the ultimate disposal of hazardous wastes. [4]
- d) Explain pyrolysis and Incineration. [4]
- e) Outline the Bangalore method of composting. [4]
- f) Mention the essential components of a secured landfill. [3]

**PART-B** (3x16 = 48 Marks)

2. a) Describe the functional elements of solid waste management program. [8]  
b) Discuss various characteristics of municipal solid waste. [8]
3. a) Design the Collection System for Kakinada. [8]  
b) How do you fix up the collection route of vehicle to pick up solid waste? [8]
4. With the help of line sketches and numericals, design and describe the 'Transfer and Transport' System for a coastal town of population One lakh. [16]
5. a) Explain the terms 'Salvage and Shredding'. What are their applications in an Integrated SWM? [8]  
b) Explain necessity of source reduction and waste minimization in solid waste management. [8]
6. a) Explain with sketches about  
(i) Anaerobic digestion (ii) Incineration [8]  
b) Describe the techniques of energy recovery from municipal solid waste. [8]
7. a) Design a suitable environmental monitoring system for a sanitary landfill site with sketch and components. [8]  
b) What is Leachate? What are the problems posed by Leachate and how would you overcome them? [8]