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 refuge 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 if 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]

Code No: **RT42013B** **R13** **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]

Code No: **RT42013B** **R13** **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]