

Name of the Examinations: M. TECH. ENVIRONMENTAL BIOTECHNOLOGY 2<sup>ND</sup>. SEM. EXAM.-2018**Subject: SOLID AND HAZARDOUS WASTE MANAGEMENT**

Time : Three hours

Full Marks : 100

Use a separate Answer-Script for each part

**PART - I ( 60 MARKS )**

Q. No.	Questions	Marks
	<b>Answer any four questions :</b>	<b>15 × 4 = 60</b>
1.	a) Define the role of different steps involved to maintain a healthy solid waste management system. b) Open burning of waste is not eco-friendly – explain.	12 + 3
2.	a) Define the different classes of available hazardous waste on earth surface. b) Proper handling is very essential as far as hazardous waste is concerned – explain. c) Physical and chemical treatment of hazardous waste can be recommended for its safe disposal or detoxification –justify.	3 + 4 + 8
3.	a) Brief the advantages and disadvantages of composting and incineration processes during solid waste disposal. b) How sanitary landfill differs from secure landfill? c) How thermochemical conversion can be useful during energy recovery process from solid waste.	6 + 3 + 6
4.	a) How various factors influence the composition of solid waste generation? b) Effectiveness of composting process depends on several environmental factors – explain.	5 + 10
5.	a) A solid waste landfill can be thought of as a biochemical reactor - Justify. b) How to control the migration and emission of landfill gas? c) Brief the method of treatment of landfill gas. d) Classify the solid waste usually generated in a municipality.	2 + 4 + 4 + 5

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M. TECH. ENVIRONMENTAL BIOTECHNOLOGY 1<sup>ST</sup> YEAR 2<sup>ND</sup> SEMESTER EXAM -2018**Subject: SOLID AND HAZARDOUS WASTE MANAGEMENT****Part-II****( 40 MARKS )**

No.	Questions	Marks
1.	What is landfill gas? Explain various phases of landfill gas formation.	(1+3)
2.	Explain: <ul style="list-style-type: none"> <li>i. Types of homoacetogens and methanogens</li> <li>ii. Difference between methanogens and methanotrophs</li> </ul>	(2+2)
3.	What are the major compositions of landfill leachate and what are the specific bonds that are targeted to break down these biomolecules?	(2+1)
4.	Differentiate the microorganisms responsible for biogas formation depending on their oxygen requirements.	(3)
5.	Explain with diagram how would you detect the predominating microbial diversity at a landfill system using molecular methods: a) RAPD b) RFLP	(4)
6.	Why a DNA ladder is not required in DGGE analysis? How the method differs from normal agarose gel electrophoresis?	(1+3)
7.	What are the two different bio-degradation mechanisms for polyethylenes?	(2)
8.	Explain briefly degradation mechanisms and microorganisms responsible for the following: <ul style="list-style-type: none"> <li>a) Nylon</li> <li>b) Plastics (PU, PVA and PLA)</li> </ul>	(2+6)
9.	Explain the major compositions of MSW under specific heads.	(2)
10.	How do you screen metabolically potent bacteria for a particular metabolic character using molecular methods?	(3)
11.	What are the parameters that are responsible for better usage of a xenobiotic as a substrate for microbial degradation?	(3)