

Paper Code: ENV-32E

Roll No.

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**M.TECH**  
**THIRD SEMESTER EXAMINATION, 2016-2017**  
**HAZARDOUS WASTE MANAGEMENT**

[Time: 3 Hours]

[Max Marks: 100]

**Note:** Attempt all five questions. All questions carry equal marks.

1. Attempt any *two* parts of the following: - (10x2=20)

- (a) Describe in detail hazardous waste management along with cradle to grave concept.
- (b) Explain the land disposal methods of hazardous waste and its disadvantages
- (c) Define hazardous waste. Describe various sources of hazardous wastes.

2. Attempt any *two* parts of the following: - (10x2=20)

- (a) What are the physical methods of hazardous waste treatment? Discuss any four of them in detail.
- (b) Discuss the requirement for treatment, storage disposal and facilities of hazardous waste.
- (c) Discuss in detail the characteristics of hazardous waste.

3. Attempt any *two* parts of the following: - (10x2=20)

- (a) Describe the chemical methods of hazardous waste treatment. Discuss the treatment of hazardous waste in petrochemical industry.
- (b) Explain the stabilization and solidification process of hazardous waste? Discuss hazardous waste treatment process in electro wining operations.
- (c) Discuss the classification of hazardous waste? Explain the three categories of listed hazardous waste.

4. Attempt any *two* parts of the following: - (10x2=20)

- (a) Describe the term radioactivity. Why is it considered hazardous? What are the various health effects of radioactivity as per RCRA?
- (b) Write the short notes on transportation of hazardous waste. Explain how the disposal of hazardous waste is a problem?
- (c) Discuss the elements of an identification of hazardous waste treatment. Discuss deep well injection as a means of safe management of hazardous waste.

5. Write short notes on any *four* of the following: - (5x4=20)

- (a) Value extraction from hazardous waste
- (b) Waste stabilization ponds
- (c) Risk assessment of hazardous waste
- (d) Thermal gasification of hazardous waste
- (e) Landfarming
- (f) Thumb rule in hazardous waste documentation