

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
MID-SEMESTER EXAMINATION (March- 2015)
B.Tech ((VIII Sem.) / M. Tech. (II- SEM.)

COURSE CODE: 14M31CE216

MAX. MARKS: 30

COURSE NAME: Hazardous Waste Management

COURSE CREDIT: 3

MAX. TIME: 2 HRS

Note: Attempt all Questions. Assume suitable data if required.

Section A – (6 x 1 = 6 Marks)

1. Answer the following:
 - a) How Hazardous waste is different from other wastes.
 - b) What do you mean by “CCP”
 - c) What are “Superfund” sites? What are the steps involved in rehabilitation of superfund sites
 - d) How do you define a “Household Hazardous Waste”? Give examples
 - e) Write some of the salient features of RCRA
 - f) Write a note on “Basel Convention”

Section B – (3 x 3 = 9 Marks)

2. With the help of a neat diagram, explain the critical path technique for determining if a waste is hazardous under RCRA [03 Marks]
3. According to Hazardous and Solid Waste (HSWA) amendments of 1984, what are the minimum technology requirements for land disposal facilities? [03 Marks]
4. Differentiate between “Volatile”, “Semivolatile” and “Nonvolatile” organics based on their physical - chemical properties and give examples for each. What technique is used for their detection? [03 Marks]

Section C – (3 x 5 = 15 Marks)

5. a) What are “Listed” and “D-Listed” hazardous wastes? What are the limitations of this classification system? [2.5 Marks]
 b) How engineering classification system of hazardous wastes is different from regulatory classification system. Give examples [2.5 Marks]
6. a) Discuss briefly about the hazardous waste generation scenario in India [2.5 Marks]
 b) What are “TSDFs”. Write a note on the TSD facilities in India. [2.5 Marks]
7. a) What do you mean by Mass Balance? What are the steps involved in conducting a mass balance for a system? [2.5 Marks]
8. b) 50,000 L/day of groundwater contaminated with 10000mg/L of benzene and 5,000mg/L of trichloroethylene (TCE) are fed to a system where air is being injected at a rate of 100,000L/day. The influent air has no organic contaminants and does not react inside the system (i.e., no air dissolves in the water and no water is picked up by the air). The process takes place at 25°C, the same temperature of the influent groundwater and air. The benzene concentration in the effluent groundwater is 1000mg/L and the removal efficiency of TCE is 50 percent of the removal efficiency of benzene. Assume that the flow of groundwater and air does not change as a result of the process, and calculate the mass of benzene and TCE in the effluent air and groundwater streams. [2.5 Marks]