

(A-9CA) Seat No: \_\_\_\_\_

SARDAR PATEL UNIVERSITY

M. Sc. -Integrated Biotechnology – Ninth Semester Examination

Wednesday, 19<sup>th</sup> October 2016

Time: 10:00 am to 01:00 pm

PS09CIGEB2: Waste Management

Total Marks – 70

- Q.1 Mark the right answer of following questions. [08]**
- What is the most valuable recycled component of a circuit board?  
a. Copper      b. Silver      c. Gold      d. Platinum      e. Zirconium      f. Nickel
  - What is the color coding used in hospital to dispose of discarded medicine?  
a. Yellow      b. Black      c. Red      d. Blue      e. White      f. Green
  - Which of the following is not a source reduction activity?  
a. Products package reuse      c. Saving energy using recycled material  
b. Raw material reduction by modifying practices      d. Change in package design that reduce material toxicity
  - Which of the following is the most stable, economical reliable & environmental safe disposal technique for radioactive wastes?  
a. Ocean dumping      b. Geological dumping      c. Sub-seabed disposal      d. Sub-ductive disposal
  - Basal convection on trans-boundary movement of hazardous waste was implemented in the year of \_\_\_\_\_.  
a. 1969      b. 1979      c. 1989      d. 1999      e. 2009
  - Which one of the following is the category six (VI) of biomedical waste in India?  
a. Waste Sharpe      c. Plaster casts  
b. Discarded Medicine      d. Contaminated cotton & dressings
  - Typical modern municipal landfill contains which of the following?  
a. Monitoring wells      b. CH<sub>4</sub> retrieval system      c. Impermeable barriers      d. b & c      f. All of these
  - From the following, which of the material is the least to get recycled?  
a. Old synthetic carpet      c. Copper wire  
b. Glossy Paper      d. Corrugated cardboard

- Q.2 Answer the following questions. (ANY SEVEN OUT OF NINE) [14]**
- Define hazardous waste. Write the types of hazardous wastes.
  - What are the advantages and disadvantages of incineration processes for waste management?
  - Why analysis and quantification of solid wastes are essential?
  - Explain chemical oxidation and reduction treatment processes for hazardous waste management.
  - Describe examples and advantages of syngases.
  - How to waste minimization? Explain it with giving appropriate examples.
  - Write advantages and disadvantages of on-site and off-site treatment of biomedical wastes.
  - Discuss categories of radioactive wastes.
  - Define E-waste. Which factors determine the efficiency of E-waste collection systems?

(P.T.O.)

- Q.3 A. What are the fundamental approaches of solidification processes for HW? Discuss process, advantages and disadvantages of any three disposal techniques of hazardous wastes. [06]  
B. Define RCRA. Outline the physical treatment processes used for HW management. [06]

OR

- B. Which legislative aspects are significant for hazardous waste management? Discuss the guidelines of transportation for hazardous wastes. [06]

- Q.4 A. Enlist stages involved in designing a MRF system. Give a detailed account on material recovery facilities for municipal waste management. [06]  
B. Write short notes on: 1. Refused derived fuel [06]  
2. Inverted hierarchy of MSW management options with justification

OR

- B. Summarize the types, collection and transportation of municipal waste management. [06]

- Q.5 A. What are the advantages of waste minimization? Write a detailed note on segregation and collection of biomedical wastes. [06]  
B. Write short notes on: 1. Categories of BMW 2. Land filling [06]

OR

- B. Write classification of BMW based on nature of waste. Describe biomedical waste disposal techniques. [06]

- Q.6 A. Write categories of E-waste based on recycled potential. Summarize E-waste management processes. [06]  
B. What are the human health effects of radioactive wastes? Describe treatment and disposal methods of radioactive wastes. [06]

OR

- B. What are the sources of metals in wastes? Outline various metal recovery processes from waste materials. [06]