

(23)

**SARDAR PATEL UNIVERSITY**  
**M. Sc. -Integrated Biotechnology – Ninth Semester Examination**  
**Friday, 22<sup>nd</sup> March 2019**  
**Time: 10:00 am to 01:00 pm**  
**PS09CIGEB2: Waste Management**

- Total Marks – 70**
- Q.1 Mark the right answer of following questions. [08]**
1. The simplest and most common method used in the cities is to collect and dump the waste in a \_\_\_\_\_.  
 a. Landfill                      b. River                      c. Ocean                      d. Space                      e. All of these
  2. Man-made radiations include: \_\_\_\_\_.  
 a. Nuclear weapon                      b. Nuclear power plant                      c. X-rays                      d. All of these
  3. What are hazardous traits?  
 a. Ignitable      b. Corrosive      c. Reactive      d. Toxic      e. a & b both      f. All of these
  4. Which method is used if suitable dumping areas are not available?  
 a. Composting      b. Incineration      c. Pulverization      d. Dumping in to the sea
  5. What is the least preferable option?  
 a. Reuse      b. Recycle      c. Treatment      d. Waste to energy      e. Disposal
  6. Feature(s) of zero waste management is (are): \_\_\_\_\_.  
 a. Separation of garbage of source                      c. Separate collection of each kind wastes  
 b. Involvement of community in all activities      d. All of these
  7. Deep-well injection is most likely to pollute \_\_\_\_\_ if the hazardous waste escapes from storage.  
 a. Food                      b. Oceans                      c. Ground water                      d. Air                      e. Land
  8. Under which rule of government guidelines for solid waste management are followed today?  
 a. MSW Rules, 2000                      c. Solid waste Rules, 2000  
 b. MSW Rules, 201                      d. Solid waste Rules, 2016

- Q.2 Answer the following questions. (ANY SEVEN OUT OF NINE) [14]**
1. What are the advantages of waste minimization and size reduction?
  2. What are the advantages of color-coded waste containers used for BMW?
  3. Enlist physical treatment processes generally used for hazardous waste management.
  4. Which different types of pollutants are present in bio-medical wastes?
  5. Enlist the types of E-wastes.
  6. Which different materials/components present in MSW?
  7. Write advantages of syngases.
  8. Write advantages of reuse and recycling of waste components.
  9. Enlist disposal facilities used for radioactive waste.

- Q.3 A. Illustrate the role of each component used in material recovery facilities of MSW. [06]  
B. Write short notes on: 1. Refuse Derived Fuel. [06]  
2. Categories of solid wastes.
- OR
- B. Explain physical and chemical properties of municipal solid wastes. [06]
- Q.4 A. Describe guidelines for transportation of hazardous wastes and write risk assessment of hazardous wastes. [06]  
B. Write a note on solidification and stabilization technologies used to treat hazardous wastes. [06]
- OR
- B. Discuss various characteristics of hazardous wastes and enlist types of hazardous wastes. [06]
- Q.5 A. Briefly explain E-waste recycling and treatment of E-waste. [06]  
B. Write short notes on: 1. Effects of E-wastes on environment and human health. [06]  
2. Types radioactive wastes.
- OR
- B. Give an account on treatment of radioactive waste. [06]
- Q.6 A. Write rules of BMW segregation. Write a note on segregation, collection, labelling and storage of bio-medical wastes. [06]  
B. Give a short note on on-site and off-site treatment of BMW with its advantages and disadvantages. [06]
- OR
- B. Outline the process of sanitary landfilling. [06]

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