



22605

12223

3 Hours / 70 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answers with neat sketches wherever necessary.
 - (4) Figures to the right indicate full marks.

Marks

1. **Attempt any FIVE of the following :**

2 × 5 = 10

- (a) List two impacts of solid waste on environment.
- (b) State the importance of moisture content in managing solid waste.
- (c) State sources of Biomedical waste.
- (d) State the methods for storage of household waste.
- (e) Define Extended Producer Responsibility (EPR).
- (f) Define Transfer Station.
- (g) Define Pyrolysis.

2. **Attempt any THREE of the following :**

4 × 3 = 12

- (a) Explain the following types of wastes with an example of each :
 - (i) Agricultural waste
 - (ii) Market waste
 - (iii) C and D waste
 - (iv) Domestic waste



- (b) Explain the organization pattern of solid waste management.
- (c) Draw a neat labelled sketch of single composite liner system and label all the components.
- (d) With the help of a neat labelled sketch explain the working of a Bio-gas plant.

3. Attempt any THREE of the following :

4 × 3 = 12

- (a) Demonstrate the benefits of recycling of municipal solid waste with an example.
- (b) Compare Indore and Bangalore methods of composting on the following points :
 - (i) Type of composting process
 - (ii) Duration
 - (iii) Fly nuisance
 - (iv) Moisture control
- (c) State the importance of public participation in solid waste management.
- (d) Discuss segregation of Bio-medical waste as per BMW Rules – 2016.

4. Attempt any THREE of the following :

4 × 3 = 12

- (a) Explain the problems associated with handling and processing of solid waste.
- (b) Discuss the origin and effects of the following E-Waste constituents on human health :
 - (i) Cadmium
 - (ii) Lead
 - (iii) Mercury
 - (iv) Hexavalent chromium
- (c) Explain the salient features of Plastic Waste Management Rules – 2016.
- (d) State methods for recycling the following Industrial Wastes :
 - (i) Fly Ash
 - (ii) Blast Furnace Slag
 - (iii) Lime sludge
 - (iv) Phosphogypsum
- (e) Discuss duties of waste generators.

5. Attempt any TWO of the following :**6 × 2 = 12**

- (a) Discuss the importance of rag pickers in solid waste management.
- (b) Analyse the treatment and disposal options for all categories of Bio-medical wastes.
- (c) With the help of neat sketches describe the following methods of collection of municipal solid waste :
 - (i) Curb service
 - (ii) Alley service
 - (iii) Backyard service

6. Attempt any TWO of the following :**6 × 2 = 12**

- (a) Describe the various landfilling methods.
 - (b) Discuss methods of recycling the following E-waste materials :
 - (i) Glass
 - (ii) Lead
 - (iii) Plastic
 - (iv) PCBs
 - (v) Batteries
 - (vi) Mercury
 - (c) Discuss various control measures of industrial solid waste.
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