

17605

21415

3 Hours / 100 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.
(5) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

- 1. a) Attempt any SIX of the following:** **12**
- (i) State physical characteristics of solid waste. Explain any one.
 - (ii) Explain solid waste management hierarchy.
 - (iii) State factors affecting selection of site for transfer station.
 - (iv) State organizational setup of Solid Waste Management (SWM) administration for city having population between 5-10 lacs.
 - (v) Define biomedical waste. State components of Biomedical Waste (BMW).
 - (vi) Enlist sources of Biomedical waste.
 - (vii) Define communicable and non-communicable diseases.
 - (viii) Explain sorting at source and (MSW) Municipal Solid Waste.

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- b) **Attempt any TWO of the following:** **8**
- (i) State factors affecting generation of MSW.
 - (ii) Define transfer station. State necessity of transfer station.
 - (iii) State biomedical waste rules having six schedules and their content.
- 2. Attempt any FOUR of the following:** **16**
- a) State factors affecting composting process. Explain any one factor.
 - b) State factors affecting selection of site for land filling of Solid Waste.
 - c) Explain use and byproduct of incineration method of (SW) Solid Waste.
 - d) Explain methods of collection and segregation of biomedical waste.
 - e) Discuss importance of public involvement and participation in SWM.
 - f) State steps in recycling of Solid Waste. Explain one method.
- 3. Attempt any TWO of the following:** **16**
- a) Explain principles of composting of Solid Waste. Differentiate between Indore and Bangalore method with sketch.
 - b) What do you mean by Leachate? State effects of leachate and control measures.
 - c) Describe pyrolysis method of incineration w.r.t. meaning, principle, merits and demerits.

- 4. Attempt any TWO of the following:** **16**
- a) Classify in tabular form biomedical waste treatment w.r.t. option, category, treatment and disposal.
 - b) Explain effects of e-waste on human health and environment.
 - c) Explain waste minimisation approach for treating industrial solid waste.
- 5. Attempt any FOUR of the following:** **16**
- a) State sources of solid waste and types of solid waste.
 - b) Explain four characteristics of hazardous waste.
 - c) Explain issues regarding transportation of Solid Waste (SW).
 - d) Enlist tools and equipments for collection and transportation of solid waste.
 - e) As a Civil Engineer how will you promote four R (4R) principle of SWM.
 - f) Explain resource recovery through solid waste processing.
- 6. Attempt any FOUR of the following:** **16**
- a) Explain proximate analysis of Solid Waste.
 - b) Describe impact of Solid Waste on human health and environment.
 - c) Explain present scenario of collection of MSW.
 - d) Explain storage methods of Garden waste and construction demolition waste.
 - e) State role of mass education in SWM.
 - f) Describe present status of recycling of solid waste in India.
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