

314311

24225

3 Hours / 70 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Illustrate your answers with neat sketches wherever necessary.
 - (3) Figures to the right indicate full marks.
 - (4) Assume suitable data, if necessary.
 - (5) Use of Non-programmable Electronic Pocket Calculator is permissible.

Marks

1. Attempt any FIVE of the following :

5 × 2 = 10

- (a) List sources of air pollution.
- (b) Define BOD.
- (c) Give steps of industrial solid waste management.
- (d) Define hazardous waste.
- (e) Enlist authorities involved in pollution control.
- (f) Define smog.
- (g) Give disposal methods of solid waste management.

2. Attempt any THREE of the following :

3 × 4 = 12

- (a) Explain froth flotation process in waste water treatment with neat diagram.
- (b) Describe sanitary landfill solid disposal method.
- (c) Explain the process of chemical precipitation in hazardous waste treatment.
- (d) Describe factors responsible for hazardous waste prevention and minimization.



- 3. Attempt any THREE of the following :** **3 × 4 = 12**
- (a) Describe working of an electrostatic precipitator to remove particulate pollutants from exhaust gases with neat diagram.
 - (b) Describe working of trickling filter used in waste water treatment with neat diagram.
 - (c) Explain pyrolysis process in the thermal treatment of hazardous waste.
 - (d) Explain salient features of Hazardous Waste Management Rule, 2016.
- 4. Attempt any THREE of the following :** **3 × 4 = 12**
- (a) Explain cyclone separator for removing particulate matter from industrial gases with neat diagram.
 - (b) Describe Reverse Osmosis (RO) used in waste water treatment.
 - (c) Explain the health consequences of poor industrial waste disposal.
 - (d) Describe chemical oxidation and reduction processes (redox) work to neutralize harmful substances in hazardous waste.
 - (e) Explain objective of the Water (Prevention and Control of Pollution) Amendment Bill, 2024.
- 5. Attempt any TWO of the following :** **2 × 6 = 12**
- (a) Describe any two characteristics of chemical industrial waste water and state sources of waste water in chemical industry.
 - (b) A waste water sample is diluted by a factor of 20. The initial Dissolved Oxygen (DO) of the diluted sample is 8.0 mg/L. After 5 days of incubation at 20°C, the final DO of the diluted sample is 2.0 mg/L. Calculate the BOD of the undiluted waste water sample.
 - (c) Describe the safety measures to follow during the transfer and transport of hazardous waste.
- 6. Attempt any TWO of the following :** **2 × 6 = 12**
- (a) Explain environmental and health impacts of open burning of industrial solid waste.
 - (b) Describe methods which are commonly used to control particulate matter emissions in cement plants. Describe any one.
 - (c) Explain role of Central Pollution Control Board (CPCB) and State Pollution Control Board (SPCB).
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