

**PLASTIC WASTE RECYCLE AND MANAGEMENT
(CHE3122)**

Time Allotted : 2½ hrs

Full Marks : 60

Figures out of the right margin indicate full marks.

*Candidates are required to answer Group A and
any 4 (four) from Group B to E, taking one from each group.*

Candidates are required to give answer in their own words as far as practicable.

Group – A

1. Answer any twelve:

12 × 1 = 12

Choose the correct alternative for the following

- (i) Which recycling process involves breaking plastics into smaller pieces and reprocessing them into new products?
(a) Mechanical recycling (b) Chemical recycling
(c) Biological recycling (d) Incineration
- (ii) Which of the following is a thermoset plastic that is difficult to recycle?
(a) PVC (b) PET (c) Bakelite (d) HDPE
- (iii) In chemical recycling, plastics are converted into:
(a) Fibers (b) Monomers or fuels
(c) Paper (d) Compost
- (iv) Which type of plastics can naturally degrade in the environment?
(a) Non-degradable (b) Biodegradable
(c) Thermosets (d) Polyolefins
- (v) Bioplastics are generally derived from:
(a) Fossil fuels (b) Agricultural resources
(c) Metals (d) Ceramics
- (vi) Microplastics are defined as plastic particles smaller than:
(a) 5 cm (b) 5 mm (c) 5 µm (d) 5 nm
- (vii) Which process produces liquid fuels from plastic waste?
(a) Gasification (b) Pyrolysis
(c) Composting (d) Shredding
- (viii) Segregation of plastic waste is most effective at:
(a) Landfill site (b) Source
(c) Recycling plant (d) Incineration site
- (ix) Which year did India first notify Plastic Waste Management Rules?
(a) 2000 (b) 2011 (c) 2016 (d) 2022

- (x) Toxicity of plastic waste is mainly due to:
 (a) Heavy metals (b) Additives and microplastics
 (c) Excessive water content (d) Natural degradation

Fill in the blanks with the correct word

- (xi) _____ recycling code corresponds to Polyethylene Terephthalate (PET).
 (xii) _____ is a thermoset plastic that is difficult to recycle.
 (xiii) Bioplastics are generally derived from _____.
 (xiv) In India, plastic waste generation is highest in _____.
 (xv) Segregation of plastic waste is most effective at _____.

Group - B

2. (a) Define plastics and classify them into thermoplastics and thermosets with two examples each. [[CO1](Analyse/HOCQ)]
 (b) Explain the concepts of reduce, reuse, and recycle in plastic waste management. [[CO1](Remember/LOCQ)]
6 + 6 = 12
3. (a) Explain recycling of LDPE films. [[CO1](Analyse/HOCQ)]
 (b) Describe difficulties in recycling polystyrene. [[CO1](Remember/LOCQ)]
6 + 6 = 12

Group - C

4. (a) Explain crushing and separation techniques in primary recycling. [[CO2](Apply/IOCQ)]
 (b) Write short notes on PET film recycling. [[CO2](Apply/IOCQ)]
6 + 6 = 12
5. (a) Explain hydrolytic treatment of plastic wastes containing paper. [[CO2](Analyse/IOCQ)]
 (b) Describe processing methods for mixed plastic household waste. [[CO2](Remember/LOCQ)]
6 + 6 = 12

Group - D

6. (a) Explain the global scenario of plastic waste generation with statistics. [[CO3](Evaluate/HOCQ)]
 (b) Discuss the Indian scenario of plastic waste generation. [[CO3](Remember/LOCQ)]
6 + 6 = 12
7. (a) Discuss various plastic waste collection methods. [[CO3](Apply/IOCQ)]
 (b) Explain the role of informal waste pickers in India. [[CO3](Remember/LOCQ)]
8 + 4 = 12

Group - E

8. (a) Define Extended Producer Responsibility (EPR) and its objectives. *[[CO4)(Analyse/HOCQ)]*
(b) Explain its significance for plastic packaging waste. *[[CO4)(Remember/LOCQ)]*
6 + 6 = 12
9. (a) Discuss challenges in Municipal Solid Waste (MSW) handling. *[[CO4)(Remember/LOCQ)]*
(b) Explain toxicity issues associated with plastic waste. *[[CO4)(Remember/IOCQ)]*
6 + 6 = 12
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Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	43.75	31.25	25

