12425

3 Hours / 70 Marks Seat No. | | | | | | | | |

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) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following : **10**

(a) State 4R terminology of polymer waste management.

(b) Draw a neat sketch of float and sink method.

(c) State the recycling codes for following polymers :

(i) PP

(ii) PVC

(iii) HDPE

(iv) PS

(d) Enlist four applications of recycled PET.

(e) State any four application of ABS in automobile field.

(f) State the importance of environmental studies.

(g) Enlist the problems associated with water resources.

2. Attempt any THREE of the following : **12**

(a) Enlist various types of pollution and state two ways to control the each pollution.

(b) Explain various collection methods of waste polymers.

(c) State four properties and applications of recycled PS.

(d) State the importance of energy resources with the need of growing energy demand.

3. Attempt any THREE of the following : **12**

(a) Explain four hazards to environment due to accumulation of Polymer Waste.

(b) State and explain various methods of landfilling in brief.

(c) Differentiate secondary recycling and Quaternary recycling.

(d) Explain the structure of Ecosystem.

4. Attempt any THREE of the following : **12**

(a) State various four sources of polymer waste with their example.

(b) Explain the mechanism of biodegradation with the examples of enzymes used.

(c) Describe zigzag separator with the help of neat sketch.

(d) State the need of size reduction and basic difference in cutting, shredding and fine grinding in recycling polymers.

(e) Explain In-situ and Ex-situ conservation of biodiversity.

5. Attempt any TWO of the following : **12**

(a) State and explain various steps in polymer waste management in brief.

(b) Explain pyrolysis in detail with neat sketch (labelled), byproduct; working principle.

(c) State the applications of recycled polymer :

(i) HDPE

(ii) PVC

(iii) LDPE

6. Attempt any TWO of the following : **12**

(a) State the various additives with their function to improve the properties of recycled polymers.

(b) Illustrate the following processes of recycling :

(i) Hydrolysis

(ii) Methanolysis

(c) Justify following statement with reason :

(i) R-HDPE used in manufacturing films.

(ii) R-PU used to manufacture foam

(iii) R-mixed polymers in injection moulded product manufacturing.
