17652

16117

3 Hours / 100 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) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

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

(7) Abbreviations used convey usual meaning.

Marks

1. a) **Answer any <u>THREE</u> of the following:** **12**

(i) Explain with a diagram the filament winding process of composites.

(ii) How is miscibility of polymer blends determined?

(iii) Differentiate polymer alloys and polymer blends (minimum four points of differentiation)

(iv) State any four properties and four applications of PE based polyblends.

b) **Answer any <u>ONE</u> of the following:** **6**

(i) Compare thermosetting and thermoplastic resin system involved in composites.

(ii) Explain with a labelled diagram the sandwich structure composite.

Marks

2. Answer any FOUR of the following: **16**

a) State the fundamentals of composites.

b) Explain with a diagram the direct melt glass fibre manufacturing process.

c) Explain pressure bag moulding process for composites.

d) How is impact modification done by elastomers in polymer blends? Name such elastomers.

e) Explain the process of development of commercial blend.

f) Explain the preparation of PPO based blends. Write its two applications.

3. Answer any FOUR of the following: **16**

a) List types of thermoplastic resins used in composites. Write properties and applications of any two of them.

b) Explain the role of accelerators in moulding operation. Name any two accelerators.

c) Write any four applications of hybrid composite.

d) List any four common faults observed in FRP.

e) State the factors on which economy of blending depends.

f) Write any four advantages and disadvantages of epoxies over polyester resins.

4. a) Answer any THREE of the following: **12**

(i) What are the different elements of composites? State their role.

(ii) Draw a labelled figure of manufacturing of carbon fibre.

(iii) Explain with a diagram the pultrusion process of composites.

(iv) Explain the classification of polymer blends.

b) Answer any ONE of the following: **6**

(i) Explain with a labelled diagram the SMC sheet.

(ii) 1) Explain the preparation of aramide fibre.

2) State its two properties and two applications.

Marks

5. Answer any FOUR of the following: **16**

a) List any two coupling agents. State their role in compounding.

b) Write any four properties and four applications of carbon fibre.

c) Describe with a laballed diagram the RTM process.

d) Explain the role of compatibilisers in polymer blends. Name two compatibilisers in use.

e) Explain as to how the blend performance is determined on the basis of mechanical properties.

f) List any four properties and four applications of PS based polyblends.

6. Answer any FOUR of the following: **16**

a) What is vinyl ester? How does it differ from conventional unsaturated polyester?

b) Write any four properties and four applications of BMC.

c) Explain the manufacturing process of honeycomb structure composite.

d) Define polymer blend. Explain its need.

e) Explain the need of compatibility in polymer blends.

f) Explain different types of reinforcement orientations.
