17652

11819

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) Use of Non-programmable Electronic Pocket Calculator is permissible.

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

(8) Use of Steam tables, logarithmic, Mollier's chart is permitted.

(9) Abbreviations used, convey usual meaning.

Marks

1. Attempt any TEN of the following: **20**

a) Write down the fundamentals of composites.

b) What is the role of matrix in a composite?

c) Write down any four applications of SMC.

d) Give an example and role of coupling agent in composites.

e) Define surfacing tissue.

f) Name the different core materials used in sandwich composites.

g) Write down any four properties of aramid fibre.

Marks

h) Name any four product manufactured by filament winding.

i) Write down disadvantages of pressure bag moulding.

j) Write down causes and remedies for elephant skin problem in a composite.

k) Define miscibility.

l) Give the classification of 'Blend'.

m) Write down any four applications of PS/PPO blend.

n) State whether PVC/NBR blend is miscible or not. Why?

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

a) Explain thermoplastic composites.

b) Explain polyester as a matrix material in composites.

c) Describe manufacturing of hybrid composites.

d) What are compatibilisers? Explain their role by giving suitable examples.

e) How will you improve the impact property of polymeric material by elastomer? Explain it by giving suitable examples.

f) Explain the need of compatibility.

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

a) Explain vinyl ester resin system.

b) Write down the important four applications of sandwich composites.

c) Compare polymer blend with alloy by giving four points each.

d) Explain the method for the determination of mechanical performance of a blend.

e) Explain preparation and applications of PP/EPDM blend.

f) Write down the important properties of PVC/NBR blend.

Marks

4. Attempt any FOUR of the following: **16**

a) Explain PP or PVC material as matrix in thermoplastic composites.

b) (i) List down the curing agents and accelerators for epoxy resin system.

(ii) What do you mean by sizing of the fibre.

c) (i) Write down any four advantages of spray lay up technique.

(ii) Write down the Gibb's free energy equation.

d) Explain with a diagram, process of matched die moulding.

e) Write down the causes and remedies for two following faults-

(i) pin hole

(ii) warpage

(iii) delamination

f) Explain the different criterion for determination of miscibility in a polymer blend.

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

a) Describe preparation of a bulk moulding compound.

b) Give an example and explain role of release agent and flame retardant in composites.

c) Write down the preparation and applications of graphite fibre.

d) Explain various natural fibres in the composites.

e) Explain different core materials used in sandwich composites.

f) Explain as to how you will develop a commercial blend.

Marks

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

a) Explain properties and applications of prepregs.

b) Explain any two forms of glass fibre.

c) Explain the effect of orientation of fibre on the performance and properties of composites.

d) Explain pultrusion process for composite profile with a diagram.

e) (i) Explain meaning of a 'phase diagram'.

(ii) List down the examples of polymer alloys.

f) Explain method to prepare electrically conductive blend. Describe the method for determination of performance of electrically conductive blend.