

**Scheme – I**  
**Sample Question Paper**

**Program Name** : Diploma in Plastic Engineering  
**Program Code** : PS  
**Semester** : Third  
**Course Title** : Polymer Composites  
**Marks** : 70

**22352**

**Time: 3 Hrs.**

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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) Preferably, write the answers in sequential order.

**Q.1) Attempt any FIVE of the following.** **10 Marks**

- a) With suitable example define composites.
- b) State any two important properties of polycarbonate as a polymer matrix.
- c) State any two important properties of boron fibre.
- d) Draw a neat labeled diagram of pultrusion machine.
- e) Define resin transfer moulding.
- f) State any four important industrial applications of composites in aerospace.
- g) State any four important applications of bio-composites.

**Q.2) Attempt any THREE of the following.** **12 Marks**

- a) State any two examples of following:
  - i) Release agents, ii) Inhibitors.
- b) Describe the preparation of phenolics with a suitable reaction.
- c) Describe the manufacture of carbon fibre with a suitable sketch.
- d) State any four important applications of composites in telecommunication.

**Q.3) Attempt any THREE of the following.** **12 Marks**

- a) Give the classification of composites and state any two merits of composites.
- b) Select the curing agent for the manufacture of boat hull with unsaturated polyester.  
Justify your answer.
- c) Describe the curing reaction of thermosetting resin.
- d) Describe the manufacture of graphite fibre with suitable sketch.

**Q.4) Attempt any THREE of the following.** **12 Marks**

- a) Select the suitable accelerator and the method of manufacture of fuel storage tank with the help of epoxy resin. Justify your answer with sketch.

- b) State the long form of SMC. Explain the process involved in the production of SMC with a labeled sketch.
- c) Select the material and process for manufacture of a moulding compound having a dough like consistency with labeled sketch and justification.
- d) State the name of the processes involved in the production of honeycomb material. Which is the most common method for the production of honeycomb material. Explain this process with a labeled sketch.
- e) Explain with labeled sketch the process involved in the construction of composites which uses the materials like face sheet, adhesive, honeycomb etc.

**Q.5) Attempt any TWO of the following.**

**12 Marks**

- a) Explain the process of vacuum bag and pressure bag moulding with a labeled sketch.
- b) Explain the process for the production of a water storage tank with 20 litre capacity with a labeled diagram. Also select a method for the manufacture of aircraft flooring and justify.
- c) Describe six most significant composite properties in rocket and missile uses.

**Q.6) Attempt any TWO of the following.**

**12 Marks**

- a) Describe the manufacturing method used for manufacturing corrugated construction panels with a labeled sketch. State three advantages of the use of composites in truck combined cab and sleeper units.
- b) Describe advantages of aramid versus carbon fibres in the use of aircraft wing leading edge.
- c) Select the method for the production of bus shelters. Explain this method with a labeled sketch. Also explain the method for the manufacture of dish-shaped object with one side smooth with a labeled sketch.

**Scheme – I**  
**Sample Test Paper - I**

**Program Name** : Diploma in Plastic Engineering  
**Program Code** : PS  
**Semester** : Third  
**Course Title** : Polymer Composites  
**Marks** : 20

22352

**Time: 1 Hour**

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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) Preferably, write the answers in sequential order.

**Q.1 Attempt any FOUR.**

**08 Marks**

- a) Define composites and state the elements of composites.
- b) Classify the composites.
- c) Define curing agents and accelerators.
- d) State any two important properties of unsaturated polyester resin.
- e) State any four important applications of phenolics.
- f) State the full forms of SMC and BMC.

**Q.2 Attempt any THREE.**

**12 Marks**

- a) Define inhibitors, coupling agents,. State two functions of each.
- b) State any four merits of composites.
- c) Explain the method of preparation of epoxy resin with a suitable reaction.
- d) State any four important properties of polyimides and PP materials as the polymer composite matrix.
- e) Define prepreg. Explain the preparation of SMC with a labeled diagram.
- f) State any two important properties of vinyl esters and unsaturated polyesters.

**Scheme – I**  
**Sample Test Paper - II**

**Program Name** : Diploma in Plastic Engineering  
**Program Code** : PS  
**Semester** : Third  
**Course Title** : Polymer Composites  
**Marks** : 20

**22352**

**Time: 1 Hour**

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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) Preferably, write the answers in sequential order.

**Q.1 Attempt any FOUR.**

**08 Marks**

- a) State any two important properties of glass fibres.
- b) State any four types of reinforcements.
- c) Draw a neat labelled diagram of hand-lay up process for composites.
- d) Define compression moulding for composites.
- e) Define nanocomposites
- f) State any four applications of composites in sports.

**Q.2 Attempt any THREE.**

**12 Marks**

- a) State any four applications of composites in construction and automobiles.
- b) State any four applications of nanocomposites and biocomposites.
- c) State any two defects observed in composites manufacturing and state their causes and remedies.
- d) Describe the process of filament winding method for the production composites.
- e) Describe the manufacture of hybrid composites.
- f) Explain any four important properties of aramid fibres.