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.

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 properpties 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 fires 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

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

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.