[This question paper contains 3 printed pages.]

Your Roll No. .....

3177 **J**

M.E. Polymer Technology

Paper—CH.651

(MOULD AND DIE DESIGN)

Time : 3 *Hours* *Maximum Marks* : 100

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt any ***five*** *questions.*

All *questions carry equal marks.*

1. (a) How a lathe is specified ? Describe any three machining operations done on lathe. 10

   (b) What are the types of milling machines ? With the help of neat sketch, explain the principles of vertical milling machine. 5

   (c) Describe the operation of electro–discharge machining (EDM). What are its advantages and disadvantages ? 5

2. (a) Elaborate the role of CAD/CAE practices in the designing and manufacturing of plastic moulds. 10

   (b) Discuss the importance of feed systems in the moulding process. How runner layout is responsible for balancing of runners ? Discuss with the help of neat sketches. 10

3. (a) What do you understand by the term "Gate" ? Name and design two different types of gates used in the injection moulding. 10

(b) What are the main criteria used for the selection of ejection system in injection moulding ? With the help of suitable sketches, discuss Stripper Plate and Pin ejection systems. 10

4. (a) Define importance of ejector plate assembly return system and also discuss different types of mechanism used for the movement of ejector plate. 10

(b) Name the metals which are being used for making compression moulds. Draw labelled front view of semi-positive vertical flash and open flash type mould used for compression moulding in section. 10

5. (a) With the help of suitable sketch, discuss the design features of pot transfer mould. 10

(b) Explain the following with appropriate illustrative sketches : $5 \times 2 = 10$

(1) Melt Fracture.

(2) Extrudate Swell.

6. (a) What is the difference between sheet and film ? Name and sketch the different types of dies used in film and sheet extrusion. Briefly discuss, the mechanism used for flow adjustment in sheet and film dies. 10

(b) Discuss the features taken into consideration while designing a die and also describe the phenomenon of die forming with the help of velocity and temperature profiles. 10

7. Draw labelled neat sketch/diagram of *any four* of the following : $5 \times 4 = 20$

(1) Cooling system for large shallow cavity.

(2) Baffled cooling system.

(3) Schematic diagram of co-extrusion die.

(4) Schematic diagram of wire-coating die.

(5) Blow mould layout

8. Write short notes on *any four* of the following : $5 \times 4 = 20$

(i) Cylindrical Grinding Machine.

(ii) Electro-deposition process.

(iii) Caliberatores for rigid and semi-rigid tube.

(iv) Runner profiles and their efficiency.

(v) Ejector Grid.

(vi) Moulds for expandable polystyrene.