

CENTRAL INSTITUTE OF PETROCHEMICALS ENGINEERING & TECHNOLOGY
HEAD OFFICE : GUINDY, CHENNAI – 600 032.
ACADEMIC CELL
FIRST SEMESTER EXAMINATION – JANUARY - 2024

Duration : 3 Hours
Course : PD - PMD with CAD/CAM
Subject : Plastics Materials

Max. Marks: 60
Date : 09.01.2024
Time : 10.00 a.m. to 01.00 p.m.

(DO NOT CHANGE SEQUENCE OF QUESTION NUMBER IN ANSWER SCRIPT)

PART – A

Answer **all** questions

12 x 1 = 12

- 1 Shellac is produced from the secretion of an-----
(a) Plant (b) Insect (c) Tree (d) None of these
- 2 Which Plastic exhibits the highest density?
(a) PPS (b) PEI (c) PTFE (d) PEEK
- 3 Which Plastic is self-extinguishing?
(a) PE (b) PS (c) PSF (d) ABS
- 4 The melting point of phenol is _____
- 5 Theresin themselves contain no reactive methylol group and do not form cross-linked structure on heating
- 6 In PPO there is very less scope of crystallization is the part because of-----
- 7 Cellulose is thermo set plastics say True/False
- 8 MEKP is Catalyst for unsaturated Polyester resin curing say True/False
- 9 Urea formaldehyde is transparent material say True/False
- 10 Write the full form of UHMWHDPE
- 11 Write the full form of ISO
- 12 Write the full form of EPS

PART – B

Answer **all** questions (Max. 40 words)

4 x 2 = 8

- 1 What are monomers and polymers? Give suitable examples?
- 2 What do you mean by copolymer and give two examples?
- 3 Write down the addition polymerization and condensation polymerization?
- 4 Write name of monomers of the following polymers and classify them as addition or Condensation polymers-Teflon, Bakelite, Natural rubber ?

PART – C

Answer any **six** questions (Max. 100 words)

6 x 4 = 24

- 1 What is the Liquid Crystal Polymer and conductive Polymers.give example?
- 2 Write the advantage and disadvantage of Fluoropolymers?
- 3 What is the Pheno Formaldehyde and Urea Formaldehyde Resin,application and Properties?
- 4 Explain Polyurethane and Silicones write down Properties and application?
- 5 What are the major requirements to classification a polymer as engineering plastics?
- 6 Differentiate between amorphous and Crystalline material?
- 7 Explain the ABS Preparation with diagram and chemical reaction?

PART – D

Answer any **two** questions (Max. 300 words)

2 x 8 = 16

- 1 Define Blend and Alloys Properties, Limitation and application
- 2 Explain Crystalline and Amorphous polymers also their Properties?
- 3 Explain Thermal, Mechanical, Electrical, Chemical and Optical Properties of PC?

CENTRAL INSTITUTE OF PETROCHEMICALS ENGINEERING & TECHNOLOGY
HEAD OFFICE : GUINDY, CHENNAI – 600 032.
ACADEMIC CELL
FIRST SEMESTER EXAMINATION – JANUARY - 2024

Duration : 3 Hours
Course : PD – PMD with CAD/CAM
Subject : Plastics Product Design

Max. Marks: 60
Date : 10.01.2024
Time : 10.00 a.m. to 01.00 p.m.

(DO NOT CHANGE SEQUENCE OF QUESTION NUMBER IN ANSWER SCRIPT)

PART – A

Answer **all** questions

12 x 1 = 12

- The number of standard symbols recommended by ISO & BIS to control geometrical characteristics.
a) 11 b) 12 c) 13 d) 14
- Which one is the contraction in dimensions of the product after it is mould.
a) Defeat b) Shrinkage c) Taper d) Packing
- _____ is a moulding process whereby two or more plastic materials are moulded in one operation to make one moulded part injected into the same mold.
(a) Composite moulding (b) Thermo forming (c) Extrusion (d) None
- Straightness and flatness are _____ tolerances.
- Product will shrink more at _____ section.
- Ability of material to return its original position is called _____ .
- Rib design, the rib thickness should be less than the part nominal wall thickness. Say True or False
- Stress concentration in the product cannot be reduced by fillets- Say True or False.
- Most constituents of composite material is Fiber and Matrix. Say True or False.
- DFMA Stands for _____
- CAM stands for _____
- GD&T stands for _____

PART – B

Answer **all** questions (Max. 40 words)

4 x 2 = 8

- What is the role of aesthetics in product design?
- What is the purpose of radii and fillet.
- What is Datum.
- Why brass materials are most frequently used as inserts?

PART – C

Answer any **six** questions (Max. 100 words)

6 x 4 = 24

- What are all the essential requirements of good product design.
- What are the basic factors that affect the shrinkage of plastics.
- Explain about the significance of bosses with help of a neat sketch.
- Explain different types of threads used in plastic products with diagram?
- What are bolted and bonded joints.
- Define undercut and what are the types of undercut.
- How is composite material made.

PART – D

Answer any **two** questions (Max. 300 words)

2 x 8 = 16

- Explain the following plastics product design features specification with sketch.
a) Ribs b) Wall Thickness
- Define Hinges and explain various types of Hinges with neat sketch.
- Explain about any two types composites with the help of neat sketches.

CENTRAL INSTITUTE OF PETROCHEMICALS ENGINEERING & TECHNOLOGY
HEAD OFFICE : GUINDY, CHENNAI – 600 032.
ACADEMIC CELL
FIRST SEMESTER EXAMINATION – JANUARY - 2024

Duration : 3 Hours
Course : PD – PMD with CAD/CAM
Subject : Plastics Mould Design – I

Max. Marks: 60
Date : 11.01.2024
Time : 10.00 a.m. to 01.00 p.m.

(DO NOT CHANGE SEQUENCE OF QUESTION NUMBER IN ANSWER SCRIPT)

PART – A

Answer **all** questions

12 x 1 = 12

1. The internal shape of the molded product is formed by _____.
(a) Core (b) Cavity (c) Guide Pillar (d) Guide Bush
2. Material used for making core & cavity for long production is _____.
(a) Mild steel (b) P20 (c) Spring steel (d) Cast iron
3. The fit used for main mould guide pillar and bush is _____.
(a) H7/g6 (b) H7/h6 (c) H7/m6 (d) H7/f7
4. _____ gate is used to feed from the base in single impression two plate mold.
5. In sleeve ejection system, core insert pin is attached to _____ plate.
6. Clamping force = Injection pressure X _____.
7. Spherical radius of sprue bush is greater than spherical radius of nozzle – Say True or False.
8. Coolant annulus method is used to cool circular cavity inserts – Say True or False.
9. In air ejection, ejection force is provided by compressed air – Say True or False.
10. BOM stands for _____
11. HCHCR stands for _____
12. Abbreviation of DME _____

PART – B

Answer **all** questions (Max. 40 words)

4 x 2 = 8

1. What is the necessary of providing taper locator and taper location in the mould?
2. What is shrinkage? Write the shrinkage value of PP and ABS plastic materials.
3. What is the use of Sprue Puller?
4. What is cull?

PART – C

Answer any **six** questions (Max. 100 words)

6 x 4 = 24

1. What are the types of guide pillars and guide bush used in moulds? Explain with neat sketch.
2. Explain different types of sprue puller design with neat sketch.
3. Find the number of cavities required for mould? Assume Cycle Time = 60sec., Production required per month=90,000Nos., No.of working days per month =24days, No.of hours per day = 16hrs.
4. What are the different types of ejection? Explain Valve ejection with neat sketch.
5. What is standard Mould Base? Write the standard mould parts used in moulds.
6. What are the different types of compression mould? Explain Open flash type with neat sketch.
7. Write down the advantages & Disadvantages of Transfer mould.

PART – D

Answer any **two** questions (Max. 300 words)

2 x 8 = 16

1. Design and Draw the four cavity Injection mould with stripper plate ejection for Pharma 10ml PP measuring cap. Explain the function of each mould parts & raw materials to be used.
2. What are the types of compression moulds? Explain any two with neat sketch.
3. Write short design notes on the following
(a) "O" Ring (b) Bubbler Cooling (c) Bulk Factor (d) DFMA of Moulds

CENTRAL INSTITUTE OF PETROCHEMICALS ENGINEERING & TECHNOLOGY
HEAD OFFICE : GUINDY, CHENNAI – 600 032.
ACADEMIC CELL
FIRST SEMESTER EXAMINATION – JANUARY - 2024

Duration : 3 Hours
Course : PD – PMD with CAD/CAM
Subject : Plastics Processing Technology

Max. Marks: 60
Date : 12.01.2024
Time : 10.00 a.m. to 01.00 p.m.

(DO NOT CHANGE SEQUENCE OF QUESTION NUMBER IN ANSWER SCRIPT)

PART – A

Answer **all** questions

12 x 1 = 12

1. What are the variable factors in Injection moulding processes
a. Pressure b. Temperature, c. Speed d. all of these
2. The most economical process to form bottles from polyethylene material is
a. Injection moulding b. Vacuum forming c. Blow moulding d. Compression moulding
3. Breathing is done in which process
a. Compression moulding b. Injection moulding c. Extrusion d. Rotomoulding
4. Size of extruder is measured by _____
5. Which type of heater used in Compression moulding _____
6. Draw ratio of straight vacuum forming process is _____
7. In rotational moulding process material is used in the form of powder Say true or false
8. The function of torpedo is to increase Space to mass ratio Say true or false
9. Perfect neck finish is only obtained in Extrusion Blow moulding Say true or false
10. Expand RTM
11. Expand EBM
12. Expand RIM

PART – B

Answer **all** questions (Max. 40 words)

4 x 2 = 8

1. Why hopper throat cooling is necessary for barrel?
2. State the various moulds materials used in blow moulding.
3. Name the different extruder screws.
4. Enlist thermoforming techniques.

PART – C

Answer any **six** questions (Max. 100 words)

6 x 4 = 24

1. Draw the neat sketch of an injection-moulding machine and name its parts.
2. State the functions of screen pack and breaker plate.
3. Compare & contrast extrusion blow molding and injection blow molding
4. What are the advantages & disadvantages of rotational molding.
5. Explain the process of compression molding with the help of a neat diagram.
6. Explain RIM process.
7. Briefly explain plastics welding.

PART – D

Answer any **two** questions (Max. 300 words)

2 x 8 = 16

1. Compare and contrast hydraulic clamping system verses Toggle clamping systems.
2. Explain different types of blow molding process in brief.
3. With a neat sketch explain the process of ultrasonic welding and state the merits of the process.
