

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

Duration : 3 Hours
Course : DPMT
Subject : Engineering Materials & Heat Treatment

Max. Marks: 60
Date : 02.07.2024
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

- Smallest volume of crystal which gives atomic arrangement is known as
a) space lattice b) crystal structure c) atomic structure d) unit cell.
- Crystallography Material of atoms or molecules arranged in a regular & orderly manner in
a) Visual Circle b) 3D c) 4G d) None of these
- The melting point of iron is
a) 1539°C b) 1601°C c) 1712°C d) 1131°C
- Metals are classified into _____ and _____
- In B.C.C Structure "B" Stands for _____ centered cubic structure.
- Izod and charpy are related to _____ testing
- Brass is an alloy of copper & zinc- say true or false
- Heat treatment of steel which increases its hardness by quenching- say true or false
- The most used mechanical test is tensile test-say true or false
- A.P.F full form is _____
- HRC full form is _____
- C.N. full form is _____

PART – B

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

4 x 2 = 8

- What do you mean by heat treatment of metal?
- Define Unit Cell?
- Define Normalizing?
- Expand about ASTM & its purpose?

PART – C

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

6 x 4 = 24

- Explain the various terms associated with crystallography?
- Classify various types of Heat Treatment Processes?
- Classify the Ferrous Materials and Non Ferrous Materials and their alloys with structure diagram?
- Draw and explain introduction of iron-carbon equilibrium diagram?
- Explain about HSS and its properties, types, uses?
- Explain about destructive and non- destructive tests with examples?
- What are the various hardness tests? Write a short note on Rockwell hardness testing?

PART – D

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

2 x 8 = 16

- Explain about SC, BCC, FCC structures with diagram and write the number of atoms per unit cell, co-ordination number and atomic radius for each structure. for SC structure with neat sketches?
- Describe and draw time temperature transformation diagram with a neat sketch?
- Explain a) Explain Brinell hardness test with a neat sketch?
 b) Briefly explain about impact test with a neat sketch?

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HEAD OFFICE : GUINDY, CHENNAI – 600 032.
ACADEMIC CELL
FOURTH SEMESTER EXAMINATION – JULY 2024

Duration : 3 Hours
Course : DPMT
Subject : Plastics Product & Mould Design

Max. Marks: 60
Date : 03.07.2024
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 allowable deviation for the basic size is known as _____
2. Collapsible core is widely used for _____ Undercut.
3. A mark or line produced on the moldings, formed at the junction of parting surfaces is ____
4. Normally sprue puller is located on cavity side. (Say True or False)
5. Preform is used for making Extruded bottles. (Say True or False)
6. Bubbler cooling system is adapted generally in cavity part of the mould. (Say True or False)
7. The shrinkage occurring after a part has been removed from the mould is called
(a) Differential shrinkage (b) Volumetric shrinkage
(c) Post molding shrinkage (d) Anisotropic shrinkage
8. For thin walled moulding _____ gate is used
(a) Film (b) tab (c) pin (d) sprue
9. The final closing of split cavities will be done by _____
(a) Finger CAM (b) Spring (c) Locking heel (d) Dogleg CAM
10. Expand HCHCR
11. Expand BUR
12. Abbreviation of MTC

PART – B

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

4 x 2 = 8

1. What is meant by sectional view?
2. Define Undercut?
3. What is the purpose of Register Ring?
4. What do you mean by baffles?

PART – C

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

6 x 4 = 24

1. What is shrinkage? Also write down its properties.
2. Explain any two core cooling methods with figure.
3. Explain top plunger transfer mould with neat sketch?
4. Compare compression molding vs. injection molding
5. What are the functions of the screen pack and breaker plate at the die end of the extruder barrel?
6. Explain sub-marine and ring gating system with neat sketch
7. Types of runner cross sections generally used in mould designing and also explain with neat sketch. ?

PART – D

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

2 x 8 = 16

1. Write a short note
a) Bosses & parting line b) sprue puller
2. How many type of actuation methods are used in split mould? Explain any one with figure.
3. Classify various types of extrusion dies and explain any two with neat sketches.

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HEAD OFFICE : GUINDY, CHENNAI – 600 032.
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FOURTH SEMESTER EXAMINATION – JULY 2024

Duration : 3 Hours
Course : DPMT
Subject : Machine Shop Technology-II

Max. Marks: 60
Date : 04.07.2024
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. Milling cutter is mounted on
a) Spindle b) Arbor c) Table d) Mandrel
2. In gang milling operation, simultaneously two or more
a) Spindle are used b) Workpieces are milled c) Cutter are used d) Arbor are used
3. Range of fine size of grain
a) 220 to 600 b) 30 to 60 c) 80 to 100 d) 10 to 24
4. _____ milling cutter is used for producing concave semi-circular surface.
5. Hardness of grinding wheel is specified by _____
6. Soft grade grinding wheels are denoted by ____ to ____ letters
7. Hard grade grinding wheels are recommended for hard material grinding – True / False
8. In centreless grinding the Infeed method is used for grinding long bars – True / False
9. In conventional milling, the cutter rotates in opposite direction of work feed – True / False
10. Abbreviation of rpm
11. Abbreviation of SiC
12. Abbreviation of Al₂O₃

PART – B

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

4 x 2 = 8

1. What is grit in grinding wheel.
2. Write the uses of end – milling cutter
3. Explain the term glazing in grinding operation.
4. Give two reasons why grinding is used in the machine shop

PART – C

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

6 x 4 = 24

1. State the difference between straddle milling and gang milling
2. State the function of grinding.
3. What is profile milling.
4. Application of tool & cutter grinder machine.
5. What are the types of grinding machines.
6. Write function of coolant.
7. What is meant by artificial abrasive with example?

PART – D

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

2 x 8 = 16

1. Write marking system for grinding wheel with example.
2. Draw the horizontal milling machine and explain its parts.
3. Explain the principle of horizontal spindle surface grinding machine with neat sketch.

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HEAD OFFICE : GUINDY, CHENNAI – 600 032.
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FOURTH SEMESTER EXAMINATION – JULY 2024

Duration : 3 Hours
Course : DPMT
Subject : Plastics Processing Techniques

Max. Marks: 60
Date : 05.07.2024
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. Which of the following methods is used for heating of barrel in Extrusion?
a) Induction Heating b) Oil Heating c) Built in Heaters d) All of the given
2. Plastic Injection moulding machines are usually marked by their tonnage capacity which signifies?
a) The weight of machine in Tons b) The maximum force used to close the mould
c) The quantity of material processed by machine per hour d) None of the given
3. The moulds used in thermoforming can be made from
a) Wood b) Aluminium c) Thermosets d) All of these
4. The remaining material after transfer from pot to mould in transfer moulding is called
5. Reaction Injection Moulding is mostly used for materials
6. Helix angle is related to
7. Compression moulding can be used for Thermosets as well as Thermoplastics? True/False
8. Thermoforming is a secondary process? True/False
9. In Drape forming core part of the mould is used. True/False
10. GAIM stands for
11. Full form of NRV is
12. TSE is short form for

PART – B

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

4 x 2 = 8

1. What is the use of Screen pack?
2. Name two products which can be made by Extrusion blow moulding.
3. State two defects associated with Die entry effect and exit problem in extrusion
4. What do you mean by Area ratio in thermoforming?

PART – C

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

6 x 4 = 24

1. Differentiate between Vacuum and Pressure forming?
2. What are the various types of calibration or sizing mechanisms for plastic pipes?
3. Discuss various steps of rotational moulding process.
4. What are the causes and remedies of Jetting and warpage in Injection moulding process?
5. Explain briefly the process of reaction Injection moulding.
6. Write a note on Electroplating of plastic parts.
7. What are the advantages of Ultrasonic welding of Plastics?

PART – D

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

2 x 8 = 16

1. Discuss in detail the process and types of Extrusion Blow Moulding in detail.
2. Explain the functions of various parts of extruder in detail.
3. Describe the process of injection blow moulding with the help of neat sketches.
