

CENTRAL INSTITUTE OF PETROCHEMICALS ENGINEERING & TECHNOLOGY
HEAD OFFICE : GUINDY, CHENNAI – 600 032.
ACADEMIC CELL
SECOND SEMESTER EXAMINATION – JULY 2023

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

Max. Marks: 60
 Date : 04.07.2023
 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

30 x 1 = 30

1. In _____ type of mould, either the cores or the cavities are rotated to automatically withdraw the moldings from the mould.
 a) Collapsible core b) Unscrewing c) Loose threaded core d) Fixed threaded core
2. Benefit of gas assisted injected moulding is _____.
 a) Lower clamping force b) Lower part weight c) Less sink marks d) All of these
3. Shut off valve system are used in _____ of hot runner mould to prevent drooling & leakage of melt at gate area.
 a) Primary Nozzle b) Secondary Nozzle c) Manifold bush d) None of these.
4. _____ method is used for side core actuation.
 a) Finger cam actuation b) Spring actuation c) Hydraulic actuation d) All of the above
5. _____ is a part of hot runner system, which distributes the plastic, melt to each secondary nozzle.
 a) Primary nozzle b) Sprue bush c) Manifold d) Cavity plate
6. _____ material is suitable for blow mould construction
 a) Aluminum alloy b) Beryllium Copper alloy c) Stainless Steel d) All of these
7. _____ is the part of blow mould which will seal or weld the parison.
 a) Blow pin b) Mandrel c) Neck d) Pinch off
8. The function of core rod in injection blow molding is _____.
 a) To form the internal diameter of neck and parison b) To transfer the parison into blow mould
 c) To blow the parison into final shape d) All of these
9. _____ is a type of blown film die.
 a) Fishtail die b) Manifold T die c) Spiral mandrel die d) Parison die
10. _____ is a type of flat film die.
 a) Fishtail die b) Manifold T die c) Coat hanger die d) All of these.
11. _____ is a part of pipe dies.
 a) Manifold b) Spider c) Drop d) Pinch off
12. Dies are classified according to _____.
 a) extrudate b) direction of flow of melt c) the construction d) All of These.
13. Centre Fed die consist of _____.
 a) Mandrel b) Spider c) Die ring d) All of these
14. Manifold T-die consists of _____.
 a) Manifold b) Adjusting lip c) Clamping Screw d) All of the above
15. Rotational mould is designed for _____.
 a) Bottle b) Water storage tank c) Preform d) sheet
16. Rotational moulding machine consists of _____.
 a) Rotating spindle b) Oven c) Cooling chamber d) All of these
17. The pinch off angle in blow mould design is _____.
18. In insert moulding, the metal inserts are generally made up of _____ metal.
19. PET Perform is manufactured by _____ process.
20. _____ is the part of parison die, which will give the hollow shape for parison.
21. Cloth hanger die is a type of _____ die.
22. Stack injection mould is suitable for very high production volumes of shallow parts (True/False).
23. The rotational mould is cooled by air (True/False)
24. There is no mandrel in Sheet die (True /False).
25. In Cold runner mould, the runner is not ejected along with moldings (True/False).
26. Expand GAIM
27. Expand P20 steel
28. Expand HDPE
29. TPI stands for _____ in thread measurement.
30. PCD stands for _____

PART – B

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

4 x 2 = 8

1. In what situations are dog leg cam actions used during mould design?
2. What are the properties of Beryllium Copper Alloy that make it suitable for selection in blow moulding?
3. How does a hot runner mould improve the quality of moulding?
4. List the general features of extrusion dies.

PART – C

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

4 x 3 = 12

1. Draw and explain a water-assisted injection mould and write its advantages as well.
2. Detail the limitations of a hot runner mould and provide solutions for them.
3. How to design a parison and program it for Plastic Jerry Can.
4. Describe the step-by-step procedure for designing a die for an HDPE tube.
5. Explain pressure forming with a neat sketch.

PART – D

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

2 x 5 = 10

1. Explain how the splits are controlled in cam track actuation.
2. Write design considerations for hot runner moulds.
3. Describe the design of a coat-hanger die for producing plastic sheets.

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ACADEMIC CELL
SECOND SEMESTER EXAMINATION – JULY 2023

Duration : 3 Hours
 Course : PD-PMD with CAD/CAM
 Subject : Mould Manufacturing Technology

Max. Marks: 60
 Date : 05.07.2023
 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

30 x 1 = 30

1. An alloy is a _____
 (a) Pure metal (b) Mixture of metals in any proportion
 (c) Mixture of metals in fixed proportion (d) Mixture of two non-metals
2. Bronze is an alloy of _____
 (a) Copper and Nickel (b) Copper and iron (c) Copper and Tin (d) Copper and Aluminium
3. P-type tool steel is _____
 (a) Low alloy special purpose tool steel (b) Water hardening steel
 (c) Cold worked high carbon steel (d) Plastic mould steel
4. The M-code for spindle rotation in clockwise direction is _____
 (a) M09 (b) M08 (c) M03 (d) M06
5. The following is used for holding bored parts for machining their outside surfaces on lathe.
 (a) Mandrel (b) Dogs (c) Driving plate (d) Angle plate
6. An operation performed for enlarging an existing hole up to only a limited length from its one end.
 (a) Boring (b) Drilling (c) Counter-boring (d) Counter-sinking
7. CNC milling machines with _____ are called machining centres.
 (a) Automatic tool changers (b) Automatic workpiece changers
 (c) Automatic programme changers (d) Spindle at machine centre
8. _____ machine is used to do the machining of inside sharp corner in blind square pocket.
 (a) Lathe (b) Shaping (c) EDM (d) Drilling
9. CMM is a _____ inspection system.
 (a) Contactless (b) Contact type (c) Thermal (d) Laser
10. Which one of the following is not an angle measuring device?
 (a) Angle plate (b) Sine bar (c) Bevel protractor (d) Angle Gauge
11. Electroplating is a type of metal _____ process.
 (a) Deposition (b) Removal (c) Joining (d) Forming
12. Surface roughness number (Ra) is expressed in _____.
 (a) μm (b) mm (c) cm (d) m
13. During mould assembly work, for tightening and loosening of socket headed screw is done by _____.
 (a) Screw driver (b) Spanner (c) Allen key (d) Cutting plier
14. Case hardening is a _____ process.
 (a) Machining (b) Forming (c) Heat treatment (d) Metal joining
15. Hardening is done on _____.
 (a) Guide pillar & Guide bush (b) Push back pin (c) Ejector pin (d) All of these
16. Riffilers are types of files. Say True or False.
17. Non-conductive materials can be machined in EDM. Say True or False.
18. Alloy is a mixture of two or more elements. - Say True or False
19. In wire cut EDM, brass wire is used as electrode material – Say True or False
20. Kirksite is a zinc alloy, which is generally used to make blow moulds – Say True or False
21. The function of _____ is to align mould with machine nozzle.
22. The conventional milling process can also be called as _____
23. Slide fit (H7g6) is suitable for mating guide pillar and guide bush, in which **g** means _____.
24. The purpose of "O" ring is to prevent _____ in cooling circuit.
25. M-Code for tool change is _____.
26. The abbreviation of CAM is _____.
27. The abbreviation of HcHcr is _____.
28. Expand HSS _____.
29. CMM Stands for _____.
30. VMC stands for _____.

PART – B

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

4 x 2 = 8

1. Give examples for nonferrous materials used in mould making.
2. Define heat treatment. Which heat treatment process is done on guide pillar and guide bush?
3. What are the methods of texturing?
4. Write down various tools/items used for mould polishing.

PART – C

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

4 x 3 = 12

1. Write down the application of beryllium copper for mould making.
2. What are the types of CMM? Explain any one type with sketch.
3. Write down the application of CNC lathe machine in mould manufacturing.
4. Explain the alloying elements & their effects in mould steel.
5. Write down the application of EDM in mould making.

PART – D

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

2 x 5 = 10

1. Explain the working principle of EDM with sketch.
2. Explain the various operations performed in vertical milling Machine with sketch.
3. Write short notes on (a) G Codes & M Codes (b) Principles of Electro deposition



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ACADEMIC CELL
SECOND SEMESTER EXAMINATION – JULY 2023

Duration : 3 Hours
Course : PD-PMD with CAD/CAM
Subject : Reverse Engineering & Rapid Prototyping

Max. Marks: 60
Date : 06.07.2023
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

30 x 1 = 30

1. Geometric modeling deals with the mathematical representation of _____
a) Curves b) Surfaces c) Solids d) All of these
2. In reverse engineering process, what refers to the sophistication of the design information that can be extracted from the source code?
a) interactivity b) completeness c) abstraction level d) direction level
3. FDM RP systems are _____ based.
a) Solid b) Liquid c) Powder d) All of these
4. Input to RP systems are _____ Data.
a) Surface b) Cloud point c) Solid d) All of these
5. Rapid Prototyping is also called _____.
a) Two dimensional printing b) Rapid tooling
c) Three dimensional printing d) Reverse Engineering
6. What have become the latest trend for computer-based products and systems of every type?
a) GUIs b) candidate key c) object model d) All
7. Primitives are used to generate _____ modelling
a) wire frame b) solid c) B-spline d) none
8. Rapid prototyping machines understands following format files:-
a) dwg files b) prt files c) stl files d) frg
9. The physical object is converted back into a digital CAD format for _____.
a) RPT b) Reverse Engineering c) indirect tooling d) RP
10. While converting the 3D-CAD models into STL file _____ errors can occur
a) Gaps b) Degenerate facets c) overlapping facets d) All of these
11. After scanning usually a 3D drawing data is converted into _____.
a) Drg. files b) prt files c) stl files d) frg files
12. Which of the following is a Non Contact measuring device:-
a) CMM b) CT scanning c) Probe d) Both a & b
13. Paper is used as RP material in the following RP process :-
a) LOM b) SLA c) laser sintering d) FDM
14. RP systems Photo curing is based on _____ method
a) Single laser beam b) Two laser beam c) Masked lamp d) None
15. Additive manufacturing is also known as _____.
a) 3D printing b) SLA Printing c) Direct digital Manufacturing d) None of these
16. Paper is used as RP material in SLS RP process. Say True or False
17. LOM Stands for Laminated Object Manufacturing Say True or False
18. _____ is a process of retrieving new geometry from a manufactured part by digitizing and modifying an existing CAD model.
19. _____ scanning method is suitable for scanning intricate parts
20. Most rapid prototyping modelling systems build models by layering. Say True or False
21. FDM is an indirect method of Rapid Tooling. Say True or False
22. LOM is stands for _____
23. SLA stands for _____
24. STL file format is used for importing 3D model files in SLA. Say True or False
25. CMM stands for _____
26. _____ manufacturing is also known as Direct Digital Manufacturing.
27. Rapid prototyping process uses heat often from a laser to fuse powdered materials including plastics and metals _____
28. DFA stands for _____
29. Rapid Prototyping is also called _____ printing
30. A _____ model consists of wireframe entities that form the basis to create surface entities.

PART – B

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

4 x 2 = 8

1. Define Reverse Engineering
2. What are the limitations of rapid prototyping?
3. What is soft tooling?
4. Expand SLS and IGES

PART – C

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

4 x 3 = 12

1. List the merits and demerits of LOM?
2. Write a short note on Measuring Devices-contact type & non-contact type.
3. What are the materials used in rapid prototyping?
4. Describe about types of geometric modelling
5. Write a short note Metal Rapid Prototyping.

PART – D

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

2 x 5 = 10

1. Explain RP process chain with a neat sketch
2. Explain Vacuum Casting process
3. Explain Direct Tooling and Indirect tooling

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SECOND SEMESTER EXAMINATION – JULY 2023

Duration : 3 Hours
 Course : PD-PMD with CAD/CAM
 Subject : Process Planning & Cost Estimation

Max. Marks: 60
 Date : 07.07.2023
 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

30 x 1 = 30

1. The cost which varies directly in proportion to every increase or decrease in the volume of production is known as _____
 a) Variable cost b) Fixed Cost c) Semi variable cost d) None
2. Cost accounting is useful for _____
 a) Internal people b) External people c) Managers d) Promoters
3. Sales – cost of goods sold is equal to _____
 (a) Direct cost b) Factory cost c) Profit or loss d) Indirect cost
4. ABC analysis is also known as _____
 a) Total cost control analysis b) Selective inventory control
 c) Bad control analysis d) Quantity control
5. Control chart is a _____
 a) Process monitoring tool b) Process Control Tool c) Both a) and b) d) None of the above
6. Just –in-time (JIT) is the concept of reducing inventories to _____
 a) 50% former stock b) Zero stock
 c) 25% former stock d) 15% of the cost of the product for a planned stock
7. The Main Business process objectives are _____
 a) Customer service b) Profit & Loss c) Employee Satisfaction d) None of these
8. Master schedule is prepared for _____
 a) Single Product continuous production b) Multi product batch production
 c) Assembly product continuous production d) Single product batch production
9. PERT has following time estimate:
 a) One Time Estimate b) Two Time Estimate c) Three Time Estimate d) Four Time Estimate
10. ERP stands for _____
 a) Enterprise Resource Planning b) Efficient Resource Planning
 c) Efficient Resource Procurement d) Enterprise Resource Procurement
11. Balance sheet contains Assets and _____
 a) Expenses b) Sale c) Liability d) Purchase
12. Office Rent is an example of: _____
 a) Variable cost b) Fixed cost c) Semi variable cost d) None of these
13. If Total cost of a product is Rs 50,000 and profit margin is 15% on Sales price then what will be the sale price?
 a) Rs 48,000 b) Rs 60,000 c) Rs 57,250 d) Rs 72,000
14. BEP is a point whereby we reach at _____
 a) Covering Fixed cost b) No profit no loss
 c) Covering Variable cost d) Covering factory cost
15. Overheads is a total of _____
 a) Direct costs b) Fixed costs c) Variable costs d) Indirect costs
16. Selling and Distribution expenses are _____ expenses
17. Process layout is also known as _____
18. Selling price = Total cost + _____
19. Productivity is an average measure of the efficiency of _____.
20. Salary and basic working condition will come under _____ needs
21. Budgeting done for the project which is repetitive in nature is a type of Zero base Budgeting. Say True or false
22. Break even analysis is a decision making tool. Say true or false.
23. Standard time is fixed based on the best effective utilisation of resources in the past years. Say True or false.
24. Sunk cost is irrelevant for the purpose of decision making. Say true or false
25. Prime cost does not include indirect cost. Say true or false.

26. BOM stands for _____.
27. DFA stands for _____.
28. Cutting speed of tool = _____.
29. EOQ stands for _____.
30. COP in costing stands for _____.

PART – B

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

4 x 2 = 8

1. What is idle time in production?
2. Explain the term Process Planning
3. What is the difference between Direct Material and Indirect Material
4. What is Depreciation?

PART – C

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

4 x 3 = 12

1. Explain the steps involved in calculation of man-hours and machine-hours availability
2. What factors are taken into consideration in Machine Selection?
3. Define break-even point and how to calculate break-even quantity?
4. Define cost estimating and explain its objectives ?
5. What is Simplification/Variety Reduction?

PART – D

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

2 x 5 = 10

1. Explain various overheads with examples
2. Write short note on following
 - a) Method study
 - b) Job Production
3. What are the Steps involved (procedure) in process planning?
