CENTRAL INSTITUTE OF PETROCHEMICALS ENGINEERING & TECHNOLOGY
HEAD OFFICE: GUINDY, CHENNAI – 600 032.
ACADEMIC CELL
SECOND SEMESTER EXAMINATION - JULY 2022

Duration : 3 Hours   Max. Marks: 60
Course : PD PMD with CAD/CAM   Date : 19.07.2022
Subject : Plastics Mould Design – II   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. There is no wastage of feed system in _____.
    a) Cold runner mould   b) Hot runner mould   c) Stack mould   d) Transfer mould
2. What is the part of hot runner mould, which conveys the molten material from manifold to cavity?
    a) Primary Nozzle   b) Secondary Nozzle   c) Manifold bush   d) shut off Valve
3. _____ .is suitable for very high production volumes of shallow parts.
    a) Gas assisted injection mould   b) Stack injection mould
    c) Unscrewing injection mould   d) None of these
4. Unscrewing mechanism is not operated by_____.
    a) Rack & Pinion   b) Hydraulic Cylinder & Rack   c) Hydraulic actuation   d) Electric motor & Gear
5. Insert moulding is difficult in.
    a) Injection moulding   b) Compression moulding   c)Transfer Moulding   d) Roto moulding
6. The term "cull" is associated with_____.
    (a) Semi positive compression mould   b) Pot type transfer mould
    (c) Injection mould   d)Blow mould
7. For thermosetting material the time required to cross-link is called_____.
    a) Breathing time   b) Curing Time   c) Ejection time   d) Idle time
8. In compression mould, the space provided above the cavity to accommodate loose plastic powder materialis Called_____..
    a) Pot   b) Loading Chamber   c) Cull   d) Cold slug well
9. By empirical method, the electrical energy requirements to heat a mould is_____..
    a) 5 to 10 watts/kg   b) 10 to 20 watts/kg   c)20 to 40 watts/kg   d) 200 to 400 watts/kg
10. In extrusion blow moulding, the bottle is formed by blowing the thermoplastic molten tube called_____.
    a) Perform   b) pinch off   c) parison   d) mandrel
    a) Injection moulding b) Blow moulding   c) Compression moulding d)Transfer moulding
11. _____is provided in extrusion blow mould to accommodate the excess and unwantedplastic melt at neck and pinch off part of blow mould.
    a) Venting   b) Flash Pocket   c) O-ring   d) Blow pin
12. The textured surface of blow mould cavity is obtained by_____.
    a) Sand blasting   b) Chemical Etching   c) Electric Discharge Machining   d) All of these.
13. _____is the part of parison die, which will give the hollow shape for parison.
    a) Screen pack   b) Mandrel   c) Pinch off   d) Manifold
14. What is the range of blow pressure required for extrusion blow moulding process?
    a) 1 to 2 bar   b) 2 to 20 bars   c) 50 to 100 bars   d) 100 to 200 bars
15. _____is used in extruder to filter the contaminants from the plastic melt.
    a) Breaker plate   b) Screen pack   c)Blower   d) Adapter
16. _____is a part of pipe dies.
    a) Manifold   b) Spider   c) Drop   d) Pinch off
17. _____is a type of sheet die.
    a) Centre feed die   b) Manifold T-die   c) Spiral die   d) Side feed die
18. Blow-up ratio is the ration of the _____ diameter to the_____ diameter.
19. _____Material is best suitable for Rotational mould manufacturing.
    a) Stainless steel   b) Aluminum   c) Copper   d) Both (a) & (b)
20. Abbreviation of Be-Cu is_____.
21. _____Gas is used in gas assisted injection moulding process
22. In EN8 steel, EN stands for _____.
23. The ratio of the volume of the loose plastic powder to the volume of the moulding is called_____.
24. The pinch off angle in blow mould design is_____.

25. PET Preform is manufactured by_____ process.
26. In insert moulding, the metal inserts are generally made up of Brass metal - Say true or False
27. In rotational moulding process, the mould is rotated in Three axis – Say true or False
28. Bottle is manufactured by rotational mould. – Say true or False
29. The collapsible core design is suitable for internally threaded component. Say True or False.
30. The approach section of extrusion die is a convergent channel section - Say true or False

PART – B
Answer **all** questions (Max. 40 words)   4 x 2 = 8

1. Name the types of mould design adopted for withdrawing the threaded components from the core.
2. What is transfer pot and cull?
3. What is thermoforming mold and its function?
4. What is an Extrusion Die?

PART – C
Answer any **four** questions (Max. 100 words)   4 x 3 = 12

1. What are the types of transfer moulds? Explain any one with neat sketch.
2. Write the advantages and limitations of Hot Runner systems.
3. Draw the neat sketch of Extrusion blow mould design and explain its different parts
4. What is fish tail die? state its advantages
5. Write short notes on Roto mould design.

PART – D
Answer any **two** questions (Max. 300 words)   2 x 5 = 10

1. Explain the working principle of finger cam actuation in Split mould with neat sketch.
2. Write short notes on the following
   a. Gas assisted injection mould   b) Pinch-off design
3. Draw the neat sketch of Extrusion die for any pipe and explain its principal parts.

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ACADEMIC CELL
SECOND SEMESTER EXAMINATION - JULY 2022

Duration : 3 Hours   Max. Marks: 60
Course : PD PMD with CAD/CAM   Date : 20.07.2022
Subject : Mould Manufacturing Technology   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. Mould materials are selected based on _____.
     a) Plastic material   b) Mould life   c) Mould size   d) all of these
2. Materials in which the molecules is the basic structural solid & which have no regular structure known as_____.
     a) Copper   b) Nickel   c) Crystalline   d) None of these
3. Metals are classified into .... and ....
     a) Porus & Non-Porus   b) TMT and Non TMT   c) Ferrous and Non-Ferrous   d) None of these
4. Ferrous material contains _____
     a) Aluminium   b) Zinc   c) Iron   d) None of these
5. Mould materials are available in _____
     a) Steels, Cast Steels & Non Ferrous Materials   b) Glass, Wool, Stone
     c) Sandstone, Abrasive & Emery   d) None of these
6. Non Ferrous material examples is_____
     a) Copper, Brass, Aluminium   b) Diamond, Tungsten
     c) Glass, Abrasives, Stone   d) None of these
7. Materials of typical Steels for Injection Moulds are_____
     a)   Carbon Steel, Alloy Steel, Tool Steel   b) Glass Metal, Gun Metal, Sand Metal
     c)   Wood Metal, Abrasive Material   d) None of these
8. Mould steels classify into - low carbon medium alloy-say True or False
9. Ejector pins Materials are - Hot-work tool steel, chromium base-say True or False
10. The operation mainly done on a shaping machine is
     (a) turning   (b) machining a flat surface   (c) Drilling   (d) grinding
11._____is the main moving part of a shaper.
     (a)   Ram   (b) Column   (c) Saddle   (d) Base
12. In a planer, the tool is stationary and the work piece travels back and forth under the tool. Say True or False
13. Lathe is generally specified as:
     (a)   Swing diameter   (b) Maximum length of the job   (c) Bed length   (d) All
14. Unit of cutting speed
     (a) m/min   (b) m/cm   (c) m/inch   (d) None
15. Feed is defined as the distance that a tool advances into the work during one revolution of the headstock spindle. Say True or False
16. _____is an operation of making a circular hole by removing a volume of metal from the job by a cutting tool.
     (a) Reaming   (b) Grinding   (d) Drilling   (d) Turning
17. Machining operation in which tool rotates and work is stationary is known as _____
     (a)Turning   (b) Shaping   (c) Drilling   (d) All of the above
18. The conventional milling process can also be called as _____.
     (a) Up milling   (b) down milling   (c) End milling   (d) None of these.
19. In milling operation feed is given by _____
     (a) Moving tool   (b) Moving Job   (c) Both a & b   (d) None.
20. The most important operation in jig boring machine is the accurate way of positioning

21.   In a CNC Lathe Machine, work piece rotates in the _____.
     a) X – axis   b) Y – axis   c) Z – axis   d) none of these.
22.   The abbreviation of CNC is _____
23. Which of the following can be used as dielectric fluids in EDM?
     a)   Kerosene   b) Silicon fluids   c) Distilled water   d) All of the mentioned

24. EDM wire is made of _____
        a) Brass   b) Steel   c) Gold   d) Aluminium

25. In CNC machine tool, the part program entered into the computer memory
        a) Can be used only once   b) Can be used again and again
        c) Can be used again but it has to be modified every time d) Cannot say

26. In polishing, coarse polishing paste is used with a _____ polishing tool.
        a) Hard
        b) Medium
        c) Soft
        d) None of the above

27. Texturing finishes will be decided during _____ stage.
        a) Design
        b) Process
        c) Manufacturing
        d) None of the above

28. The purpose of polishing is _____
        a) Easy release of the moulded part
        b) Preventing rust and corrosion on mould surface
        c) Give smooth finish
        d) All of the above

29. The Surface finish observed on the suitcase is obtained by _____.
        a) Chrome plating   b) Polishing   c) Etching   d) EDM

30. _____ of the following steel has more hardness and is suitable for making Core/Cavity.
        a) EN8   b) EN9   c) HSS   d) P20

PART – B
Answer **all** questions (Max. 40 words)   4 x 2 = 8

1. Mention the properties of the mould materials?
2. What are the different types of controllers used for CNC Machine?
3. What is spark gap?
4. List down the factors which influence Polishability?

PART – C
Answer any **four** questions (Max. 100 words)   4 x 3 = 12

1. Explain about Pantograph Engraving Machine with diagram?
2. What are the difference between machining center and turning center?
3. Explain about IS standards, British standards for mould materials?
4. Explain the machining process of making guide pillar and bush using CNC Programming?
5. Explain about Surface Texturing of Moulds process description?

PART – D
Answer any **two** questions (Max. 300 words)   2 x 5 = 10

1. Explain briefly the effects of mould materials of polishing types & ultrasonic polishing methods?
2. Describe about coordinate measuring machine with different measurement techniques with suitable diagram & systems?
3. Draw a neat sketch of Mould assembly check list, fitting and assembly of various mould Elements & its types?

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SECOND SEMESTER EXAMINATION - JULY 2022

Duration : 3 Hours   Max. Marks: 60
Course   : PD PMD with CAD/CAM   Date : 21.07.2022
Subject : Reverse Engineering & Rapid Prototyping   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 the direct RT methods "Firm" tooling is also known as _____
    A. Bridge Tooling   B. Soft Tooling   C. Hard Tooling   D. All of these
2. Input form of RP materials is _____
    A. Pellets   B. Wire   C. Laminates   D. All of these
3. What have become the latest trend for computer-based products and systems of every type?
    A. GUIs   B. candidate keys   C. Object model   D. All of these
4. Reverse reengineering is the process of deriving the system design and specification from its _____
    A. GUI   B. Database   C. Source code   D. All of these
5. After scanning usually a 3D drawing data is converted into _____
    A. Drg.files   B. prt files   C. stl files   D. frg files
6. The technique that improves the surface finish of RP product is _____
    A. Thick slicing   B. Thin slicing   C. Adaptive slicing   D. Object slicing
7. Sphere is obtained by revolving a _____
    A. Square   B. Rectangle   C. Cylinder   D. All of these
8. Paper is used as RP material in the following RP process
    A. LOM   B. SLA   C. laser sintering   D. FDM
9. _____ is an indirect method of RT
    A. SLS   B. LOM   C. RTV   D. FDM
10. This is a solid shape that fits inside the mold and forms a hole in a cooled cast metal or molten plastic object
    A. Core   B. Cavity   C. Whole mold   D. None of these
11. Wire Frame Modeling consists of _____
    A. Lines   B. Points   C. Arc   D. All of these
12. Rapid prototyping is done to _____ required to produce a physical prototype of an object
    A. Increase the productivity   B. reduce the lead time
    C. Increase the product longevity   D. None of these
13. Most rapid prototyping modeling systems build models by
    A. Injection   B. fusion   C. layering   D. molding
14. The Z810 modeler is known for it's
    A. Low initial cost   B. extreme accuracy   C. speed   D.smooth finished surfaces
15. Investment Casting is also known as
    A. lost wax method   B. layer deposition   C.   additive manufacturing   D. None of these
16. Rapid prototyping process uses heat often from a laser to fuse powdered materials including plastics and metals _____
17. 3D printing also known as _____ manufacturing.
18. _____ scanning method is suitable for scanning intricate parts.
19. Laser stereo lithography requires _____ CAD data in order to create solid models.
20. The core of reverse engineering is an activity called_____
21. Checking 3D CAD data is not the process of pre-processing stage. (Say True or False)
22. Epson salt is the infiltrant used to strengthen parts in Z510 machine. (Say True or False)
23. FDM process is not using laser. (Say True or False)
24. Black is not the colour binder of 3D printer. (Say True or False)
25. Z510 model of 3D printer available in PERDA-TECH. (Say True or False)

26. SLC stands for _____
27. MJP stands for _____
28. DFA stands for _____
29. LASER stands for _____
30. STL format stands for _____

PART – B
Answer **all** questions (Max. 40 words)   4 x 2 = 8

1. Define Reverse Engineering.
2. Write any three types of CAD modeling techniques?
3. What is powder based rapid prototyping?
4. Describe about 3D printing.

PART – C
Answer any **four** questions (Max. 100 words)   4 x 3 = 12

1. Discuss about the role of CMM in Reverse Engineering.
2. What is the role of indirect methods in tool production?
3. Write a short note on electron beam melting?
4. What are the different types geometric modelings? Explain.
5. Write the advantage and disadvantage of solid–based system compared with liquid-based System?

PART – D
Answer any **two** questions (Max. 300 words)   2 x 5 = 10

1. Discuss about the construction and working of laser sintering process.
2. Briefly explain about the laminated object manufacturing process with the help of neat sketches.
3. Write a note on soft and hard tooling? Describe the application area of soft and hard tooling.

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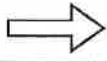Subject : Process Planning & Cost Estimation

Max. Marks: 60
Date : 22.07.2022
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. SIMO stands for_____
2. Work cost = Prime cost + _____.
3. Productivity is an average measure of the efficiency of _____.
   a. Production   b. Machine   c. man   d. None of the above
4. Selling and Distribution expenses are _____ expenses
5. Normal time is calculated by :
   a. Adding fatigue allowance to basic elemental time.
   b. Adding rating factor to basic elemental time.
   c. Multiplying observed elemental time by rating factor.
   d. Adding personal allowance to basic elemental time.
6. Work sampling is used to
   a. Develop standard time for a job
   b. Find the rating factor.
   c. Find the percentage of idle time.
   d. Find the skill required in doing a job.
7. DFA stands for._____.
8. Advertisement comes under
   a. Factory overhead   b.Administrative overhead   c.selling overhead   d.None of these
9. The main objective of work measurement is to
   a. Plan and schedule of production
   b. Estimate the selling prices and delivery dates
   c. Formulate a proper incentive scheme
   d. all of the above
10. BEP stands for_____.
11. A cost which varies directly with volume of output is called fixed cost. Say True or false
12. The diminution in the value of a fixed asset due to use and/or the lapse of time is called
    a. Depreciation Cost b. projected cost   c. estimated cost   d.None of the above
13. The wages of supervisors, foremen, inspectors etc. comes under ,
    a.Supervisory cost   b. Operator cost   c. labour cost   d. all of the above
14. FIFO stands for_____.
15. At the breakeven level, there is situation of no profit no loss. Say True or False
16. Work Measurement and Method Study are same. Say true or false
17. If Total cost of a product is Rs 60,000 and profit margin is 20% on cost then what will be the sale price?
    a. Rs 48,000   b. Rs 60,000   c. Rs 75,000   d. Rs 72,000
18. The sum of Direct Labour, Direct Material and Direct Expenses is known as_____
    a. Prime cost   b. Process cost   c. Direct cost   d. Indirect Cost
19. If the operation uses an operator, the worker is called_____.
    a. Direct Labour   b. Indirect Labour   c. Manual Labour d. none of the above
20. The main purpose of Costing is
    a.Cost determination b.Guidance to management c.Cost Control   d.All of the above.
21. The interchangeability can be achieved by
    a.Standardization   b.Better process planning   c.Bonus plan   d.Better product planning
22. What is the meaning of symbol

    a.Transport   b.Inspection   c.Delay   d.Storage
23. This allowance is given toenable the operator to recover from the physiological and psychological effects (Fatigue)
    a.Relaxation Allowance   b.Process Allowance
    c.Interference Allowance   d.Special Allowances

24. It is the time wasted by the operator due to breakdowns, non-availability or delay in supply of Tools and materials
    a. Set-up Time   b. Handling Time   c. Down Time   d. Tear down time
25. ERP stands for _____
26. Break even analysis (BEP) is a _____ term analysis
    a. Short   b. Long   c. Both   d. None of these
27. _____ Allowance is also known as Delay allowance.
    a. Contingency   b. Relaxation   c. Fatigue   d. All the above
28. Material Ordering cost and Inventory carrying cost are same at...............level
    a. ERP   b. EOQ   c. BEP   d. SAP
29. An example of Indirect Labour is_____
    a) Manager's salary   b) Wages paid to foremen   c) Both (a) & (b)   d) None of these
30. _____ Allowance consists of the allowances given for personnel needs or desire.
    a. Fixed   b. Variable   c. Contingency   d. None of the above

PART – B
Answer **all** questions (Max. 40 words)   4 x 2 = 8

1. Define the term Routing in Process Planning
2. What is Standard time?
3. Explain Variable cost
4. What is the main difference between Budget and Estimate

PART – C
Answer any **four** questions (Max. 100 words)   4 x 3 = 12

1. Draw the Multiple Activity Chart using time scale
2. Define process planning and list the steps involved in process planning.
3. Calculate the net machine-hours available in a factory from the following data for month of June :
    (a) Number of milling machines = 8
    (b) Number of working days = 25
    (c) Number of shifts per day = 2
    (d) Time lost due to maintenance and repairs, etc. = 3 hrs. per day
    (e) Number of hours/shift = 8
4. Distinguish between fixed costs and variable costs.
5. Differentiate between costing and cost estimation

PART – D
Answer any **two** questions (Max. 300 words)   2 x 5 = 10

1. A factory is producing 1000 high tensile fasteners per hour on a machine. The material cost is Rs. 375, labor cost is Rs. 245 and direct expense is Rs. 80. The factory on cost is 150 percent of the total labor cost and office on cost is 30 percent of the factory cost. If the selling price of each fastener is Rs. 1.30, calculate whether there is loss or gain and by what amount?
2. In a manufacturing process, the observed time for 1 cycle of operation is 0.75 min.
   The rating factor is 110%. The following are the various allowances as % of normal time :
   Personal allowance = 3%, Relaxation allowance = 10%,Delay allowance = 2%
3. Explain the parameters involved in material selection.

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