

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

Duration : 3 Hours
 Course : DPT
 Subject : Polymer Science & Engineering

Max. Marks: 60
 Date : 03.01.2022
 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 If the arrangement of alkyl groups on carbon chain is on same side it is called
 a) Syndiotactic b) Isotactic c) Atactic d) None of these
- 2 Weight average molecular weight is determined by ----- method
 a) Light Scattering b) Viscometry c) Osmometry d) None of these
- 3 Diphenyl picryl hydrazide is the example for -----
 a) Initiator b) inhibitor c) catalyst d) Chain transfer agent
- 4 Hexa methylene diamine and adipic acid is used for the synthesis of -----
 a) Nylon 6 b) Nylon 6 6 c) Nylon 6,10 d) Nylon 11
- 5 Dicumyl peroxide is the example for-----
 a) Initiator b) Inhibitor c) Catalyst d) None of these
- 6 Which of the following is the example for branch polymer ?
 a) HDPE b) LDPE c) LLDPE d) Both LDPE & LLDPE
- 7 Chemically modified natural polymer is called -----
 a) Synthetic polymer b) Semi synthetic polymer c) Natural polymer d) None of these
- 8 Styrene Acrylonitrile (SAN) is the example for-----
 a) Polymer b) Co polymer c) Oligomer d) None of these
- 9 -AAAABBBBAAAABBBBAAAA- represents
 a) Block copolymer b) Alternating copolymer c) Random copolymer d) Graft copolymer
- 10 Polymer below T_g are-----
 a) Hard & Brittle b) Soft & Flexible c) Hard & Tough d) None of these
- 11 Inter molecular hydrogen bonding is observed for -----
 a) Nylon 66 b) Poly olefins c) PVC d) None of these
- 12 Which of the following polymer is insoluble and infusible?
 a) Linear Polymer b) Branched Polymer c) Cross linked Polymer d) None of these
- 13 Which of the following is the trade name for polytetra fluoroethylene?
 a) Teflon b) Torlon c) Ryton d) None of these
- 14 Which of the following is the relation between T_g & T_m for unsymmetrical polymer?
 a) T_g=1/2 T_m b) T_g= 2/3 T_m c) T_g=1/3 T_m d) None of these
- 15 Which of the following material is transparent in nature?
 a) PMMA b) LDPE c) PP d) HDPE
- 16 The criteria of monomer for addition polymerization is-----
- 17 Condensation polymerization is also called as ----- Polymerization
- 18 Inhibitors help to -----the free radical polymerization reaction
- 19 Cellulose is the example for-----
- 20 Three dimensional network structure is observed for ----- polymer
- 21 Thermal stability of thermoset polymers is more than thermoplastic polymer- True or False
- 22 Creep is a time independent property of a body at constant stress. Say True or False
- 23 Polymers with carbon chain backbone are easily biodegradable. Say True or False
- 24 HDPE is Less crystalline than LDPE -True or False
- 25 Cellulose Nitrate is the example for semi synthetic polymer-True or False
- 26 Full form of DSC is-----
- 27 Expand DCP which is used for initiator
- 28 Full form of TGA is-----
- 29 Expand GPC
- 30 Full form of CA for semi synthetic polymer is-----

PART – B

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

4 x 2 = 8

1. Define Monomer and Polymer with suitable examples
2. What is the function of inhibitors? Give suitable examples
3. Give two examples each for amorphous and crystalline polymers
4. Define Critical Micelle Concentration (CMC) for Emulsion Polymerization

PART – C

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

4 x 3 = 12

1. Write down the advantages and disadvantages of solution polymerization
2. What is the effect molecular weight on the mechanical properties of polymer?
3. What do you mean by bead or pearl polymerization? Write down two advantages of Solution polymerization
4. What do you mean by rheology? Briefly explain the term Visco elasticity
5. Define Linear, branched and cross linked Polymers with Examples

PART – D

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

2 x 5 = 10

1. Define MFI. Briefly write down the procedure for the determination of MFI for the Polymeric Materials
2. Write short Notes on TGA
3. Briefly discuss about the emulsion Polymerization and also write down its advantages.

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HEAD OFFICE : GUINDY, CHENNAI – 600 032.
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THIRD SEMESTER EXAMINATION – JANUARY - 2022

Duration : 3 Hours
Course : DPT
Subject : Plastics Materials-I

Max. Marks: 60
Date : 04.01.2022
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. Cellulose is Thermo set plastics say True/False
2. Fish Net is made out of POM say True/False
3. Melting point depends on the ----- content in the polymer
(a) Amorphone (b) crystalline (c) Both A& B (d) None of the these
4. Brand Name of PF is -----
5. Full form of PET is-
6. Full form of PC is
7. Urea formaldehyde is Transparent Material say True/False
8. Expand UHMWHDPE
9. ABS has better Impact Strength than HIPS say True/False
10. Expand UF
11. Which of the following is commonly used for Vacuum Forming ?
(a) HIPS (b) MF (c) PP (d) HDPE
12. Which plastic materials contain strong cross linking is their molecular structure ?
(a) Thermoplastic (b) Thermosetting Plastic (c) Elastomers (d) None of these
13. Which Plastic Material is used for Laminate Kitchen work top?
(a) Epoxy (b) Melamine (c) PET (d) PMMA
14. CD is made out of
(a) PC (b) PET (c) PS (d) PMMA
15. Teflon is Trade Name of
(a) PC (b) ABS (c) PTFE (d) PVDF
16. Absolac is Trade Name of -----
17. Good Impact Properties of HIPS is due to presence of ----- in its molecular structure
(a) Plastics (b) Rubber (c) Elastomer (d) None of these
18. Abbreviation of Low Density Polyethylene
19. Write down the Melting Point of Nylon 6,6
20. Shellac is produced from the secretion of an -----
(a) Plant (b) Insect (c) Tree (d) None of these
21. Expand HDPE
22. Nylon is a----- Material
23. Polycarbonate has rigidity up to 140°C say True/False
24. K-Value is measure for
(a) ABS (b) SAN (c) PMMA (d) PVC
25. MEKP is Catalyst for unsaturated Polyester resin cutting say True/False
26. Hexamethylenediamine and ----- for is used Preparation of Nylon 6,6
(a) Sulphuric Acid (b) Adipic Acid (c) Nitric Acid (d) None of These
27. Meting Point of Polyacetal is -----
(a) 250°C (b) 260°C (c) 165°C (d) 265°C
28. Cooker Handle is made out of
(a) UF (b) PF (c) PVC (d) Nylon
29. Choose the Toughest Material among the following.
(a) HDPE (b) PC (c) PMMA (d) PVC
30. Choose the Self Lubricity Material
(a) HDPE (b) PTFE (c) PET (d) PC

PART – B

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

4 x 2 = 8

1. Write down the properties of PMMA
2. Write down the application of Epoxy
3. Name few Engineering Plastics
4. Enlist the properties of PP

PART – C

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

4 x 3 = 12

1. Write short notes on shellac
2. Suggest suitable materials for following products
(a) Jewelry Box (b) Compact disc (c) Fishnet
3. Write down the application of LDPE
4. Define thermosetting plastics
5. Write down properties of PVC

PART – D

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

2 x 5 = 10

1. Explain briefly about properties and application of PET
2. Write short notes on
(a) PC (b) HIPS
3. Why PMMA is widely used for automobile industry ? Explain briefly



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HEAD OFFICE : GUINDY, CHENNAI – 600 032.
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THIRD SEMESTER EXAMINATION – JANUARY - 2022

Duration : 3 Hours
Course : DPT
Subject : Plastics Processing Technology-I

Max. Marks: 60
Date : 05.01.2022
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. Back pressure is applied for _____
a) Better mixing b) Increase Injection pressure c) Increase injection speed d) None of these)
2. Leaking out or flashing occurs at the _____
a) Mould Gate b) Sprue Runner c) Parting Line d) Mould Runner
3. Gap between core and cavity when the mould is fully closed is called _____
a) Maximum Daylight b) Minimum Daylight c) Impression d) None of these
4. The processing technique is mostly used for processing thermoset materials is
a) Injection Moulding b) Blow Moulding c) Compression Moulding d) Extrusion Process
5. Injection Moulding machine can be used to manufacture _____
a) Bottle Caps b) Water Bottles c) Films d) Pipes and Tubes
6. Preform is associated with
a) Injection Moulding b) Thermoforming c) Stretch Blow Moulding d) none of these
7. Injection capacity is specified by _____
a) Cubic inch b) Ounce c) Both a) & b) d) None of these
8. Warpage in a molding can be eliminated by designing the part with _____
a) Acceptable ribs b) Increasing wall thickness of the part c) Effective cooling d) All of these
9. Silver streaks defect arises during molding process could be due to
a) Air trap into the melt b) Moisture content in material c) Both a) & b) d) None of these
10. The heating system of an Extruder can be of
a) Electric type b) Fluid circulation type c) Steam heating type d) Any one of these
11. In blown film extrusion, the BUR is normally in the range of
a) 2:1 to 4:1 b) 5:1 to 7:1 c) 6:1 to 8:1 d) 7:1 to 9:1
12. Which one of the plastics material requires preheating before processing?
a) PC b) PP c) GPPS d) None of these
13. The ratio of the first flight depth of feed zone to the last flight depth of the metering zone is called-

a) L/D Ratio b) Compression ratio c) Bulk ratio d) None of these
14. The shot-to-shot variation in injection molding is due to _____
a) Worn non-return valve b) broken valve ring c) Worn barrel in the valve area d) All of these
15. Larger runner produces _____
a) A better finish on the part b) Minimize weld lines c) Minimize sink marks d) All of these
16. A shallow channel or opening cut in the cavity to allow air or gases to escape as the melt fills the Cavity is called _____
17. Blown films will be classified with thickness _____ than 0.010 inch .
18. The surface texture and appearance of a finished article is called _____ .
19. _____ is used to sense the temperature of barrel.
20. The tendency of a plastic article to turn white or chalky in areas that are highly stressed is called _____ .
21. The channel through which the molten resin flows from the runner into the cavity is called gate. (Say True or False)
22. Pelleting of the material in compression and Transfer molding permits accurate measurement of the charge to the mold—(say True or False)
23. Time required to fill the cavity or mold is called cooling time (Say True or False).
24. Thermoforming is secondary process (Say True or False) .
25. Preform is manufactured by blow molding (Say True or False) .
26. PLC stands for _____
27. NRV stands for _____
28. Full form of BUR _____
29. Full form of L/D ratio _____
30. Full form of EBM _____

PART – B

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

4 x 2 = 8

1. Define Plastics Processing.
2. What is Shot Capacity in Injection Molding process?
3. Define Mould & its types.
4. What is annealing?

PART – C

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

4 x 3 = 12

1. How many type of dies are used in extrusion process?. Name different types of Dies.
2. Differentiate between single screw extruder and twin extruder.
3. Write the advantage of microprocessor based injection molding process over conventional Injection Molding.?
4. Briefly explain about Injection Blow molding process. Name two products produced thorough injection blow Molding Process.
5. Write short note on any two of the following :
(a) Limit switch (b) Thrust Bearing (c) Parison

PART – D

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

2 x 5 = 10

1. Explain with suitable diagram the extrusion process for blown film.
2. Name various types of defects observed in Injection Moulding Process. Explain any four with its cause & remedies.
3. (i) Write various process variables in injection molding Process?
(ii) Explain briefly about parison programming with neat and clean diagram.

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HEAD OFFICE : GUINDY, CHENNAI – 600 032.
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THIRD SEMESTER EXAMINATION – JANUARY - 2022

Duration : 3 Hours
 Course : DPT
 Subject : Engineering Drawing

Max. Marks: 60
 Date : 06.01.2022
 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. Which of the following is not used for fixing the drawing on the board -
 (a) Drawing pins (b) Adhesive tapes (c) Threads (d) Clips
2. Which of the following is the lightest pencil?
 (a) 2B (b) 1B (c) HB (d) H
3. As per the BIS code of specification, maximum width of the title block will be
 (a) 190 mm (b) 180 mm (c) 175 mm (d) 170 mm
4. Principal methods of development of surfaces are -
 (a) Parallel line development (b) Radial line development
 (c) Triangulation development (d) all of the above
5. The size of the title block is _____ mm x _____ mm.
 a) 25 x 10 (b) 100 x 25 (c) 60 x 185 (d) 185 x 65
6. Which is not the use of divider?
 a) To divide curved or straight lines into the desired number of equal parts
 b) To draw circles
 c) To transfer dimensions from one part of the drawing to another part
 d) To set-off given distances from the scale to the drawing
7. Which of the following lines are used to show that the object is cut and then viewed?
 (a) Hidden lines (b) Leader lines (c) Centerlines (d) Hatching Lines
8. Representative fraction is the _____
 (a) The ratio of the length in drawing to the actual length
 (b) The ratio of the actual length to the length in the drawing
 (c) Reciprocal of the actual length
 (d) Square of the length in the drawing
9. What is the type of scale in which the representative fraction is 1:1?
 (a) Enlarged scale (b) Reduced scale (c) Full-size scale (d) Graphical scale
10. In first angle projection method, the relative positions of the object, plane and observers are
 (a) Object is placed in between (b) Plane is placed in between
 (c) Observer is placed in between (d) none of these
11. A point is 20 mm above H.P. and 30 mm in front of V.P. Its top view is
 (a) 20 mm below xy (b) 30 mm below xy (c) 20 mm above xy (d) 30 mm above xy
12. In perspective projection, picture plane is located _____
 (a) Between the station point and the object (b) Before the station point and the object
 (c) After the station point and the object (d) All the above
13. Which bolt is used for lifting heavy machines?
 (a) Hook bolt (b) T- headed bolt (c) Lifting eye bolt (d) Square headed bolt
14. The designation of sheet of size 594 x 841 is
 (a) A0 (b) A1 (c) A2 (d) A3
15. Plumber Block is an example of -.
 (a) Journal bearing (b) Pivot Bearing (c) Collar bearing (d) None of these
16. _____ drawing is prepared for the installation or erection of a machine
17. It is customary for the first sheet of a working drawing set to include _____.
18. In perspective projection, the centre of vision is the point in which the perpendicular axis pierces the _____.
19. If the slant height and base circle radius of the cone are 20 cm and 10 cm respectively. The radius of the development of the curved surface of a cone will be _____
20. _____ type of solid has two bases that are parallel equal polygons.

21. The accuracy of the drawing depends on the quality of the instruments used. True/False
22. 1:10000 is enlarging scale. True/False
23. The perspective will remain same even if the station point changes. True/False
24. A joint is said to be double-riveted, triple riveted etc. accordingly to the number of row of rivet used, True/False
25. In 1st angle projection the left side view will be left side of front view. True/False
26. BOM stands for
27. ASME stands for
28. R.F full form
29. ANSI stands for
30. ASSY stands for

PART – B

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

4 x 2 = 8

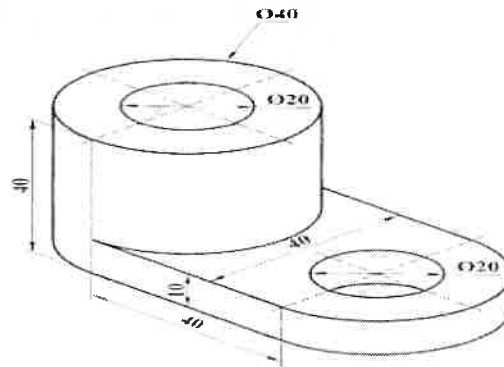
1. Define Representative fraction in scales.
2. Define orthographic projections.
3. What is coupling?
4. Why the Projections of objects not drawn in Second and Fourth Angle of Projections?

PART – C

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

4 x 3 = 12

1. The top view of a 75 mm long line AB measures 65 mm, while the length of its F.V. is 50 mm. Its one end A is in the H.P. and 12 mm in front of V.P. Draw the projections of line AB.
2. Make a complete orthographic drawing (with necessary number of projections) of given model and dimension it.



3. Explain the need of assembly drawing and its importance.
4. What are the different type of coupling used in assembly? Discuss it.
5. Show the symbolic representation of fasteners used in drawing.

PART – D

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

2 x 5 = 10

1. Draw the three views of a cube 30 mm side when it is resting on its base on HP with one of the base edges making an angle of 45° to the VP.
2. A pentagon prism of 25 mm base edges and 50 mm long, resting on its base with an edge of base at 45° to the VP. The prism is cut by a section plane V.T. inclined at 30° to the HP and passes through a point 25 mm from the base along its axis. Develop its lateral surface of the truncated prism.
3. Construct a Diagonal scale of 4 meters length (RF=1/5) and show length 2.69 meter.

PART – B

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

4 x 2 = 8

1. Name Few Ferrous & Non Ferrous Materials.
2. What is the function of guide pillar & guide bush?
3. Why inspection is required in the mould after assembly?
4. Write the safety precautions to be taken during grinding.

PART – C

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

4 x 3 = 12

1. Write the suggested Tools Available For Proper Tool Maintenance.
2. List out the name of mould elements, which is manufactured using CNC Lathe machine?
3. What are the different types of electrode materials used for EDM process?
4. What are the main requirements for selecting steels for making various parts of moulds?
5. List out the basic tool room machines with operations.

PART – D

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

2 x 5 = 10

1. What is the principle of EDM ? Write down the construction & working of EDM with neat sketch.
2. Mention the type of fitting used in mould assembly for parts given below. And describe the function.
a.. Locating Ring b. Sprue Bush c. Push back pin d. Cavity Insert
3. What are the factors affecting the mould life? Explain in brief.
