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Question Bank

Course: Manufacturing Processes-II

Sixth Semester B. Tech. Mech. Engg.

Unit 1:

1. Define abrasive machining and explain its importance.
2. Define abrasive with the help of a single grain having negative rake angle.
3. What is meant by the term ‘friability’? Explain its significance.
4. Material of the abrasive as well as shape and size of the abrasive grain affect its friability. Justify.
5. Explain SiC abrasive material w.r.t. manufacturing, friability characteristics, and applications.
6. What are the superabrasives? Which superabrasive is recommended for grinding of steels and why?
7. Larger the grit number, smaller the grain size. Justify.
8. The major parameters associated with the grinding wheel include grain, bond, and porosity. Justify with the help of schematic diagram.
9. Draw various types of grinding wheel shapes for conventional and superabrasives.
10. Explain the following specifications of the grinding wheels:
    i. 51 C 90 F 12 R 25
    ii. M D 150 P 75 M ZZ 3
11. What is the function of the bonding material? What are its requirements?
12. Which is the most commonly used bonding material? How is it manufactured? What are its merits and demerits?
13. What is an organic grinding wheel? How is it manufactured?
14. Which is the most flexible type of bonding material? How is it manufactured?
15. Define wheel grade and differentiate clearly between hard wheel and a soft wheel.
16. Hard grinding wheels are used for grinding of soft materials. Justify.
17. What is wheel structure? What is its importance? Give the applications of dense and open structured grinding wheels along with reasons.
18. What are the major differences between the action of an abrasive grain and that of a single point cutting tool?
19. Give the expressions for undeformed chip length and thickness during surface grinding. Show all the parameters involved on a schematic diagram.
20. Why is it essential to know the grinding forces?
21. Explain the dependence of the grain force on the process variables.

22. Explain the actions for which energy is dissipated in producing a grinding chip with the help of a schematic diagram.
23. The wear flat on the grain is similar to the flank wear in a single point cutting tool and the same is not desirable. Justify.
24. The specific energy levels in grinding are much higher than those in the turning operation. Justify.
25. What are the ill effects of the grinding temperature? Explain the effect of process variables on the rise in the surface temperature during grinding.
26. Explain the damaging effects of high surface temperature during the grinding process.
27. What is the importance of grinding wheel wear? Explain the mechanisms involved.
28. Show the different wear regions for a grinding wheel graphically. Explain all the regions.
29. Define G-ratio and explain why it varies widely.
30. During grinding, a particular wheel may act soft or hard regardless of the wheel grade. Justify.
31. What is dressing of a grinding wheel? Why is it required?
32. Differentiate clearly between wheel loading and glazing.
33. Explain the different techniques of wheel dressing with the help of schematic diagrams.
34. Differentiate clearly between dressing and truing of a grinding wheel.
35. What is Grindability of a material? What are its indices? How can it be enhanced?
36. Compare traverse and plunge grinding operations during surface grinding with the help of a schematic diagram.
37. Draw schematic diagrams of following types of surface grinding operations (i) Horizontal spindle, reciprocating table (ii) Vertical spindle, rotory table.
38. Draw schematic diagram of cylindrical grinding and give its specifications. What is a universal grinder?
39. Draw schematic diagrams of following internal grinding operations: (i) Plunge (ii) Traverse
40. What is centerless grinding? Draw its schematic diagram. Differentiate between through-feed and in-feed types.
41. What is creep-feed grinding? What is the value of possible wheel depth of cut? What types of grinding wheels are used? What are the requirements of such grinding machines?
42. What is the importance of using a grinding fluid? Give the general recommendations for the same during grinding of Al, Ni, and steels.
43. Grinding fluid is applied under high pressure. Justify.
44. What are the various design considerations for grinding?
45. Explain honing process w.r.t. honing tool, it's mounting, and motion; schematic diagram, and surface pattern produced.
46. Compare honing with superfinishing process.
47. Discuss lapping process w.r.t. lap, abrasive particles, lapping pressures, dimensional tolerance, and schematic diagram.

Unit 2:

1. What is mechanics of metal cutting? What are its objectives?
2. Define metal cutting and draw a schematic diagram showing the workpiece, cutting tool, and chip.
3. Draw a neat and labelled 3-D diagram of a single point cutting tool.
4. Describe shank, flank, face, nose, nose radius, and cutting edges.
5. Explain the significance of principal cutting edge angle, and auxiliary cutting edge angle with the help of a schematic diagram.
6. Explain the back rake angle, side rake angle, positive rake angle, and negative rake angle with the help of a schematic diagram.
7. The rake angle of HSS tool material is more (i.e. positive) but for the cemented carbides, it is less (i. e. negative). Justify.
8. Explain the side clearance angle, and end clearance angle with the help of a schematic diagram.
9. Show all the angles and nose radius of a single point cutting tool on the different views of a single point cutting tool.
10. Define cutting speed, feed, and depth of cut during turning operation.
11. Define undeformed chip thickness and cutting ratio. What is the importance of the cutting ratio?
12. Differentiate clearly between orthogonal cutting and oblique cutting with the help of a schematic diagram.
13. Describe the chip formation process and its significance. Draw a schematic diagram showing undeformed chip thickness, chip thickness, shear angle, primary shear zone, secondary shear zone, rake angle, and clearance angle.
14. Define shear plane, shear angle, chip velocity, shear velocity, primary shear zone, and secondary shear zone.
15. Explain the effect of shear angle on chip thickness using a schematic diagram.
16. Describe segmental type of chips w.r.t. meaning, mechanism of formation, favourable factors for ductile and brittle materials, merits, and demerits.
17. Describe continuous type of chips w.r.t. mechanism of formation, favourable factors, advantages and difficulties.
18. Describe continuous chips with built-up edge w.r.t. mechanism of formation, favourable factors, merits, and demerits.
19. Explain the mechanism of formation of Non-homogeneous Chips. What are the characteristics of the materials prone to this type of chip?
20. Show the main cutting force, thrust force and resultant force on a schematic diagram.
21. What is the necessity of measurement of cutting forces? Which is the most commonly used device for the same and what are its requirements?
22. Explain the basic principle of measurement of cutting forces. Draw a simple single-component mechanical dynamometer.
23. Explain the working of a two-component mechanical type of dynamometer using a schematic diagram.

24. Explain in brief, the principle of working of strain-gauge type and piezoelectric type of dynamometer.
25. Define specific cutting energy. What is its importance? What are the parameters affecting it?
26. Explain the effect of cutting speed and undeformed chip thickness on the specific cutting energy with the help of a graph.
27. What is meant by a plowing force? Explain the concept using a schematic diagram.
28. Explain the concept of size effect in metal cutting using suitable diagrams.
29. Define cutting ratio and derive an expression for shear angle in terms of cutting ratio and rake angle.
30. The chip thickness (a_o) can either be measured directly with a ball-ended micrometer or obtained from the weight of a known length of chip. Justify.
31. Derive an expression for undeformed chip thickness in terms of feed and principal cutting edge angle.
32. Prove that undeformed chip thickness is equal to feed during orthogonal cutting.
33. What is Merchant's circle diagram? Explain the assumptions made during its analysis.
34. Draw a Merchant's circle diagram for orthogonal cutting with the help of cutting tool having positive rake angle. Show all the relevant forces and angles on the diagram.
35. Draw a Merchant's circle diagram for orthogonal cutting with the help of cutting tool having zero rake angle. Show all the relevant forces and angles on the diagram.
36. Derive the expression for coefficient of friction in terms of cutting force, thrust force, and rake angle with the help of Merchant's circle diagram.
37. Derive the expression for shear force, normal to shear force, and apparent shear strength of the work material with the help of Merchant's circle diagram.
38. At small values of feed, shear strength increases with a decrease in feed (or in undeformed chip thickness). Justify.
39. In metal cutting, value of the mean shear strength of the work material is constant and independent of the cutting speed and rake angle under the normal range of cutting conditions. Justify.
40. Derive the expression for main cutting force in terms of shear force, shear angle, rake angle, and angle of friction.
41. Derive the expression for thrust force in terms of shear force, shear angle, rake angle, and angle of friction.
42. Define shear strain and derive expression for the same in terms of rake angle and shear angle using Piispanen's card model.
43. Explain the relationships between shear strain, shear angle, and rake angle with help of a suitable graph.
44. Derive the expression for minimum shear strain theory.
45. Give the assumptions, basis and approach for getting the expression of Merchant's shear angle theory.
46. Derive the expression for Merchant's shear angle theory.
47. What is need of modified Merchant's theory? What are the assumptions made for the same?
48. Derive the expression for modified Merchant's shear angle theory.

49. The results of modified Merchant's theory give certain idea about the machinability of the work materials. Justify.
50. Explain the assumptions of Lee and Shaffer's shear angle theory.
51. Derive the expression for Lee and Shaffer's shear angle theory.
52. Neither of the shear angle theories have good agreement with any of the experimental results. Justify.
53. Discuss friction in metal cutting w.r.t. sliding friction, sticking friction, and distribution of normal stress and shear stress along the chip-tool contact zone.
54. An orthogonal cutting operation is being carried out in which undeformed chip thickness is 0.1 mm, cutting speed = 2 m/s, rake angle is 10^o, and the width of cut = 5 mm. It is observed that the chip thickness is 0.25 mm, thrust force is 200 N and cutting force is 500 N. Calculate the cutting ratio, shear angle, coefficient of friction, friction force, and shear force.
55. A cylindrical bar of 100 mm diameter is orthogonally straight turned with cutting velocity, feed and depth of cut of 120 m/min, 0.25 mm/rev and 4 mm, respectively. The specific cutting energy of the work material is $1\times10^9 \; J/m^3$. Neglecting to contribution of feed force towards cutting power, determine the main or tangential cutting force.
56. An orthogonal cutting operation is performed using a single point cutting tool with a rake angle of 12^0 on a lathe. During turning, the cutting force and the thrust force are 1000 N and 400 N, respectively. If the chip thickness and the uncut chip thickness during turning are 1.5 mm and 0.75 mm, respectively, calculate Shear Force.
57. Determine the shear plane angle, cutting force component and resultant force on the tool for orthogonal cutting of a material with yield stress of 250 N/mm^2. Following are the machining parameters: Tool rake angle = 15°, Uncut chip thickness = 0.25 mm, Chip width = 2 mm, Chip thickness ratio = 0.46, Angle of friction = 40°.
58. Determine the shear plane angle, resultant force on the tool and cutting force component for orthogonal cutting operation of a material with shear yield strength of 200 N/mm^2. The machining data is as follows: Uncut chip length = 100 mm, Length of cut length = 50 mm, Rake angle of tool = 10^o, Width of cut = 1.5 mm, Uncut chip thickness = 0.2 mm Coefficient of friction = 0.8.
59. During machining of C -25 steel with 0-10-6-6-8-90-1 mm (ORS) shaped tripple carbide cutting tool, the following observations have been made: Depth of cut = 0.2 mm, Feed = 0.2 mm/rev, Cutting Speed = 200 m/min, tangential cutting force = 1600 N, thrust force = 850 N, Chip thickness = 0.39 mm, Calculate 1)Shear force 2) Normal force at shear plane 3) Friction force 4) Coefficient of friction 5) Specific cutting energy.
60. In an orthogonal cutting test with a tool of the rake angle 10° the following observations were made: Chip thickness ratio = 0.3, thrust force = 1290 N, tangential cutting force = 1650 N. Calculate the various components of the cutting forces and the coefficient of friction at the tool chip interface.
61. The following data relate to the orthogonal cutting of a component: Feed force: 900 N, Cutting force: 1800 N, Chip thickness ratio: 0.26, Tool rake angle: 12º, Determine: (1) Compression and shear forces (ii) Coefficient of friction of the chip on the tool face.

62. Following data relate to an orthogonal cutting process: Chip length obtained = 96 mm Uncut chip length = 240 mm, Rake angle = 20°, Depth of cut = 0.6 mm, Thrust force and tangential cutting force were 1250 N and 2175 N respectively. Determine the following: (1) Shear plane angle (ii) Chip thickness (iii) Friction angle (iv) Resultant cutting force.
63. In an orthogonal cutting process, it is given that: Rake angle = 10°, Uncut Chip thickness = 1 mm. The measured chip thickness = 1.5 mm, Cutting force = 800 N, Thrust (feed) force = 280 N. Find the values of forces components on both shear plane and tool face. Also, calculate the shear strain, friction coefficient and friction angle.
64. In orthogonal turning of a 50 mm dia. mild steel bar on a Lathe the following data were obtained: Rake angle = 15°, cutting speed = 100 m/min, Feed = 0.2 mm/rev, cutting force = 1800 N, thrust force = 1175 N. Calculate the shear plane angle, coefficient of friction, the chip flow velocity and shear force, if the chip thickness = 0.4 mm.

Unit 3:

1. What is significance of temperature generated during machining? How is the basic mechanism of temperature generation?
2. Derive the expression for cutting ratio in terms of cutting velocity and chip velocity.
3. The maximum temperature generated during machining occurs along the tool face some distance from the cutting edge. Justify.
4. Explain the total rate of heat generation in metal cutting with the help of a simple mathematical equation.
5. Explain the maximum temperature in the chip during metal cutting with the help of a simple mathematical equation.
6. Describe the principle of working of tool-work thermocouple with the help of a schematic diagram. What are the sources of error during this?
7. Discuss the direct tool-work thermocouple used for the measurement of cutting temperature with the help of schematic diagram.
8. Explain the principle of measurement of cutting temperature with radiation methods.
9. Explain the principle of correlation of cutting temperature with hardness and microstructure changes in the cutting tool material.
10. Why is it necessary to understand the tool wear and other forms of tool failure?
11. Explain the various mechanisms of progressive tool wear with the help of suitable examples and diagrams.
12. Differentiate between crater wear and flank wear with the help of schematic diagrams.
13. Draw a typical tool wear curve and explain the three distinct regions in the same.
14. Define tool life criterion and give its significance.
15. Explain the tool life criterion for crater wear with the help of schematic diagrams.
16. Explain the tool life criterion for flank wear with the help of schematic diagrams.
17. What are the ISO tool life criteria for HSS and carbide cutting tool materials?
18. Define tool life and explain the Taylor's tool life equation.
19. Explain the graph of tool life vs cutting speed on logarithmic scale. What is the slope of this graph?
20. Describe the premature tool failure of the cutting tools w.r.t. reasons and importance.
21. Explain the basic requirements of cutting tool materials.
22. What are the major classes of cutting tool materials? Arrange them in the increasing order of toughness.
23. Define hot hardness and show the variation of hardness with temperature for HSS, Carbide, PCBN, and PCD tool materials.
24. Discuss HSS as the most common cutting tool material w.r.t. chemical composition, microstructure, properties, and applications. What is coated HSS?
25. Explain cemented carbides w.r.t. manufacturing, chemical composition, properties, and applications.
26. Differentiate clearly between straight carbides and mixed carbides w.r.t. chemical composition, application, and ISO grades.
27. Discuss coated carbides w.r.t. need, different coating materials, and coating techniques.

28. Explain the basic principle of Chemical Vapour Deposition and Physical Vapour Deposition methods of tool coating.
29. Discuss ceramic cutting tool material w.r.t. manufacturing, properties, applications, and limitations.
30. Explain the most commonly used ceramic cutting tool materials.
31. What are cermets and whisker-reinforced ceramics?
32. Explain CBN and diamond as cutting tool materials.
33. Define machinability and explain why any statement regarding machinability may only apply under the particular set of conditions existing when the observation was made.
34. Why is it necessary to obtain a machinability index or number?
35. What are the difficulties associated with testing of tool wear and machinability?
36. Explain the machinability rating of a given material with the help of a suitable graph.
37. Describe the accelerated wear test and rapid wear test w.r.t. methodology and limitations.
38. Discuss the factors affecting the machinability of metals.
39. What are the main purposes of using cutting fluids in metal cutting?
40. A cutting fluid can act are as a coolant and as a lubricant. Explain with the help of suitable examples.
41. What are the advantages of applying a coolant in metal cutting? Explain the effect of coolant on tool life.
42. Cutting fluid cannot perform its function unless it is effectively delivered to the cutting zone. Justify.
43. Compare the manual and flood cooling methods of application of a coolant.
44. Describe mist cooling technique with the help of schematic diagram.
45. Using the Taylor's tool life equation with exponent $n = 0.5$, if cutting speed is reduced by 50% , then find the ratio of new tool life to original tool life.
46. In a typical turning tool life test, the following data are generated for tools A and B:

Tool Name	Cutting Speed (m/min)	Tool Life (min)
A	200	20
B	150	58

Assuming the same tool life exponent for the tools, calculate the value of constant in the Taylor's tool life equation.

47. Taylor's tool life equation is given by $VT^n = C$, where V is in m/min and T is in min. In a turning operation, two tools X and Y are used. For tool X, $n = 0.3$ and $C = 60$ and for tool Y, $n = 0.6$ and $C = 90$. Find out the cutting speed at which both the tools will have the same tool life.
48. The tool life equation for machine C-40 steel by using HSS tool given by $VT^n = C$. The cutting speed and tool life data is below: V (m/min) 25 and 35; T (min) 90 and 20. Calculate n and C. Also find out the recommended cutting speed for life of 60 minutes.
49. If in turning of a steel rod by a given cutting tool, the tool life decreases from 80 min to 20 min due to increases in cutting velocity from 60 m/min to 120 m/min, then at what cutting velocity the life of that tool under the same condition and environment will be 40 min?

50. During machining of cast iron using high-speed steel, a tool life of 50 minutes was observed with a cutting speed of 100 m/min. Determine the tool life with a cutting speed of 80 m/min. Assume n = 0.09.
51. Determine percentage change in cutting speed required to give 50% reduction in tool life (i.e., to reduce tool life to 1/5 of its previous value). Take n = 0.2.
52. Find the tool life equation if a tool life of 80 min is obtained at a cutting speed of 30 m/min and 8 min at 60 m/min.
53. Compare the tool life of two cutting tools (HSS and carbide) at a speed of 30 m/min. The tool life for both the tools is 30 min. The tool life equation for HSS tool is given by $VT^{1/7} = C1$ and for carbide $VT^{1/5} = C2$ at a cutting speed of 24 m/min.
54. Tool life of 10 hours is obtained when cutting with a single point tool at 63 m/min. If Taylor's constant C = 257.35, what will be the tool life on doubling the velocity?

Unit 4:

1. What is powder metallurgy? Give its applications.
2. Explain powder metallurgy w.r.t. the capabilities, salient features, and the most commonly used materials.
3. What are the various operations involved in powder metallurgy? Show all the operations in a flow diagram.
4. Define atomization method of producing metal powders. Explain gas atomization with the help of a schematic diagram.
5. Explain the process of water atomization with the help of a schematic diagram.
6. Compare gas atomization process with water atomization process.
7. Describe the principle of centrifugal atomization with spinning disk with the help of schematic diagram.
8. Explain the process of atomization with a Rotating Consumable Electrode with the help of schematic diagram.
9. Describe reduction method of powder production w.r.t. basic principle, characteristics of the powder produced, and examples of metals.
10. Explain electrolytic deposition method of powder production w.r.t. basic principle, nature of the powder produced, examples, and schematic diagram.
11. Discuss the carbonyl method of powder production with the help of suitable examples.
12. Describe the crushing and ball milling processes of powder production with the help of schematic diagrams.
13. What is mechanical communition process of powder production? Explain hammer milling process with the help of a schematic diagram.
14. Explain the principle of mechanical alloying process of powder production with the help of schematic diagrams.
15. Explain precipitation from a chemical solution, machining and vapour condensation processes of powder production.
16. Describe nano-powders and micro-encapsulated powders.
17. What is the importance of particle size, shape, and distribution? Explain the screening method of particle size analysis.
18. Explain the sedimentation method of particle size analysis with the help of appropriate diagram.
19. Discuss microscopic analysis, light scattering, and optical methods of powder particle analysis.
20. Explain the suspending particles method of particle size analysis w.r.t. resistive pulse sensing (RPS), and microfluidic resistive pulse sensing (MRPS).
21. What is aspect ratio in the context of particle shape? What are its values for spherical and needle-like particles? Draw various particle shapes schematically.
22. Define shape factor in the context of shape of a powder particle and draw various particle shapes schematically.
23. Explain particle size distribution. What is its importance?
24. Discuss the purposes of blending of metal powders.
25. What are the precautions to be taken during blending of metal powders?

26. What are the various methods of blending of powder? Draw common bowl geometries for mixing or blending powders.
27. Draw the screw mixer and blade mixer used for blending of metal powders.
28. What are the possible hazards during blending of powder metals? How to prevent it?
29. Describe the process of powder compaction with the help of schematic diagram.
30. The density of the green compact depends on the pressure applied. Justify.
31. Higher the density of the compacted part, the higher are its strength and elastic modulus. Explain.
32. Why the density within the part can vary considerably? How to minimize the density variation?
33. Write in short about equipment of compaction w.r.t. pressure required, press capacity, and types of presses.
34. What is isostatic pressing? Draw schematic diagrams of wet bag and dry bag processes of cold isostatic pressing.
35. Describe hot isostatic pressing with the help of suitable diagrams.
36. What are the advantages and limitations of hot isostatic pressing?
37. Write in short about the punch and die materials used during powder metallurgy.
38. What is sintering? What are the process variables?
39. Explain the functioning of continuous sintering furnace.
40. Write in short about the furnace atmosphere during sintering.
41. Discuss the sintering mechanisms with the help of schematic diagrams.
42. Porosity in the powder metallurgy products is an important characteristic of the process. Explain.
43. What are the various secondary and finishing operations carried out on the powder metallurgy products? Explain coining and sizing.
44. Explain the impregnation and infiltration processes related to powder metallurgy.
45. Discuss various design considerations for powder metallurgy.

Unit 5:

1. Outline the steps involved in processing (a) ceramics and (b) glasses.
2. List and describe the functions of additives in ceramics.
3. Describe the doctor-blade process.
4. Explain the advantages of isostatic pressing.
5. What is jiggering? What shapes does it produce?
6. Name the parameters that are important in drying ceramic products.
7. What is the technical difference between crushing and grinding in the preparation of traditional ceramic raw materials?
8. Describe the slip casting process in traditional ceramics processing.
9. List and briefly describe some of the plastic forming methods used to shape traditional ceramic products.
10. What is the difference between dry pressing and semi-dry (wet) pressing of traditional ceramic parts?
11. What happens to a ceramic material when it is sintered?
12. What is the name given to the furnace used to fire ceramicware?
13. What is glazing in traditional ceramics processing?
14. What is the predominant chemical compound in almost all glass products?
15. What are the three basic steps in the glass-working sequence?
16. Melting furnaces for glass-working can be divided into four types. Name them.
17. Describe the spinning process in glass-working.
18. What is the main difference between the press-and-blow and the blow-and-blow shaping processes in glass-working?
19. There are several ways of shaping plate or sheet glass. Name and briefly describe them.
20. Name and briefly describe the two processes for forming glass fibers.
21. What is the purpose of annealing in glass-working?
22. Describe how a piece of glass is heat-treated to produce tempered glass.
23. Describe the type of material that is commonly used to make windshields for automobiles.
24. Describe the methods by which sheet glass is made.
25. How is glass tubing produced?
26. What is the difference between physical and chemical tempering of glass?
27. What is the structure of laminated glass and Bulletproof glass?
28. How are glass fibers made? What are their sizes?
29. What types of finishing operations are used on ceramics and glasses? Why?
30. What are some of the design recommendations for ceramic and glass parts?

Unit 6:

1. What are some of the reasons why plastic shaping processes are important?
2. Identify the main categories of plastics-shaping processes, as classified by the resulting product geometry.
3. Briefly describe the plastic extrusion process.
4. The barrel and screw of an extruder are generally divided into three sections; identify the sections.
5. What are the functions of the screen pack and breaker plate at the die end of the extruder barrel?
6. What are the various forms of extruded shapes and corresponding dies?
7. What is the distinction between plastic sheet and plastic film?
8. What is the blown-film process for producing film stock?
9. Describe the calendering process.
10. Polymer fibers and filaments are used in several applications. What is the most important commercial application?
11. What is the technical difference between a fiber and a filament?
12. Among the synthetic fiber materials, which are the most important?
13. Briefly describe the injection-molding process.
14. What are the three basic types of clamping units?
15. What is the function of gates in injection molds?
16. What is (a) a parison, (b) a plastisol, and (c) a prepreg?
17. How is thin plastic film produced?
18. List several common products that can be made by thermoforming.
19. What similarities and differences are there between compression molding and closed-die forging?
20. Explain the difference between potting and encapsulation.
21. Describe the advantages of cold-forming plastics over other plastic-processing methods.
22. What are the characteristics of filament-wound products? Explain why they are desirable.
23. Describe the methods that can be used to make tubular plastic products.
24. What is pultrusion? Pulforming?
25. What process is used to make foam drinking cups?
26. How are plastic sheet and plastic film produced?
27. If a polymer is in the form of a thin sheet, is it a thermoplastic or thermoset? Why?
28. How are polymer fibers made? Why are they much stronger than bulk forms of the polymer?
29. What are the advantages of coextrusion?
30. What are the advantages of a three-plate mold over a two-plate mold in injection molding?
31. Discuss some of the defects that can occur in plastic injection molding.
32. Describe structural foam molding.

33. What are the significant differences in the equipment and operating procedures between injection molding of thermoplastics and injection molding of thermosets?
34. What is reaction injection molding?
35. What kinds of products are produced by blow molding?
36. In rotational molding, the starting polymer charge is distributed on the surfaces of the mold cavity by centrifugal force. True or false? Why?
37. What is the form of the starting material in thermoforming?
38. Why cannot thermosetting polymers be used in thermo-forming processes?
39. What is the difference between a positive mold and a negative mold in thermoforming?
40. What are the processes by which polymer foams are produced?