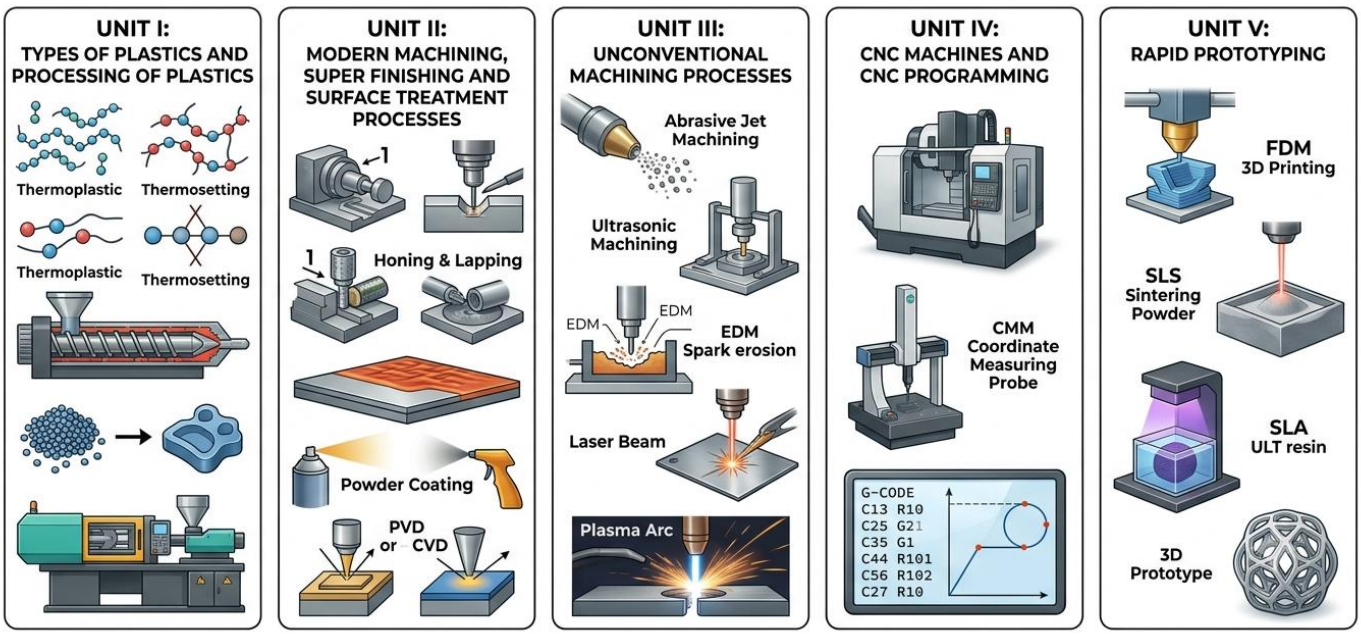
CENTRAL POLYTECHNIC COLLEGE,THARAMANI – 600113.

(An Autonomous Institution)

DEPARTMENT OF MECHANICAL ENGINEERING

QUESTION BANK

EME41010 - Advanced Manufacturing Technology



U.NO	Q NO	QUESTIONS
1	1	What are plastics that cannot be remelted called? (a) Thermoplastics (b) Elastomers (c) Thermosets (d) Composites **Ans:(c) Thermosets**
1	2	What type of plastics can be repeatedly softened by heating? (a) Thermosets (b) Thermoplastics (c) Composites (d) Elastomers **Ans:(b) Thermoplastics**
1	3	What is a plastic made from two or more different materials? (a) Thermoset (b) Elastomer (c) Polymer alloy (d) Composite **Ans:(d) Composite**
1	4	A plastic with a foamed core and a solid outer skin is a: (a) Thermoset (b) Structural foam (c) Elastomer (d) Polymer alloy **Ans:(b) Structural foam**
1	5	What are elastic materials that return to their original shape? (a) Thermosets (b) Elastomers (c) Composites (d) Polymer alloys **Ans:(b) Elastomers**
1	6	A blend of two or more different polymers is known as a(n): (a) Composite (b) Thermoset (c) Polymer alloy (d) Elastomer **Ans:(c) Polymer alloy**
1	7	Which process uses a rotating screw to force plastic through a die? (a) Injection moulding (b) Extrusion (c) Blow moulding (d) Rotational moulding **Ans:(b) Extrusion**
1	8	Which type of extruder is known for better mixing and compounding? (a) Single screw (b) Twin screw (c) Plunger type (d) Reciprocating screw **Ans:(b) Twin screw**
1	9	Which injection moulding type uses a plunger to push plastic? (a) Reciprocating screw (b) Plunger type (c) Gas injection (d) Sandwich moulding **Ans:(b) Plunger type**
1	10	What is a primary function of a reciprocating screw? (a) To cool the plastic. (b) To heat the mold. (c) To melt and inject plastic. (d) To remove the finished part. **Ans:(c) To melt and inject plastic.**

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1	11	Which process creates a hollow part by rotating a mold? (a) Injection moulding (b) Extrusion (c) Rotational moulding (d) Calendaring **Ans:(c) Rotational moulding**
1	12	Which process uses heated rollers to make flat plastic sheets? (a) Injection moulding (b) Extrusion (c) Calendaring (d) Rotational moulding **Ans:(c) Calendaring**
1	13	What is a good design practice for plastic parts? (a) Using sharp corners. (b) Keeping wall thickness uniform. (c) Making the part as thin as possible. (d) Using complex features. **Ans:(b) Keeping wall thickness uniform.**
1	14	Which plastic is used for items needing high heat resistance? (a) Thermoplastics (b) Elastomers (c) Thermosets (d) Composites **Ans:(c) Thermosets**
1	15	Which plastic type is easily recyclable and reusable? (a) Thermosets (b) Thermoplastics (c) Composites (d) Elastomers **Ans:(b) Thermoplastics**
1	16	What is the purpose of the die in extrusion? (a) To melt the plastic. (b) To mix the plastic. (c) To shape the plastic's cross-section. (d) To cool the plastic. **Ans:(c) To shape the plastic's cross-section.**
1	17	What part of a machine forces plastic into the mold? (a) The clamping unit (b) The barrel (c) The injection unit (d) The cooling system **Ans:(c) The injection unit**
1	18	What is the main product of the calendaring process? (a) Hollow bottles (b) Plastic pipes (c) Flat sheets and films (d) Complex solid parts **Ans:(c) Flat sheets and films**
1	19	What is the main function of the single screw in an extruder? (a) To simply push the pellets. (b) To mix, melt, and push material. (c) To cool the plastic. (d) To cut the final product. **Ans:(b) To mix, melt, and push material.**
1	20	Which moulding creates a foamed core with a solid skin? (a) Plunger type (b) Reciprocating screw (c) Structural foam injection moulding (d) Sandwich moulding **Ans:(c) Structural foam injection moulding**

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1	21	Which moulding process uses two different materials to form a core and a skin? (a) Plunger type (b) Gas injection (c) Sandwich moulding (d) Structural foam **Ans:(c) Sandwich moulding**
1	22	What is the main advantage of rotational moulding? (a) High speed. (b) Very thin parts. (c) Ideal for large, hollow shapes. (d) It produces solid parts. **Ans:(c) Ideal for large, hollow shapes.**
1	23	What should be added to corners to reduce stress? (a) Sharp corners (b) Fillets and radii (c) Thin walls (d) Varying thickness **Ans:(b) Fillets and radii**
1	24	Which of these is an example of a thermoset? (a) Polyethylene (PE) (b) Polypropylene (PP) (c) Bakelite (d) Nylon **Ans:(c) Bakelite**
1	25	Which of these is a thermoplastic? (a) Epoxy (b) Bakelite (c) Polyethylene Terephthalate (PET) (d) Melamine **Ans:(c) Polyethylene Terephthalate (PET)**
1	26	A plastic matrix with glass fibers is a type of: (a) Elastomer (b) Thermoset (c) Polymer alloy (d) Composite **Ans:(d) Composite**
1	27	What property do liquid crystal polymers (LCPs) typically have? (a) Low strength (b) High thermal stability (c) Poor chemical resistance (d) Low cost **Ans:(b) High thermal stability**
1	28	What is the function of the clamping unit in moulding? (a) To melt the plastic. (b) To hold the mold halves shut. (c) To inject the plastic. (d) To cool the part. **Ans:(b) To hold the mold halves shut.**
1	29	Calendaring is mainly used for which product? (a) Food packaging films (b) Car bumpers (c) Large storage tanks (d) Complex gears **Ans:(a) Food packaging films**
1	30	What is the main benefit of a reciprocating screw over a plunger? (a) It is more expensive. (b) It combines melting and injection. (c) It works only for thermosets. (d) It is slower. **Ans:(b) It combines melting and injection.**

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1	31	What is used to create a hollow section in gas injection moulding? (a) A plunger (b) A vacuum (c) A blowing agent (d) Inert gas **Ans:(d) Inert gas**
1	32	Why is draft important in plastic part design? (a) To make the part stronger. (b) To make it easier to eject from the mold. (c) To prevent warping. (d) To reduce material cost. **Ans:(b) To make it easier to eject from the mold.**
1	33	What is the purpose of a die head in extrusion? (a) To receive plastic from the screw. (b) To connect the barrel to the die. (c) To heat the plastic. (d) To cool the plastic. **Ans:(b) To connect the barrel to the die.**
1	34	Which process is known for products with uniform wall thickness? (a) Injection moulding (b) Calendaring (c) Rotational moulding (d) Extrusion **Ans:(c) Rotational moulding**
1	35	Which of these is a type of injection moulding? (a) Blow moulding (b) Reciprocating screw (c) Extrusion (d) Thermoforming **Ans:(b) Reciprocating screw**
1	36	What should be avoided to prevent sink marks? (a) Thick sections of material. (b) Uniform wall thickness. (c) Ribs and bosses. (d) Fillets and radii. **Ans:(a) Thick sections of material.**
1	37	What is a disadvantage of a twin screw extruder? (a) It simplifies the process. (b) It is more complex and expensive. (c) It provides better mixing. (d) It only works for simple profiles. **Ans:(b) It is more complex and expensive.**
1	38	What is a "mold" in plastic processing? (a) A type of plastic. (b) A hollow form used to shape molten plastic. (c) A machine that melts plastic. (d) A tool for cutting plastic. **Ans:(b) A hollow form used to shape molten plastic.**
1	39	What are "gates" in injection molding? (a) Large openings for plastic. (b) Small openings that connect runners to mold cavities. (c) Parts that open the mold. (d) Barriers in the machine. **Ans:(b) Small openings that connect runners to mold cavities.**
1	40	Which process makes continuous plastic products like pipes or wires? (a) Injection molding (b) Blow molding (c) Extrusion (d) Thermoforming **Ans:(c) Extrusion**

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1	41	Which plastic is known for its use in heat-resistant electrical parts? (a) Polyethylene (b) PVC (c) Bakelite (d) Nylon **Ans:(c) Bakelite**
1	42	What is the purpose of calendaring in plastic processing? (a) To make bottles. (b) To produce continuous flat plastic sheets. (c) To mold complex 3D shapes. (d) To make plastic pipes. **Ans:(b) To produce continuous flat plastic sheets.**
1	43	What is a main advantage of injection molding? (a) Low equipment cost. (b) High production rate for complex shapes. (c) Suitable for very large products. (d) Can make seamless hollow parts. **Ans:(b) High production rate for complex shapes.**
1	44	What is a disadvantage of extrusion? (a) It can make only short parts. (b) It cannot make continuous products. (c) It is limited to constant cross-section shapes. (d) It is a very slow process. **Ans:(c) It is limited to constant cross-section shapes.**
1	45	Which method is best for large, complex, hollow shapes? (a) Injection molding (b) Blow molding (c) Rotational molding (d) Compression molding **Ans:(c) Rotational molding**
1	46	What is the difference between a single-cavity and a multi-cavity mold? (a) Single-cavity makes more parts. (b) Single-cavity makes one part, multi-cavity makes several. (c) Multi-cavity makes one part. (d) They are the same. **Ans:(b) Single-cavity makes one part, multi-cavity makes several.**
1	47	What is a "short shot" defect in molding? (a) The part is too long. (b) The mold is not completely filled. (c) The part has too much plastic. (d) The part is ejected too early. **Ans:(b) The mold is not completely filled.**
1	48	What is "flash" in plastic molding? (a) A shiny surface. (b) Excess plastic that leaks along the parting line. (c) A defect where the part is too thin. (d) A type of plastic additive. **Ans:(b) Excess plastic that leaks along the parting line.**
1	49	What is the purpose of venting in a mold? (a) To heat the mold. (b) To allow trapped air to escape. (c) To add color to the plastic. (d) To clean the mold. **Ans:(b) To allow trapped air to escape.**
1	50	The main difference between thermoplastics and thermosets is their: (a) Hardness (b) Recyclability by melting (c) Color (d) Weight **Ans:(b) Recyclability by melting**

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1	51	Which additive is added to plastics to improve their flexibility and softness? (a) Plasticizer (b) Filler (c) Stabilizer (d) Pigment **Ans:(nan) Plasticizer**
1	52	Which of the following is an engineering plastic? (a) Cellophane (b) Polycarbonate (c) Paraffin wax (d) Rubber latex **Ans:(nan) Polycarbonate**
1	53	What is the function of the hopper in an extruder? (a) To shape the extrudate (b) To feed raw plastic pellets into the barrel (c) To cool the extrudate (d) To cut the product to length **Ans:(nan) To feed raw plastic pellets into the barrel**
1	54	Which component of an injection mould pushes the solidified part out of the cavity? (a) Sprue bush (b) Locating ring (c) Ejector pin (d) Cooling channel **Ans:(nan) Ejector pin**
1	55	In a plastic composite, the continuous material that binds the reinforcement together is called the: (a) Filler (b) Matrix (c) Skin (d) Runner **Ans:(nan) Matrix**
2	1	What is a key feature of precision machining? (a) Low accuracy (b) High tolerance (c) Fast removal rate (d) Rough finish **Ans:(b) High tolerance**
2	2	Machining at very high cutting speeds is known as: (a) Hot machining (b) Micro machining (c) High-speed machining (d) Ultra precision machining **Ans:(c) High-speed machining**
2	3	What is the main principle of hot machining? (a) Machining at a cold temperature (b) Machining with a cooled workpiece (c) Heating the workpiece to lower its strength (d) Using a hot cutting fluid **Ans:(c) Heating the workpiece to lower its strength**
2	4	Which process is used for making very small features on a workpiece? (a) Honing (b) High-speed machining (c) Micro and nano machining (d) Thermal spraying **Ans:(c) Micro and nano machining**
2	5	Which super finishing process uses a bonded abrasive tool to improve surface finish? (a) Lapping (b) Honing (c) Polishing (d) Buffing **Ans:(b) Honing**

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2	6	What is the purpose of the lapping process? (a) To make a rough surface (b) To achieve a very high dimensional accuracy and surface finish (c) To harden the surface (d) To apply a coating **Ans:(b) To achieve a very high dimensional accuracy and surface finish**
2	7	What is burnishing? (a) A finishing process that removes material (b) A cold working process that plastically deforms the surface (c) A process that adds a coating (d) A process that uses a heated tool **Ans:(b) A cold working process that plastically deforms the surface**
2	8	Which process uses a flexible wheel or belt with fine abrasives to get a bright surface? (a) Honing (b) Lapping (c) Polishing (d) Buffing **Ans:(c) Polishing**
2	9	What is buffing used for? (a) To achieve a high luster or mirror-like finish (b) To remove a large amount of material (c) To create a rough surface (d) To harden a surface **Ans:(a) To achieve a high luster or mirror-like finish**
2	10	What is the purpose of surface hardening? (a) To make a surface softer (b) To improve the hardness and wear resistance of the surface (c) To add a color to the surface (d) To make a surface more flexible **Ans:(b) To improve the hardness and wear resistance of the surface**
2	11	Which process bombards the surface with small spherical media? (a) Electroplating (b) Shot peening (c) Thermal spraying (d) Galvanizing **Ans:(b) Shot peening**
2	12	What is galvanizing? (a) Applying a layer of zinc to a surface (b) Applying a layer of paint (c) Applying a layer of copper (d) Applying a layer of nickel **Ans:(a) Applying a layer of zinc to a surface**
2	13	What is powder coating? (a) A liquid-based coating process (b) Applying a dry powder that is then heated to form a skin (c) A process to remove rust (d) A type of painting **Ans:(b) Applying a dry powder that is then heated to form a skin**
2	14	Which process uses a hot flame or plasma jet to deposit a material onto a surface? (a) Electroplating (b) Thermal spraying (c) Vapour deposition (d) Hot dipping **Ans:(b) Thermal spraying**
2	15	What does CVD stand for? (a) Chemical Vapour Deposition (b) Cold Vapour Deposition (c) Chemical Volume Deposition (d) Cold Volume Deposition **Ans:(a) Chemical Vapour Deposition**

U.NO	Q NO	QUESTIONS
2	16	What is the main principle of PVD? (a) Using a chemical reaction to form a coating (b) Using a physical process to deposit a material in a vacuum (c) Using a hot liquid to form a coating (d) Using a flame to spray a coating **Ans:(b) Using a physical process to deposit a material in a vacuum**
2	17	What is sputtering a type of? (a) Chemical Vapour Deposition (b) Hot dipping (c) Physical Vapour Deposition (d) Electroplating **Ans:(c) Physical Vapour Deposition**
2	18	Which process uses an electric current to coat a metal surface? (a) Hot dipping (b) Cladding (c) Electroplating (d) Painting **Ans:(c) Electroplating**
2	19	What is cladding? (a) A process of applying a layer of paint (b) Bonding two or more metals together by pressure or heat (c) A process of dipping a material into a hot liquid (d) A process to make a surface rough **Ans:(b) Bonding two or more metals together by pressure or heat**
2	20	Which process involves dipping a part into a molten metal bath? (a) Electroplating (b) Cladding (c) Hot dipping (d) Painting **Ans:(c) Hot dipping**
2	21	What is the advantage of hot machining? (a) It requires less power (b) It is slower (c) It makes the material harder (d) It is only for soft materials **Ans:(a) It requires less power**
2	22	Which super finishing process gives a mirror-like finish without removing material? (a) Honing (b) Lapping (c) Burnishing (d) Polishing **Ans:(c) Burnishing**
2	23	What is a main application of shot peening? (a) To apply a coating (b) To remove material (c) To improve fatigue life of a part (d) To add color to a surface **Ans:(c) To improve fatigue life of a part**
2	24	What is the primary purpose of galvanizing? (a) To make a part look better (b) To prevent corrosion (c) To increase part weight (d) To increase electrical conductivity **Ans:(b) To prevent corrosion**
2	25	Which process is used to apply very thin, high-performance coatings in a vacuum? (a) Thermal spraying (b) Hot dipping (c) Vapour deposition (d) Electroplating **Ans:(c) Vapour deposition**

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2	26	What is a disadvantage of electroplating? (a) It is a very fast process (b) It is environmentally friendly (c) It can produce hazardous waste (d) It cannot be used for complex shapes **Ans:(c) It can produce hazardous waste**
2	27	What is the working principle of sputtering? (a) A chemical reaction (b) A flame to spray material (c) Bombarding a target material with ions to eject atoms onto a substrate (d) Dipping a part in a liquid **Ans:(c) Bombarding a target material with ions to eject atoms onto a substrate**
2	28	Which surface treatment process is used for applying a non-conductive, decorative, and protective finish? (a) Electroplating (b) Galvanizing (c) Powder coating (d) Cladding **Ans:(c) Powder coating**
2	29	What is a common application of hot machining? (a) Machining soft materials (b) Machining hard or difficult-to-cut materials (c) Finishing a surface (d) Applying a coating **Ans:(b) Machining hard or difficult-to-cut materials**
2	30	Which of these is a super finishing process? (a) Honing (b) Shot peening (c) Galvanizing (d) Powder coating **Ans:(a) Honing**
2	31	What is the main principle of painting? (a) To add strength (b) To protect and decorate a surface (c) To make a surface harder (d) To remove a layer of material **Ans:(b) To protect and decorate a surface**
2	32	A car body is coated with a layer of zinc. What is this process called? (a) Electroplating (b) Cladding (c) Galvanizing (d) Painting **Ans:(c) Galvanizing**
2	33	What is the main difference between lapping and honing? (a) Lapping is faster (b) Honing uses a bonded abrasive tool, while lapping uses a loose abrasive slurry (c) Lapping is only for flat surfaces (d) Honing is only for external surfaces **Ans:(b) Honing uses a bonded abrasive tool, while lapping uses a loose abrasive slurry**
2	34	What is a common application of electroplating? (a) Coating with zinc (b) Coating with a non-conductive material (c) Coating with a thin layer of chrome or nickel for corrosion resistance and aesthetics (d) Coating with a plastic **Ans:(c) Coating with a thin layer of chrome or nickel for corrosion resistance and aesthetics**
2	35	Which process improves a surface's fatigue resistance by inducing compressive stress? (a) Surface hardening (b) Shot peening (c) Electroplating (d) Painting **Ans:(b) Shot peening**

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2	36	Machining with a very high removal rate is a characteristic of: (a) Ultra precision machining (b) Micro machining (c) High-speed machining (d) Honing **Ans:(c) High-speed machining**
2	37	Which process is used to achieve a very fine, non-directional finish? (a) Honing (b) Lapping (c) Polishing (d) Buffing **Ans:(b) Lapping**
2	38	Which vapor deposition process involves a chemical reaction at the substrate's surface? (a) PVD (b) Sputtering (c) CVD (d) Hot dipping **Ans:(c) CVD**
2	39	What is the main advantage of PVD over electroplating for some applications? (a) PVD is cheaper (b) PVD can coat with a wider range of materials, including ceramics (c) PVD is faster (d) PVD is only for non-metals **Ans:(b) PVD can coat with a wider range of materials, including ceramics**
2	40	A steel part is bonded with a corrosion-resistant layer of stainless steel. What is this process called? (a) Electroplating (b) Galvanizing (c) Cladding (d) Hot dipping **Ans:(c) Cladding**
2	41	What is the working principle of thermal spraying? (a) Melting a material and spraying it onto a surface (b) Dipping a part in a molten material (c) Electrically charging a material (d) Using a chemical reaction to form a layer **Ans:(a) Melting a material and spraying it onto a surface**
2	42	Which process is used to coat a part by dipping it into a molten bath of zinc? (a) Electroplating (b) Cladding (c) Galvanizing (d) Sputtering **Ans:(c) Galvanizing**
2	43	What is the difference between polishing and buffing? (a) Polishing uses a finer abrasive. (b) Buffing uses a finer abrasive for a mirror finish, while polishing removes material for a bright finish. (c) Buffing is for rough surfaces. (d) Polishing uses a bonded abrasive. **Ans:(b) Buffing uses a finer abrasive for a mirror finish, while polishing removes material for a bright finish.**
2	44	What is a key advantage of powder coating over liquid painting? (a) It is less durable (b) It is only for metals (c) It creates a thicker, more durable finish with less waste (d) It is a messy process **Ans:(c) It creates a thicker, more durable finish with less waste**
2	45	Which machining process achieves the highest dimensional accuracy? (a) High-speed machining (b) Hot machining (c) Precision and ultra precision machining (d) Micro machining **Ans:(c) Precision and ultra precision machining**

U.NO	Q NO	QUESTIONS
2	46	What is a disadvantage of hot dipping? (a) It is a very slow process (b) It can result in a thick, uneven coating (c) It is only for small parts (d) It is not good for corrosion protection **Ans:(b) It can result in a thick, uneven coating**
2	47	Which process uses a tool with abrasive stones that move in a combined rotational and reciprocating motion? (a) Lapping (b) Burnishing (c) Honing (d) Buffing **Ans:(c) Honing**
2	48	What is a main application of Physical Vapour Deposition (PVD)? (a) Making plastic parts (b) Coating cutting tools for hardness and wear resistance (c) Coating large metal sheets with zinc (d) Painting car bodies **Ans:(b) Coating cutting tools for hardness and wear resistance**
2	49	What is a disadvantage of Vapour Deposition processes? (a) They are very fast (b) They require high-tech, expensive vacuum equipment (c) They can be used on any material (d) They produce a very thick coating **Ans:(b) They require high-tech, expensive vacuum equipment**
2	50	What does PVD stand for? (a) Physical Vapour Deposition (b) Physical Volume Deposition (c) Process Vapour Deposition (d) Precision Vapour Deposition **Ans:(a) Physical Vapour Deposition**
2	51	Diamond turning is an example of: (a) Hot machining (b) Ultra precision machining (c) Shot peening (d) Hot dipping **Ans:(nan) Ultra precision machining**
2	52	In case hardening by carburizing, which element is diffused into the surface of low carbon steel? (a) Zinc (b) Nickel (c) Carbon (d) Chromium **Ans:(nan) Carbon**
2	53	Which super finishing process is widely used for finishing internal surfaces of engine cylinder bores? (a) Buffing (b) Honing (c) Galvanizing (d) Powder coating **Ans:(nan) Honing**
2	54	In electroplating, the anode is generally made of: (a) The workpiece (b) An insulating material (c) The coating metal (d) Graphite only **Ans:(nan) The coating metal**
2	55	Which cutting tool material is widely used in high-speed machining? (a) High carbon steel (b) Coated carbide (c) Cast iron (d) Mild steel **Ans:(nan) Coated carbide**

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3	1	Which machining process uses a high-velocity stream of abrasive particles carried by a gas? (a) WJM (b) USM (c) AJM (d) EDM **Ans:(c) AJM**
3	2	What is the main principle of Water Jet Machining (WJM)? (a) Electrical energy (b) A high-pressure stream of pure water (c) Abrasive particles (d) A laser beam **Ans:(b) A high-pressure stream of pure water**
3	3	Which process uses a vibrating tool with an abrasive slurry to remove material? (a) EDM (b) LBM (c) USM (d) AJM **Ans:(c) USM**
3	4	What is the working principle of Electrical Discharge Machining (EDM)? (a) Mechanical cutting (b) Thermal energy from sparks (c) Chemical reaction (d) Abrasive blasting **Ans:(b) Thermal energy from sparks**
3	5	Which machining process uses a focused beam of high-speed electrons in a vacuum? (a) EBM (b) LBM (c) PAM (d) CHM **Ans:(a) EBM**
3	6	What is the energy source for Laser Beam Machining (LBM)? (a) An electric current (b) A plasma arc (c) A high-power laser beam (d) A chemical solution **Ans:(c) A high-power laser beam**
3	7	Which process uses a high-temperature plasma arc to melt and remove material? (a) EBM (b) LBM (c) PAM (d) ECM **Ans:(c) PAM**
3	8	What is the main principle of Chemical Machining (CHM)? (a) Mechanical erosion (b) Thermal energy (c) Chemical dissolution of material (d) Electrical discharge **Ans:(c) Chemical dissolution of material**
3	9	Which process uses an electric current to dissolve material from the workpiece? (a) EDM (b) ECM (c) LBM (d) AJM **Ans:(b) ECM**
3	10	What is a main advantage of non-traditional machining processes? (a) They are always faster (b) They can machine hard or complex shapes (c) They require simple tools (d) They are always cheaper **Ans:(b) They can machine hard or complex shapes**

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3	11	Which machining process is often used for cutting non-conductive materials like glass and ceramics? (a) EDM (b) ECM (c) LBM (d) AJM **Ans:(d) AJM**
3	12	What is a common application of Water Jet Machining (WJM)? (a) Machining internal holes (b) Cutting soft materials like paper, cloth, and food (c) Making small holes (d) Machining hard metals **Ans:(b) Cutting soft materials like paper, cloth, and food**
3	13	Which process is used for making intricate holes in hard, brittle materials like ceramics and composites? (a) EDM (b) LBM (c) USM (d) PAM **Ans:(c) USM**
3	14	A die-sinking EDM machine is used for which application? (a) Making very small holes (b) Cutting thin sheets (c) Making complex die cavities (d) Making large holes **Ans:(c) Making complex die cavities**
3	15	Which machining process is known for creating very small, precise holes with a high aspect ratio in any material? (a) LBM (b) EBM (c) PAM (d) ECM **Ans:(b) EBM**
3	16	What is a disadvantage of Plasma Arc Machining (PAM)? (a) Low material removal rate (b) It can only cut soft materials (c) A large heat-affected zone (d) It requires a vacuum **Ans:(c) A large heat-affected zone**
3	17	Which process is used for cutting very thin sheets and for welding? (a) EDM (b) EBM (c) WJM (d) CHM **Ans:(b) EBM**
3	18	What is a key characteristic of LBM? (a) It requires a conductive workpiece (b) It can be used on any material, regardless of hardness or conductivity (c) It requires a vacuum chamber (d) It is a very slow process **Ans:(b) It can be used on any material, regardless of hardness or conductivity**
3	19	Which process removes material from the entire surface exposed to the chemical? (a) USM (b) ECM (c) AJM (d) CHM **Ans:(d) CHM**
3	20	What is a main advantage of Electro Chemical Machining (ECM)? (a) No tool wear (b) High heat generation (c) It is a slow process (d) It can only machine soft materials **Ans:(a) No tool wear**

U.NO	Q NO	QUESTIONS
3	21	Which process is considered a "green" or environmentally friendly process? (a) EDM (b) WJM (c) EBM (d) PAM **Ans:(b) WJM**
3	22	What is the purpose of dielectric fluid used in EDM for? (a) To lubricate the tool (b) To cool the workpiece and flush away debris (c) To speed up the process (d) To create a vacuum **Ans:(b) To cool the workpiece and flush away debris**
3	23	What is a disadvantage of LBM? (a) It is very accurate (b) A large heat-affected zone (c) It is a very fast process (d) It can machine any material **Ans:(b) A large heat-affected zone**
3	24	Which process is best suited for machining intricate shapes on thin, metallic foils? (a) USM (b) CHM (c) EDM (d) WJM **Ans:(b) CHM**
3	25	What is the main advantage of ECM for machining a complex internal shape? (a) It is a cheap process (b) It is a contact-free process, so there is no tool wear and no stress on the workpiece. (c) It has a very high material removal rate (d) It can only machine non-metals **Ans:(b) It is a contact-free process, so there is no tool wear and no stress on the workpiece.**
3	26	Which process is ideal for cutting heat-sensitive materials? (a) EDM (b) LBM (c) WJM (d) PAM **Ans:(c) WJM**
3	27	What is the main disadvantage of USM? (a) It is a very fast process (b) It can only machine hard materials (c) A low material removal rate (d) It is very simple to operate **Ans:(c) A low material removal rate**
3	28	Which process uses a graphite or copper electrode to remove material? (a) AJM (b) EDM (c) EBM (d) ECM **Ans:(b) EDM**
3	29	What is a disadvantage of EBM? (a) It is very fast (b) It requires a vacuum chamber (c) It can machine any material (d) It is a simple process **Ans:(b) It requires a vacuum chamber**
3	30	Which process is used for cutting thick metal plates quickly? (a) LBM (b) EBM (c) PAM (d) ECM **Ans:(c) PAM**

U.NO	Q NO	QUESTIONS
3	31	What is a main disadvantage of CHM? (a) It is very fast (b) It can only be used on metals (c) It requires hazardous chemicals (d) It is a very expensive process **Ans:(c) It requires hazardous chemicals**
3	32	What is the main application of ECM? (a) Cutting thin sheets (b) Machining intricate shapes and burr-free surfaces on conductive materials (c) Machining brittle materials (d) Cutting wood **Ans:(b) Machining intricate shapes and burr-free surfaces on conductive materials**
3	33	Which process is best for cutting brittle, non-metallic materials like glass and quartz? (a) EDM (b) WJM (c) AJM (d) LBM **Ans:(c) AJM**
3	34	Which process does not rely on the workpiece's electrical conductivity? (a) EDM (b) ECM (c) WJM (d) EBM **Ans:(c) WJM**
3	35	Which machining process is a non-contact process? (a) USM (b) EDM (c) WJM (d) All of the above **Ans:(d) All of the above**
3	36	Which process is used for cutting holes in jet engine turbine blades? (a) CHM (b) WJM (c) EBM (d) LBM **Ans:(d) LBM**
3	37	What is a disadvantage of EBM in terms of cost? (a) The machine is cheap to buy (b) It requires a lot of power (c) The machine and vacuum system are very expensive (d) The operating costs are low **Ans:(c) The machine and vacuum system are very expensive**
3	38	Which process creates no heat-affected zone? (a) EDM (b) LBM (c) ECM (d) PAM **Ans:(c) ECM**
3	39	Which process uses an abrasive slurry between a vibrating tool and the workpiece? (a) LBM (b) USM (c) WJM (d) CHM **Ans:(b) USM**
3	40	What is the main purpose of the dielectric fluid in EDM? (a) To conduct electricity (b) To dissolve the workpiece (c) To create sparks (d) To cool the workpiece and prevent short circuits **Ans:(d) To cool the workpiece and prevent short circuits**

U.NO	Q NO	QUESTIONS
3	41	What is a main disadvantage of LBM for thick materials? (a) It is too fast (b) It creates a perfectly straight cut (c) A large taper and heat-affected zone are created (d) It is very simple to operate **Ans:(c) A large taper and heat-affected zone are created**
3	42	What type of material can be machined by ECM? (a) Only non-metals (b) Any material (c) Only electrically conductive materials (d) Only non-conductive materials **Ans:(c) Only electrically conductive materials**
3	43	Which process uses a liquid electrolyte and a shaped electrode? (a) CHM (b) ECM (c) EDM (d) AJM **Ans:(b) ECM**
3	44	What is a main advantage of CHM? (a) It is a very fast process (b) It can machine parts without creating burrs or stress (c) It can only machine small parts (d) It is a very expensive process **Ans:(b) It can machine parts without creating burrs or stress**
3	45	Which process would be best for cutting intricate shapes in a thin sheet of stainless steel? (a) WJM (b) EBM (c) LBM (d) USM **Ans:(c) LBM**
3	46	What is a key characteristic of EBM that makes it a "thermal" process? (a) It uses a chemical reaction (b) It uses a stream of electrons that convert kinetic energy into heat upon impact (c) It uses a liquid (d) It uses an abrasive **Ans:(b) It uses a stream of electrons that convert kinetic energy into heat upon impact**
3	47	Which process is most suitable for drilling tiny holes in hard, conductive materials? (a) WJM (b) EBM (c) EDM (d) AJM **Ans:(c) EDM**
3	48	What is the main advantage of AJM? (a) Low material removal rate (b) No tool wear and ability to machine hard, brittle materials (c) It can only be used on metals (d) It is a contact process **Ans:(b) No tool wear and ability to machine hard, brittle materials**
3	49	Which process is best for cutting a thick plate of steel? (a) WJM (b) EDM (c) PAM (d) CHM **Ans:(c) PAM**
3	50	Which process requires a conducting fluid to operate? (a) AJM (b) WJM (c) USM (d) ECM **Ans:(d) ECM**

U.NO	Q NO	QUESTIONS
3	51	Which medium is commonly used to carry abrasive particles in Abrasive Jet Machining (AJM)? (a) Hydrogen (b) Dry compressed air (c) Acetylene (d) Chlorine **Ans:(nan) Dry compressed air**
3	52	Which abrasive is commonly mixed with water in abrasive water jet cutting? (a) Garnet (b) Chalk (c) Graphite (d) Sawdust **Ans:(nan) Garnet**
3	53	The tool in Ultrasonic Machining (USM) vibrates at a frequency of about: (a) 50 Hz (b) 20 kHz (c) 500 kHz (d) 5 MHz **Ans:(nan) 20 kHz**
3	54	In wire-cut EDM, the tool electrode is a: (a) Graphite block (b) Diamond tip (c) Thin brass wire (d) Ceramic rod **Ans:(nan) Thin brass wire**
3	55	Which electrolyte is commonly used in Electro Chemical Machining (ECM) of steel? (a) Sodium chloride solution (b) Pure distilled water (c) Kerosene (d) Engine oil **Ans:(nan) Sodium chloride solution**
4	1	What is the fundamental difference between a Numerical Control (NC) system and a Computer Numerical Control (CNC) system? (a) NC uses a computer; CNC uses an external computer (b) NC uses punch tapes; CNC uses an internal computer's memory (c) NC is faster; CNC is slower (d) NC can't perform machining; CNC can **Ans:(b) NC uses punch tapes; CNC uses an internal computer's memory**
4	2	Which of the following is a primary advantage of CNC machines? (a) Low initial cost (b) Requires more human operators (c) High accuracy, repeatability, and consistency (d) Limited to simple part geometries **Ans:(c) High accuracy, repeatability, and consistency**
4	3	What is the main working principle of a CNC system? (a) It uses a manual handwheel for control (b) It uses a series of mechanical levers to move the machine (c) It translates a digital program into physical motion (d) It relies on an open-loop feedback system **Ans:(c) It translates a digital program into physical motion**
4	4	A CNC turning centre is primarily used to machine what type of parts? (a) Flat, block-like parts (b) Large sheet metal parts (c) Round, cylindrical, or conical parts (d) Intricate, complex internal cavities **Ans:(c) Round, cylindrical, or conical parts**
4	5	What is the key feature that distinguishes a machining centre from a conventional mill? (a) Its ability to turn a workpiece (b) Its manual control system (c) Its automatic tool changer (ATC) and multi-axis capability (d) Its simple construction **Ans:(c) Its automatic tool changer (ATC) and multi-axis capability**

U.NO	Q NO	QUESTIONS
4	6	In the axes convention for a CNC turning centre, which axis is parallel to the spindle's axis of rotation? (a) X-axis (b) Y-axis (c) Z-axis (d) B-axis **Ans:(c) Z-axis**
4	7	In the axes convention for a CNC milling centre, which axis typically represents the vertical movement of the spindle? (a) X-axis (b) Y-axis (c) Z-axis (d) C-axis **Ans:(c) Z-axis**
4	8	What is a Coordinate Measuring Machine (CMM) primarily used for? (a) Cutting and shaping parts (b) Writing and editing CNC programs (c) Inspecting and verifying the dimensions of a finished part (d) Setting the workpiece origin **Ans:(c) Inspecting and verifying the dimensions of a finished part**
4	9	What is the purpose of the Cartesian coordinate system (X, Y, Z) in CNC programming? (a) To define polar coordinates (b) To specify circular moves (c) To define the machine's axes and positions (d) To set tool offsets **Ans:(c) To define the machine's axes and positions**
4	10	Which coordinate system is most suitable for programming a circular pattern of holes on a face? (a) Cartesian coordinates (b) Polar coordinates (c) Cylindrical coordinates (d) Incremental coordinates **Ans:(b) Polar coordinates**
4	11	In a CNC program, what does absolute positioning (G90) mean? (a) The next move is relative to the previous position (b) All coordinates are referenced from the workpiece origin (G54, G55, etc.) (c) All coordinates are relative to the machine's home position (d) The coordinates are a mix of absolute and incremental **Ans:(b) All coordinates are referenced from the workpiece origin (G54, G55, etc.)**
4	12	In a CNC program, what does incremental positioning (G91) mean? (a) All coordinates are referenced from the workpiece origin (b) The next move is a distance relative to the current position (c) The coordinates are only for circular moves (d) All coordinates are fixed **Ans:(b) The next move is a distance relative to the current position**
4	13	What is the purpose of G-codes in CNC programming? (a) To turn the spindle on/off (b) To specify tool changes (c) To define geometric commands for motion (e.g., rapid, linear cut) (d) To set a program stop **Ans:(c) To define geometric commands for motion (e.g., rapid, linear cut)**
4	14	What is the purpose of M-codes in CNC programming? (a) To define motion commands (b) To specify machine-related, miscellaneous functions (e.g., coolant on, tool change) (c) To set a program's origin (d) To specify a circular cut **Ans:(b) To specify machine-related, miscellaneous functions (e.g., coolant on, tool change)**
4	15	What is the Homing Position of a CNC machine? (a) The origin of the workpiece (b) A specific, fixed position from which all machine coordinates are measured (c) The position where a tool is changed (d) A random position set by the operator **Ans:(b) A specific, fixed position from which all machine coordinates are measured**

U.NO	Q NO	QUESTIONS
4	16	What is a Work Offset used for? (a) To compensate for tool wear (b) To define the location of the workpiece's origin relative to the machine's home position (c) To adjust the spindle speed (d) To turn the coolant on **Ans:(b) To define the location of the workpiece's origin relative to the machine's home position**
4	17	What is the purpose of a Tool Offset? (a) To change the workpiece's location (b) To compensate for the physical length and radius of a cutting tool (c) To set the program's origin (d) To turn the machine on and off **Ans:(b) To compensate for the physical length and radius of a cutting tool**
4	18	Which G-code is used for a rapid, non-cutting move to a specific position? (a) G01 (b) G02 (c) G00 (d) G03 **Ans:(c) G00**
4	19	Which G-code is used for a linear, controlled cutting move at a specified feed rate? (a) G00 (b) G01 (c) G02 (d) G03 **Ans:(b) G01**
4	20	What does the M03 code command the machine to do? (a) Stop the spindle (b) Stop the program (c) Turn the coolant on (d) Turn the spindle on in a clockwise direction **Ans:(d) Turn the spindle on in a clockwise direction**
4	21	Which code is used to turn the coolant on? (a) M08 (b) M09 (c) M30 (d) M05 **Ans:(a) M08**
4	22	In a CNC turning program, what does the command G01 Z-20.0 F100 mean? (a) Rapidly move the tool to Z-20.0 (b) Cut a circle to Z-20.0 (c) Perform a linear cut to Z-20.0 at a feed rate of 100 mm/min (d) Perform a circular cut to Z-20.0 **Ans:(c) Perform a linear cut to Z-20.0 at a feed rate of 100 mm/min**
4	23	Which G-code is used to program a clockwise circular cut? (a) G00 (b) G01 (c) G02 (d) G03 **Ans:(c) G02**
4	24	Which G-code is used to program a counter-clockwise circular cut? (a) G00 (b) G01 (c) G02 (d) G03 **Ans:(d) G03**
4	25	A CNC turning program typically uses which two axes for cutting? (a) X and Y axes (b) X and Z axes (c) Y and Z axes (d) X and A axes **Ans:(b) X and Z axes**

U.NO	Q NO	QUESTIONS
4	26	A CNC milling program for a 3-axis mill typically uses which axes for cutting? (a) X and Y (b) X and Z (c) X, Y, and Z (d) Y and Z **Ans:(c) X, Y, and Z**
4	27	What does tool nose radius compensation do in a turning program? (a) It compensates for the tool's length (b) It adjusts for the spindle speed (c) It compensates for the curvature of the tool's tip (d) It sets the workpiece origin **Ans:(c) It compensates for the curvature of the tool's tip**
4	28	What is the main purpose of tool radius compensation in a milling program? (a) To adjust for tool length (b) To change the workpiece origin (c) To compensate for the difference between the programmed path and the actual cutting path due to the tool's radius (d) To change the cutting speed **Ans:(c) To compensate for the difference between the programmed path and the actual cutting path due to the tool's radius**
4	29	What does the M30 code command the machine to do? (a) Stop the spindle (b) Turn the coolant on (c) End the program and reset to the beginning (d) Turn the spindle on clockwise **Ans:(c) End the program and reset to the beginning**
4	30	The F word in a G01 command specifies what? (a) Feed rate (b) Spindle speed (c) Tool change (d) Coolant on/off **Ans:(a) Feed rate**
4	31	What does the S word in a CNC program typically specify? (a) Feed rate (b) Spindle speed (c) Tool number (d) Coolant on/off **Ans:(b) Spindle speed**
4	32	What does the T word in a CNC program typically specify? (a) Feed rate (b) Spindle speed (c) Tool number (d) Program number **Ans:(c) Tool number**
4	33	What is the purpose of a G28 command? (a) To return the machine to its home position (b) To start a circular cut (c) To set a work offset (d) To turn the spindle on **Ans:(a) To return the machine to its home position**
4	34	Which M-code is used for a program stop? (a) M01 (b) M02 (c) M00 (d) M03 **Ans:(c) M00**
4	35	The command G02 X50.0 Y50.0 I25.0 J0 would create what type of motion? (a) A linear move (b) A clockwise arc (c) A counter-clockwise arc (d) A rapid move **Ans:(b) A clockwise arc**

U.NO	Q NO	QUESTIONS
4	36	The command G03 X-20.0 Y0.0 R20.0 would create what type of motion? (a) A rapid move (b) A linear move (c) A clockwise arc (d) A counter-clockwise arc **Ans:(d) A counter-clockwise arc**
4	37	What is the purpose of an I and J address in a circular interpolation command? (a) To define the end point of the arc (b) To define the radius of the arc (c) To define the center of the arc relative to the starting point (d) To set the feed rate **Ans:(c) To define the center of the arc relative to the starting point**
4	38	What is the main purpose of a G54 command? (a) To turn the coolant on (b) To set a tool offset (c) To select the first work offset (d) To turn the spindle off **Ans:(c) To select the first work offset**
4	39	What is the T0101 code in a CNC program typically used for? (a) Calling tool #1 and activating its offset #1 (b) Setting the spindle speed (c) Turning the coolant on (d) Calling tool #1 only **Ans:(a) Calling tool #1 and activating its offset #1**
4	40	What is the function of the G04 code? (a) To start a rapid move (b) To perform a dwell or pause (c) To start a circular cut (d) To turn the spindle on **Ans:(b) To perform a dwell or pause**
4	41	What is the M06 code used for? (a) Spindle on (b) Coolant on (c) Tool change (d) Program stop **Ans:(c) Tool change**
4	42	What does G92 typically do in a turning program? (a) It sets the absolute coordinates (b) It sets the incremental coordinates (c) It sets the G54 offset (d) It sets the temporary workpiece origin **Ans:(d) It sets the temporary workpiece origin**
4	43	A program line with G17 specifies which plane for circular interpolation? (a) XY plane (b) XZ plane (c) YZ plane (d) All planes **Ans:(a) XY plane**
4	44	A program line with G18 specifies which plane for circular interpolation? (a) XY plane (b) XZ plane (c) YZ plane (d) All planes **Ans:(b) XZ plane**
4	45	A program line with G19 specifies which plane for circular interpolation? (a) XY plane (b) XZ plane (c) YZ plane (d) All planes **Ans:(c) YZ plane**

U.NO	Q NO	QUESTIONS
4	46	Which of the following is an example of a preparatory function? (a) M03 (b) G01 (c) T0101 (d) S1000 **Ans:(b) G01**
4	47	Which of the following is an example of a miscellaneous function? (a) G01 (b) G90 (c) M08 (d) F100 **Ans:(c) M08**
4	48	What is the function of the F code in a G00 command? (a) It has no function in a G00 command (b) It specifies the feed rate (c) It specifies the spindle speed (d) It specifies the tool number **Ans:(a) It has no function in a G00 command**
4	49	When setting a tool offset, what is the value stored in the offset register? (a) The workpiece's zero point (b) The difference between the actual tool length and a standard length (c) The spindle speed (d) The feed rate **Ans:(b) The difference between the actual tool length and a standard length**
4	50	What is the first step in setting up a CNC program's procedure? (a) Setting the tool offset (b) Writing the G-code (c) Homing the machine (d) Setting the spindle speed **Ans:(c) Homing the machine**
4	51	Which device is commonly used for position feedback in a closed-loop CNC machine? (a) Thermostat (b) Encoder (c) Relay (d) Fuse **Ans:(nan) Encoder**
4	52	Which G-code selects the metric (mm) unit system? (a) G20 (b) G21 (c) G90 (d) G91 **Ans:(nan) G21**
4	53	Which M-code is used to stop the spindle? (a) M03 (b) M04 (c) M05 (d) M30 **Ans:(nan) M05**
4	54	Which G-code is used in a CNC lathe for constant surface speed? (a) G94 (b) G95 (c) G96 (d) G97 **Ans:(nan) G96**
4	55	Which element converts the rotary motion of a servo motor into linear table motion in a CNC machine? (a) Ball screw (b) Belt guard (c) Bed casting (d) Chuck jaw **Ans:(nan) Ball screw**

U.NO	Q NO	QUESTIONS
5	1	Which type of manufacturing removes material to create a part? (a) Additive manufacturing (b) Subtractive manufacturing (c) Forging (d) Casting **Ans:(b) Subtractive manufacturing**
5	2	Which type of manufacturing builds a part by adding material layer by layer? (a) Additive manufacturing (b) Subtractive manufacturing (c) Machining (d) Forming **Ans:(a) Additive manufacturing**
5	3	What is a main advantage of additive manufacturing? (a) Fast material removal (b) Can create complex geometries (c) Limited material options (d) High production speed **Ans:(b) Can create complex geometries**
5	4	Which process is the basis for most 3D printing? (a) Subtractive manufacturing (b) Additive manufacturing (c) Forging (d) Stamping **Ans:(b) Additive manufacturing**
5	5	What is a key limitation of additive manufacturing? (a) Difficulty with simple shapes (b) It can only use one type of material (c) Lower strength compared to traditional methods (d) It is a very fast process **Ans:(c) Lower strength compared to traditional methods**
5	6	Which additive manufacturing process uses a liquid photopolymer resin and a UV laser? (a) Fused Deposition Modeling (FDM) (b) Stereolithography (SLA) (c) Laser Sintering (d) 3D Printing **Ans:(b) Stereolithography (SLA)**
5	7	What is the working principle of Laser Sintering? (a) Melting a powder using a laser (b) Curing a liquid resin with a laser (c) Extruding a filament (d) Slicing a block of material **Ans:(a) Melting a powder using a laser**
5	8	Which process uses a heated nozzle to extrude a plastic filament? (a) Stereolithography (SLA) (b) Laser Sintering (c) Fused Deposition Method (FDM) (d) 3D Printing **Ans:(c) Fused Deposition Method (FDM)**
5	9	What is a common material used in Stereolithography (SLA)? (a) Metal powder (b) Thermoplastic filament (c) Photopolymer resin (d) Paper **Ans:(c) Photopolymer resin**
5	10	What is the main principle of 3D printing? (a) To remove material from a block (b) To extrude a hot liquid metal (c) To create a solid object from a digital file by adding layers (d) To deform a material **Ans:(c) To create a solid object from a digital file by adding layers**

U.NO	Q NO	QUESTIONS
5	11	What is "rapid tooling"? (a) The process of making tools slowly (b) Using rapid manufacturing techniques to quickly create molds or dies (c) A type of machining (d) A method for creating prototypes **Ans:(b) Using rapid manufacturing techniques to quickly create molds or dies**
5	12	Which manufacturing method would be best for creating a prototype with intricate internal channels? (a) Milling (b) Turning (c) Additive manufacturing (d) Casting **Ans:(c) Additive manufacturing**
5	13	A manufacturer wants to create a functional prototype with a smooth surface finish. Which process would be a good choice? (a) Fused Deposition Modeling (FDM) (b) Laser Sintering (c) Stereolithography (SLA) (d) 3D Printing **Ans:(c) Stereolithography (SLA)**
5	14	A key application of additive manufacturing is: (a) Mass production of simple parts (b) Creating a solid block of metal (c) Manufacturing complex parts for aerospace and medical industries (d) Removing rust from a metal part **Ans:(c) Manufacturing complex parts for aerospace and medical industries**
5	15	What is the primary purpose of rapid manufacturing? (a) To create parts very quickly for functional use or prototyping (b) To produce parts at a low cost (c) To make very large parts (d) To remove a lot of material **Ans:(a) To create parts very quickly for functional use or prototyping**
5	16	What is a key difference between subtractive and additive manufacturing? (a) Subtractive methods are always faster. (b) Additive methods remove material, while subtractive methods add material. (c) Subtractive methods create waste, while additive methods use material more efficiently. (d) Additive methods cannot create complex shapes. **Ans:(c) Subtractive methods create waste, while additive methods use material more efficiently.**
5	17	What type of material is used in Laser Sintering? (a) Liquid resin (b) Metal or polymer powder (c) Plastic pellets (d) Metal ingots **Ans:(b) Metal or polymer powder**
5	18	What is the most common material used in Fused Deposition Method (FDM) desktop printers? (a) Metal powder (b) Photopolymer resin (c) Plastic filament (e.g., PLA or ABS) (d) Ceramic paste **Ans:(c) Plastic filament (e.g., PLA or ABS)**
5	19	What is the main limitation of the Fused Deposition Method (FDM)? (a) High precision and smooth finish (b) It is a very expensive process (c) Low surface resolution and visible layer lines (d) It can only be used on metal **Ans:(c) Low surface resolution and visible layer lines**

5 20 What is the purpose of support structures in 3D printing?
(a) To make the part stronger (b) To create a shiny surface
(c) To support overhanging features during the building process (d) To remove material from the part
Ans:(c) To support overhanging features during the building process

U.NO	Q NO	QUESTIONS

5 21 What is the primary goal of rapid tooling?
(a) To create final production parts (b) To create prototypes
(c) To reduce the time and cost required to produce molds and dies (d) To remove material
Ans:(c) To reduce the time and cost required to produce molds and dies

5 22 Which of these is a type of additive manufacturing?
(a) Milling (b) Stereolithography
(c) Drilling (d) Forging
Ans:(b) Stereolithography

5 23 What is the main difference between prototyping and rapid manufacturing?
(a) Prototyping is for functional parts, and rapid manufacturing is for non-functional parts. (b) Prototyping is for making models quickly, while rapid manufacturing is for making finished, functional parts quickly.
(c) They are the same. (d) Prototyping is a slow process.
Ans:(b) Prototyping is for making models quickly, while rapid manufacturing is for making finished, functional parts quickly.

5 24 Which process uses a binder to selectively join powder particles?
(a) SLA (b) FDM
(c) Laser Sintering (d) Binder Jetting (another name for a type of 3D printing)
Ans:(d) Binder Jetting (another name for a type of 3D printing)

5 25 A designer wants to create a part with a complex internal cooling channel. What manufacturing process would be a good choice?
(a) Injection molding (b) Casting
(c) Additive manufacturing (d) Machining
Ans:(c) Additive manufacturing

5 26 What does "FDM" stand for?
(a) Fast Direct Molding (b) Filament Direct Method
(c) Fused Deposition Method (d) Fast Direct Manufacturing
Ans:(c) Fused Deposition Method

5 27 What is a disadvantage of subtractive manufacturing compared to additive?
(a) It can only create simple shapes. (b) It often generates more material waste.
(c) It is a very slow process. (d) It is not very accurate.
Ans:(b) It often generates more material waste.

5 28 What is the primary energy source in Stereolithography (SLA)?
(a) Heat (b) A plasma arc
(c) A UV laser (d) A chemical reaction
Ans:(c) A UV laser

5 29 Which process is best for making a large, complex metal part in a short time?
(a) Injection molding (b) Subtractive manufacturing

(c) Laser Sintering (specifically for metals) (d) Machining

Ans:(c) Laser Sintering (specifically for metals)

5 30 What is a common material used in Fused Deposition Method (FDM)?

(a) ABS (b) Aluminum

(c) Glass (d) Steel

Ans:(a) ABS

U.NO	Q NO	QUESTIONS

5 31 Which of the following is a limitation of 3D printing?

(a) The ability to create complex shapes (b) The initial cost of the printer

(c) The ability to create functional prototypes (d) The ability to use different materials

Ans:(b) The initial cost of the printer

5 32 What is the main difference between Fused Deposition Method (FDM) and Stereolithography (SLA)?

(a) FDM uses a powder, and SLA uses a filament. (b) FDM uses a liquid resin, and SLA uses a filament.

(c) FDM uses a solid filament, and SLA uses a liquid resin. (d) FDM and SLA are the same process.

Ans:(c) FDM uses a solid filament, and SLA uses a liquid resin.

5 33 What is the purpose of rapid tooling?

(a) To make finished parts (b) To make tools for other manufacturing processes

(c) To create prototypes (d) To remove material

Ans:(b) To make tools for other manufacturing processes

5 34 What is a characteristic of subtractive manufacturing?

(a) Building a part layer by layer (b) Starting with a block of material and removing from it

(c) It is a very slow process (d) No material is wasted

Ans:(b) Starting with a block of material and removing from it

5 35 What is the main application of the Fused Deposition Method (FDM)?

(a) Creating high-precision metal parts (b) Making cheap prototypes and functional parts

(c) Creating large, seamless parts (d) Making molds for injection molding

Ans:(b) Making cheap prototypes and functional parts

5 36 Which process is most suited for creating a precise, smooth-finished dental mold?

(a) FDM (b) Laser Sintering

(c) Stereolithography (SLA) (d) Subtractive manufacturing

Ans:(c) Stereolithography (SLA)

5 37 What does "SLS" stand for?

(a) Solid Layer Sintering (b) Stereolithography Sintering

(c) Selective Laser Sintering (d) Solid Laser Sintering

Ans:(c) Selective Laser Sintering

5 38 What is a main application of Laser Sintering?

(a) Creating cheap plastic prototypes (b) Creating complex, strong parts from metal or polymer powders

(c) Making smooth, aesthetic parts (d) Making hollow bottles

Ans:(b) Creating complex, strong parts from metal or polymer powders

5 39 What is the main disadvantage of Stereolithography (SLA)?
(a) It is a very fast process (b) The parts are very durable
(c) The materials can be expensive and the parts are often brittle (d) It is a very cheap process
Ans:(c) The materials can be expensive and the parts are often brittle

5 40 What is the most common energy source for Fused Deposition Method (FDM)?
(a) A UV laser (b) A high-power laser
(c) An electric heater (d) A chemical reaction
Ans:(c) An electric heater

U.NO Q NO QUESTIONS

5 41 Which type of manufacturing is similar to a sculptor carving a statue from a block of stone?
(a) Additive manufacturing (b) Subtractive manufacturing
(c) Rapid manufacturing (d) Casting
Ans:(b) Subtractive manufacturing

5 42 Which of these is a form of subtractive manufacturing?
(a) 3D printing (b) Stereolithography
(c) Machining (d) Fused Deposition Method
Ans:(c) Machining

5 43 What is a main characteristic of the Laser Sintering process?
(a) It requires support structures (b) It produces a very smooth, glossy surface
(c) It can create parts from a wide variety of powders (d) It only works on plastics
Ans:(c) It can create parts from a wide variety of powders

5 44 Which of the following is a limitation of 3D printing?
(a) The ability to create a part from a digital model (b) The speed of the process for large, detailed parts
(c) The ability to create functional parts (d) The ability to use different materials
Ans:(b) The speed of the process for large, detailed parts

5 45 A manufacturer wants to produce a custom-fit medical implant quickly. Which technology would be a good choice?
(a) Injection molding (b) Subtractive manufacturing
(c) Additive manufacturing (d) Casting
Ans:(c) Additive manufacturing

5 46 Which process is known for creating functional parts with minimal material waste?
(a) Subtractive manufacturing (b) Additive manufacturing
(c) Forging (d) Stamping
Ans:(b) Additive manufacturing

5 47 What is the main disadvantage of Laser Sintering (SLS)?
(a) It is a cheap process (b) It produces weak parts
(c) It requires expensive equipment and careful handling of the powder (d) It cannot create complex shapes
Ans:(c) It requires expensive equipment and careful handling of the powder

5 48 What is the purpose of the build platform in a 3D printer?
(a) To store the material (b) To provide a stable, flat surface for the part to be built upon
(c) To heat the material (d) To remove the finished part

Ans:(b) To provide a stable, flat surface for the part to be built upon

5	49	Which additive manufacturing process uses a binder to fuse powder particles? (a) SLA (b) FDM (c) Laser Sintering (d) Binder Jetting **Ans:(d) Binder Jetting**
5	50	What does "Rapid Prototyping" primarily refer to? (a) A method for mass production (b) Creating models and prototypes quickly (c) The use of subtractive manufacturing (d) Creating final end-use parts **Ans:(b) Creating models and prototypes quickly**

U.NO	Q NO	QUESTIONS
5	51	Which file format is most widely used to transfer a 3D CAD model to a rapid prototyping machine? (a) DOC (b) STL (c) MP3 (d) PDF **Ans:(nan) STL**
5	52	Which was the first commercially developed rapid prototyping process? (a) Stereolithography (SLA) (b) Fused Deposition Method (FDM) (c) Selective Laser Sintering (SLS) (d) Binder jetting **Ans:(nan) Stereolithography (SLA)**
5	53	Dividing a 3D CAD model into thin horizontal cross-sectional layers is called: (a) Slicing (b) Casting (c) Forging (d) Honing **Ans:(nan) Slicing**
5	54	Which rapid prototyping process bonds thin sheets of paper or plastic layer by layer? (a) Laminated Object Manufacturing (LOM) (b) Stereolithography (SLA) (c) Fused Deposition Method (FDM) (d) Selective Laser Sintering (SLS) **Ans:(nan) Laminated Object Manufacturing (LOM)**
5	55	Which post-processing step is commonly required for parts made by Stereolithography? (a) Annealing in a furnace (b) UV post-curing (c) Galvanizing (d) Shot peening **Ans:(nan) UV post-curing**

PART B

UNIT	PART	Q.NO	QUESTION
1	B	1	Compare thermoplastic and thermosetting plastics with at least three points.
1	B	2	Explain the advantages of composite plastics in automobile applications.
1	B	3	State three applications of elastomers in engineering.
1	B	4	Explain structural foam injection moulding with an example.
1	B	5	Differentiate between sandwich moulding and gas injection moulding.
1	B	6	Write three design considerations while designing plastic components.
1	B	7	Which process is suitable for making thin plastic sheets? Justify your answer.
1	B	8	Why is twin screw extrusion preferred over single screw extrusion in some cases?
1	B	9	Explain one real-life application of rotational moulding.
1	B	10	Why are liquid crystal polymers preferred in electronic components?
1	B	11	List the three functional zones of a single screw extruder and state the function of each.
2	B	1	Explain the principle of high-speed machining with one advantage.
2	B	2	Why is hot machining suitable for cutting hard materials?
2	B	3	Compare honing and lapping.
2	B	4	Explain the importance of burnishing in improving surface finish.
2	B	5	What are the advantages of buffing over polishing?
2	B	6	State three advantages of galvanizing.
2	B	7	Explain powder coating with one industrial application.
2	B	8	Compare Chemical Vapour Deposition and Physical Vapour Deposition.
2	B	9	Why is cladding used in aerospace applications?
2	B	10	Which surface treatment method would you recommend for protecting steel bridges? Why?
2	B	11	Explain how shot peening improves the fatigue life of a component.

UNIT	PART	Q.NO	QUESTION
	B	1	Explain the principle of abrasive jet machining with one application.
3	B	2	Why is water jet machining considered environmentally friendly?
3	B	3	State three advantages of ultrasonic machining.
3	B	4	Compare electrical discharge machining and laser beam machining.
3	B	5	Why is electron beam machining used in micro-machining?
3	B	6	Explain the advantages and disadvantages of plasma arc machining.
3	B	7	Why is electrochemical machining suitable for making complex shapes?
3	B	8	Which process would you select for drilling very small holes in a fuel injector nozzle? Justify.
3	B	9	Explain one real-life application of chemical machining.
3	B	10	Why are unconventional machining processes needed in modern industries?
3	B	11	Distinguish between Abrasive Jet Machining and Ultrasonic Machining with three points.
4	B	1	Explain the construction and working principle of a turning centre.
4	B	2	Explain the construction and working principle of a machining centre.
4	B	3	Why is a coordinate measuring machine important in modern manufacturing?
4	B	4	Explain the difference between absolute and incremental positioning with an example.
4	B	5	State three purposes of G-codes in computer numerical control programming.
4	B	6	Write the step-by-step procedure for homing position in computer numerical control.
4	B	7	Explain work offset setting procedure in computer numerical control.
4	B	8	State the importance of tool offset in computer numerical control machining.
4	B	9	Write a simple computer numerical control turning program using linear interpolation.
4	B	10	Which interpolation method would you use to produce a circular pocket on a milling
4	B	11	Explain circular interpolation (G02 and G03) with the meaning of the I, J and R words, with one example block.

UNIT	PART	Q.NO	QUESTION
5	B	1	Compare subtractive and additive rapid prototyping methods.
5	B	2	Explain stereolithography with one real-life application.
5	B	3	State three advantages of laser sintering.
5	B	4	Explain fused deposition method with an example.
5	B	5	State three applications of three-dimensional printing in the medical field.
5	B	6	Why is rapid tooling useful in product development?
5	B	7	Which rapid prototyping method is most suitable for making dental implants? Why?
5	B	8	Explain the limitations of three-dimensional printing in large-scale manufacturing.
5	B	9	Write three advantages of using rapid prototyping in aerospace industries.
5	B	10	Why is rapid prototyping considered important in modern manufacturing?
5	B	11	List the three main stages of the rapid prototyping process chain, from CAD model to finished part, with one line on each.

PART C

UNIT	PART	Q.NO	QUESTION
1	C	1	Explain the classification of plastics based on structure and properties. Compare thermoplastics and thermosetting plastics with suitable examples and applications.
1	C	2	Explain the properties, characteristics and industrial applications of: (a) Engineering plastics (b) Elastomers (c) Liquid Crystal Polymers (LCP)
1	C	3	With a neat labelled sketch, explain the construction and working of a single screw extruder.Also list its applications.
1	C	4	Select a suitable plastic material and manufacturing process for a plastic water bottle. Explain the reasons for material selection, process selection and advantages of the product.
1	C	5	Explain why injection moulding is preferred for mass production of plastic components.Discuss its advantages, limitations and industrial applications.
1	C	6	Explain calendaring and rotational moulding with neat sketches. State their advantages, limitations and applications.

UNIT	PART	Q.NO	QUESTION
2	C	1	List and explain modern machining processes. Describe their principles, advantages and applications.
2	C	2	Explain the working principle, advantages and applications of: (a) High speed machining (b) Hot machining
2	C	3	Explain the working principle, tools used, advantages and applications of honing, lapping and burnishing.
2	C	4	Select a suitable surface treatment process for a marine steel shaft. Explain the problem,selected method, working principle, advantages and applications.
2	C	5	Explain the need for super finishing processes after conventional machining. Discuss its effects on surface quality, life and performance of components.
2	C	6	Explain the working principle, types and applications of Chemical Vapour Deposition (CVD) and Physical Vapour Deposition (PVD) with neat sketches.
3	C	1	Classify unconventional machining processes. Explain any four with principles and applications.
3	C	2	With a neat sketch, explain the construction, working principle, advantages and applications of EDM.
3	C	3	Explain the working principle, advantages and applications of: (a) Abrasive Jet Machining (AJM) (b) Ultrasonic Machining (USM).
3	C	4	Select a suitable unconventional machining process for hard and brittle materials. Explain the selection, working principle and advantages.
3	C	5	Explain why unconventional machining processes are widely used in aerospace and medical industries.
3	C	6	Explain Electron Beam Machining (EBM) and Laser Beam Machining (LBM) with neat sketches. Compare the two processes.
4	C	1	Define CNC. Explain the working principle, advantages and industrial applications of CNC machines.
4	C	2	With a neat sketch, explain the construction and working of a CNC turning centre.
4	C	3	Explain Cartesian coordinate system, absolute and incremental programming with suitable examples.
4	C	4	Write a CNC turning program for a simple stepped shaft using linear interpolation. Explain each block.

UNIT	PART	Q.NO	QUESTION
4	C	5	Explain why CNC machines are preferred over conventional machines in modern manufacturing industries.
4	C	6	Explain the construction and working principle of a Coordinate Measuring Machine (CMM) with a neat sketch. State its applications.
5	C	1	Define rapid prototyping. Explain its classification, advantages and applications.
5	C	2	With a neat sketch, explain the working principle, advantages and applications of Fused Deposition Modelling (FDM).
5	C	3	With a neat sketch, explain the working principle, advantages and applications of Stereolithography (SLA).
5	C	4	Select a suitable rapid prototyping method to manufacture a prototype of a mobile phone case.Explain the reasons for selection and process steps.
5	C	5	Explain the importance of rapid prototyping in product development industries.
5	C	6	Explain 3D printing (binder jetting) with a neat sketch. State its working principle, applications and limitations.