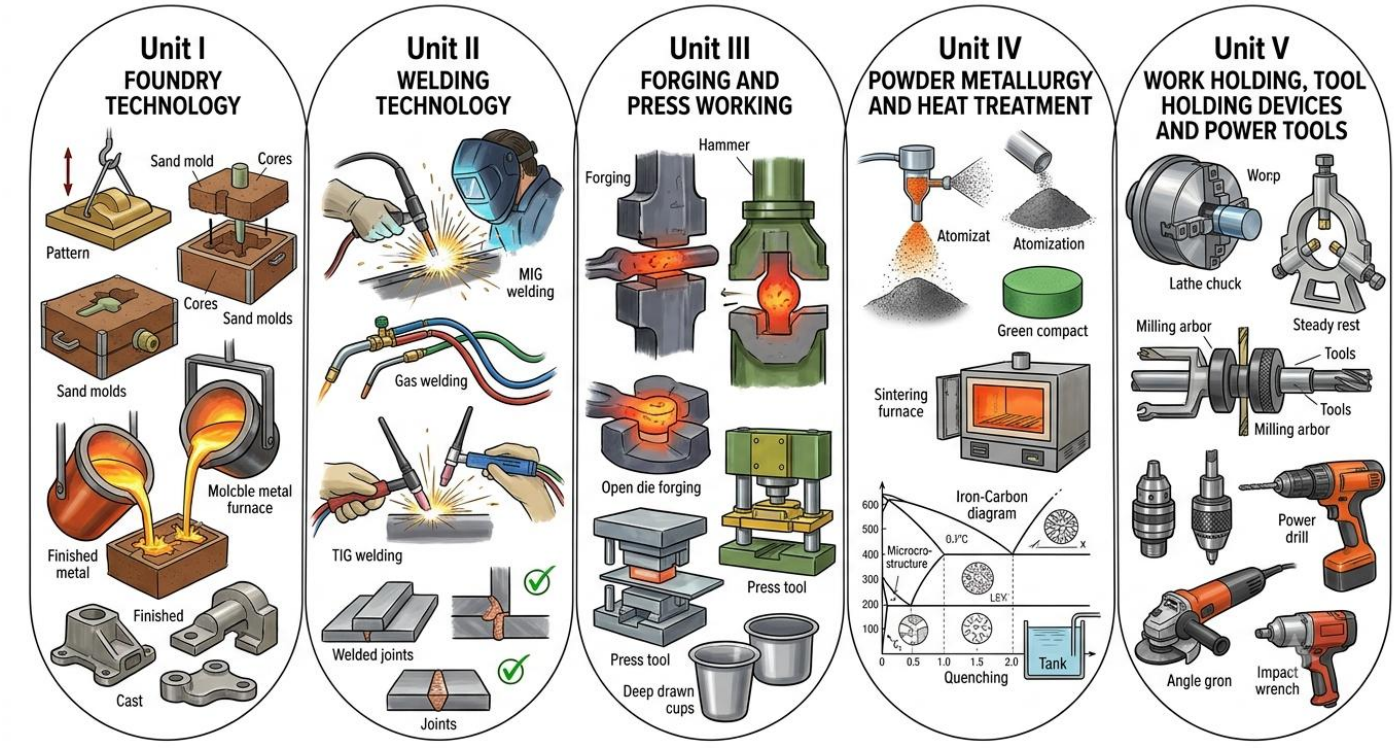
CENTRAL POLYTECHNIC COLLEGE,THARAMANI – 600113.

(An Autonomous Institution)

DEPARTMENT OF MECHANICAL ENGINEERING

QUESTION BANK

EME31010 - MANUFACTURING PROCESS



Unit I	**FOUNDRY TECHNOLOGY**

Chapter 1.1: Foundry: Pattern – Pattern Materials – types – single piece (solid) and split type only – allowances – moulding – moulding tools and

boxes – moulding sands – classifications and properties-core - CO2core making.

Melting of cast iron - cupola furnace - Melting of nonferrous metals - crucible furnace melting of steel – Electric arc furnaces.

Chapter 1.2: Casting: Definition - sand casting using green sand and dry sand - gravity die casting - pressure die casting - hot and cold chamber processes - centrifugal casting - continuous casting– defects in casting - causes and remedies -cleaning of casting and safety practices in foundry

Unit II	**WELDING TECHNOLOGY**

Chapter 2.1: Arc Welding and Gas welding: - Arc welding definition – arc welding equipment – arc welding methods – Carbon arc, metal arc, metal inert gas (MIG), tungsten inert gas (TIG).

Gas Welding: Definition - Gas Welding Equipment - Oxy and acetylene welding - Three types of flame.

Chapter 2.2: Resistance welding and welding related processes: Resistance welding – definition – classification of resistance welding – butt – spot –seam -projection welding - welding related processes - oxy and acetylene cutting - arc cutting - hard facing - bronze welding - soldering and brazing.

Destructive and nondestructive types of tests - magnetic particle test – Die Penetrant test - radiographic and ultrasonic test - defects in welding - causes and remedies - safety practices in welding.

Unit III	**FORGING AND PRESS WORKING**

FORGING AND PRESS WORKING

Chapter 3.1: Forging: Hot working, advantages of hot working – hot working operations – rolling – forging – hammer or smith forging, drop forging, upset forging, press forging – roll forging

Chapter 3.2: Press Working: Types of presses – mechanical and hydraulic presses – press tools and accessories – press working operations– bending operations – angle bending – channel bending – curling –drawing – shearing operations – blanking – piercing – trimming – notching –lancing – shaving – parting off

Unit IV	**POWDER METALLURGY AND HEAT TREATMENT**

Chapter 4.1: Powder Metallurgy: Methods of manufacturing metal powders – atomization, reduction and electrolysis deposition – compacting –sintering – sizing – infiltration – mechanical properties of parts made by powder metallurgy – design rule for the powder metallurgy process.

Chapter 4.2: Heat Treatment: Purpose – procedures – applications of various heat treatment process – Iron carbon equilibrium diagram Annealing – Normalizing – hardening – tempering –quenching medium – different types of quenching medium.

UNIT V	**WORK HOLDING, TOOL HOLDING DEVICES AND POWER TOOLS**

Chapter 5.1: Work Holding Devices: Chucks - Centres - Steady Rest - Follower rest - Face Plate - Catch Plate - Drive plate - carrier - Mandrel - Machine Vice - V block - T Bolts and Clamp - Angle plate - Indexing head - Description and uses.

Tool Holding Devices: Four way tool post - Turret indexing - Arbors - Adapter - Drill chuck - Sleeve - Socket - collet. Description and uses.

Chapter 5.2: Power Tools: Classification - Hand drill- Hammer Drills- Angle Grinder - impact wrench - Circular saw - Chain saw - Jigsaw - Power/impact screwdrivers - Electrical Screwdrivers. Cutters: Craftsman cutter - Reciprocating cutter.

U.NO	Q NO	QUESTIONS
1	1	A pattern in foundry process refers to (a) a foundry tool (b) a moulding process (c) the model of casting (d) a method of casting **Ans:(c) the model of casting**
1	2	The taper provided for easy removal of pattern is called (a) camber allowance (b) draft allowance (c) distortion allowance (d) pattern allowance **Ans:(b) draft allowance**
1	3	The most commonly used material for patterns is (a) Metal (b) Plastic (c) Wax (d) Wood **Ans:(d) Wood**
1	4	Shrinkage allowance is given to (a) Compensate for contraction (b) Provide draft (c) Improve surface finish (d) Facilitate machining **Ans:(a) Compensate for contraction**
1	5	The lower part of moulding box is called (a) cope (b) drag (c) snap (d) cheek **Ans:(b) drag**
1	6	Which sand property allows gases to escape during pouring? (a) Permeability (b) Refractoriness (c) Cohesiveness (d) Collapsibility **Ans:(a) Permeability**
1	7	Cores are used to (a) make hollow or a hole in a casting (b) strengthen moulding sand (c) support loose pieces (d) remove pattern easily **Ans:(a) make hollow or a hole in a casting**
1	8	The binder used in CO_2 core making is (a) Clay (b) Sodium silicate (c) Molasses (d) Bentonite **Ans:(b) Sodium silicate**
1	9	The fuel used in a cupola furnace is (a) Gas (b) Oil (c) Coke (d) Coal **Ans:(c) Coke**
1	10	Electric arc furnaces are commonly used for melting (a) Aluminium (b) Brass (c) Steel (d) Zinc **Ans:(c) Steel**

U.NO	Q NO	QUESTIONS
1	11	The main function of flux in cupola is to (a) Act as fuel (b) Remove impurities (c) Increase melting temperature (d) Harden the metal **Ans:(b) Remove impurities**
1	12	Crucible furnace is mainly used for melting (a) Cast iron (b) Steel (c) Non-ferrous metals (d) Pig iron **Ans:(c) Non-ferrous metals**
1	13	Parting sand is used to (a) Improve surface finish (b) Prevent sticking of mould boxes (c) Strengthen cores (d) Harden the mould **Ans:(b) Prevent sticking of mould boxes**
1	14	Molten iron in cupola is taken out through the (a) Top hole (b) Tap hole (c) Blower (d) Tuyere **Ans:(b) Tap hole**
1	15	Green sand is called so because (a) It is green in colour (b) It contains moisture (c) It is made from plants (d) It is eco-friendly **Ans:(b) It contains moisture**
1	16	The use of dowel pin in moulding is (a) to support loose pieces (b) to remove pattern easily (c) to fit two parts of split pattern correctly (d) None of the above **Ans:(c) to fit two parts of split pattern correctly**
1	17	Lifter is a (a) metal blade fitted with a wooden handle (b) long steel plate with a twisted and bent end (c) wood or metal piece with straight edges (d) cone shaped wooden piece **Ans:(b) long steel plate with a twisted and bent end**
1	18	Vents in moulding are provided for (a) Shrinkage (b) Gas escape (c) Rigidity (d) Core removal **Ans:(b) Gas escape**
1	19	Which type of pattern is made in two halves for easy withdrawal from the mould? (a) Single piece pattern (b) Gated pattern (c) Split type pattern (d) Match plate pattern **Ans:(c) Split type pattern**
1	20	Which tool is used for compacting the moulding sand? (a) Trowel (b) Slick (c) Rammer (d) Lifter **Ans:(c) Rammer**

U.NO	Q NO	QUESTIONS
1	21	Ability of moulding sand to withstand high temperature is called (a) Porosity (b) Strength (c) Adhesiveness (d) Refractoriness **Ans:(d) Refractoriness**
1	22	A solid pattern is also known as a (a) Split pattern (b) Single piece pattern (c) Gated pattern (d) Loose piece pattern **Ans:(b) Single piece pattern**
1	23	Function of riser is to (a) create hollow section (b) act as metal reservoir (c) help remove pattern (d) vent mould gases **Ans:(b) act as metal reservoir**
1	24	Tool used for smoothing mould surfaces (a) Rammer (b) Vent rod (c) Trowel (d) Draw spike **Ans:(c) Trowel**
1	25	Mould part through which molten metal is poured (a) Riser (b) Gate (c) Sprue (d) Runner **Ans:(c) Sprue**
1	26	Casting method for cylindrical, symmetrical castings (a) gravity die casting (b) centrifugal casting (c) continuous casting (d) sand casting **Ans:(b) centrifugal casting**
1	27	Sand casting is used mainly because of (a) Low cost (b) High speed (c) Precision (d) Shiny surface **Ans:(a) Low cost**
1	28	Dry sand casting differs from green sand casting because (a) It uses wax (b) Sand is heated/dried (c) No pattern (d) Metal is cold **Ans:(b) Sand is heated/dried**
1	29	In gravity die casting, metal is poured (a) With vacuum (b) Under pressure (c) Using gravity (d) Centrifugal force **Ans:(c) Using gravity**
1	30	Best method for casting long steel billets without joints (a) Centrifugal casting (b) Gravity die casting (c) Sand casting (d) Continuous casting **Ans:(d) Continuous casting**

U.NO	Q NO	QUESTIONS
1	31	Which is a common cause of casting defects? (a) Correct pouring temperature (b) Proper mould design (c) Improper venting (d) Clean molten metal **Ans:(c) Improper venting**
1	32	The ratio of iron to coke in cupola furnace is (a) 35:1 (b) 10:1 (c) 25:1 (d) 2:1 **Ans:(b) 10:1**
1	33	Pouring molten metal into mould to produce object is called (a) Welding (b) Forging (c) Casting (d) Rolling **Ans:(c) Casting**
1	34	In pressure die casting, molten metal is forced (a) By gravity (b) By vacuum (c) Under pressure (d) Centrifugal force **Ans:(c) Under pressure**
1	35	Die casting process with melting pot in machine is (a) Cold chamber process (b) Hot chamber process (c) Gravity process (d) Vacuum process **Ans:(b) Hot chamber process**
1	36	Casting process using centrifugal force is (a) Die casting (b) Investment casting (c) Centrifugal casting (d) Continuous casting **Ans:(c) Centrifugal casting**
1	37	Which furnace uses high frequency currents ? (a) Crucible Furnace (b) Cupola Furnace (c) Electric arc furnace (d) Induction furnace **Ans:(d) Induction furnace**
1	38	Tumbling is a (a) machining process (b) casting process (c) cleaning process (d) heat treatment **Ans:(c) cleaning process**
1	39	Casting defect from incomplete filling is (a) hot tears (b) shifts (c) cold shuts (d) run out **Ans:(c) cold shuts**
1	40	Blowhole in casting is caused by (a) Cold metal (b) Gases trapped (c) High temperature (d) Core shifting **Ans:(b) Gases trapped**

U.NO	Q NO	QUESTIONS
1	41	Misalignment of cope and drag defect is (a) Swell (b) Shift (c) Drop (d) Scab **Ans:(b) Shift**
1	42	Inclusion defect is caused by (a) Pure metal (b) Solidification delay (c) Foreign particles (d) High pressure **Ans:(c) Foreign particles**
1	43	Which is Not a casting defect? (a) Misrun (b) Shrinkage cavity (c) Riser (d) Blowhole **Ans:(c) Riser**
1	44	Method for cleaning castings (a) Painting (b) Welding (c) Shot blasting (d) Anodizing **Ans:(c) Shot blasting**
1	45	Safety goggles protect against (a) Loud noise (b) Harmful gases (c) Metal splashes (d) High temperature **Ans:(c) Metal splashes**
1	46	Remedy for blowholes (a) Using dry sand (b) Proper venting (c) Overheating metal (d) Increasing sand hardness **Ans:(b) Proper venting**
1	47	PPE in foundry includes (a) Goggles (b) Gloves (c) Apron (d) All of the above **Ans:(d) All of the above**
1	48	Hot chamber process is suitable for (a) High melting point metals (b) Ferrous metals (c) Low melting point metals (d) Steel **Ans:(c) Low melting point metals**
1	49	Upper part of moulding box is called (a) Drag (b) Cope (c) Flask (d) Rammer **Ans:(b) Cope**
1	50	Cupola furnace lining is made of (a) Graphite (b) Refractory bricks (c) Steel (d) Limestone **Ans:(b) Refractory bricks**

U.NO	Q NO	QUESTIONS
1	51	A cast iron component is found undersized after solidification. Which pattern modification would have prevented this defect? (a) Increase draft allowance (b) Increase shrinkage allowance (c) Increase machining allowance (d) Increase distortion allowance **Ans:(B) Increase shrinkage allowance**
1	52	A steel casting requires precise composition control and high melting temperature. Which furnace is the best choice? (a) Cupola furnace (b) Crucible furnace (c) Electric arc furnace (d) Reverberatory furnace **Ans:(C) Electric arc furnace**
1	53	Hot chamber die casting cannot be used for aluminium alloys mainly because aluminium has (a) High melting temperature (b) Low fluidity (c) High density (d) Low shrinkage **Ans:(A) High melting temperature**
1	54	A foundry changes from wooden patterns to metal patterns. Which outcome is most likely for mass production? (a) Lower dimensional accuracy (b) Better accuracy and longer pattern life (c) Increased moisture absorption (d) Reduced pattern cost **Ans:(B) Better accuracy and longer pattern life**
1	55	A non-ferrous alloy is contaminated by furnace gases. Which melting equipment would minimize contamination? (a) Cupola furnace (b) Electric arc furnace (c) Crucible furnace (d) Blast furnace **Ans:(C) Crucible furnace**
2	1	The source of heat in arc welding is: (a) Gas torch (b) Electric arc (c) Induction (d) Plasma **Ans:(b) Electric arc**
2	2	In MIG welding, the electrode is: (a) Non-consumable (b) Tungsten (c) Consumable wire (d) Coated rod **Ans:(c) Consumable wire**
2	3	TIG welding uses which type of electrode? (a) Copper (b) Carbon (c) Tungsten (d) Mild steel **Ans:(c) Tungsten**
2	4	The shielding gas used in TIG welding is often: (a) Hydrogen (b) Acetylene (c) Oxygen (d) Argon **Ans:(d) Argon**
2	5	Which arc welding method is best for thin metals? (a) Carbon arc (b) SMAW (c) TIG (d) MIG **Ans:(c) TIG**

U.NO	Q NO	QUESTIONS
2	6	Gas welding uses fuel gas combined with: (a) Hydrogen (b) Argon (c) Oxygen (d) Nitrogen **Ans:(c) Oxygen**
2	7	Which component controls gas pressure in a gas welding setup? (a) Torch (b) Hose (c) Regulator (d) Cylinder **Ans:(c) Regulator**
2	8	The hottest flame in oxy-acetylene welding is: (a) Carburizing (b) Neutral (c) Oxidizing (d) Incomplete **Ans:(c) Oxidizing**
2	9	Which flame has excess acetylene? (a) Oxidizing (b) Neutral (c) Carburizing (d) Plasma **Ans:(c) Carburizing**
2	10	The tungsten electrode in TIG welding is: (a) Consumable (b) Melts during welding (c) Non-consumable (d) Used for cutting **Ans:(c) Non-consumable**
2	11	Purpose of shielding gas in TIG/MIG welding is to: (a) Cool the weld (b) Increase arc temperature (c) Protect weld from oxidation (d) Clean the surface **Ans:(c) Protect weld from oxidation**
2	12	What is welding? (a) Cutting metal (b) Joining materials by coalescence (c) Bending metal (d) Cleaning metal **Ans:(b) Joining materials by coalescence**
2	13	Which fuel gas is most commonly used with oxygen for gas welding? (a) Propane (b) Hydrogen (c) Acetylene (d) Methane **Ans:(c) Acetylene**
2	14	A flame with excess oxygen is called: (a) Neutral flame (b) Oxidizing flame (c) Carburizing flame (d) Normal flame **Ans:(b) Oxidizing flame**
2	15	Flame with equal oxygen and acetylene used for most welding: (a) Oxidizing flame (b) Carburizing flame (c) Neutral flame (d) Excess fuel flame **Ans:(c) Neutral flame**

U.NO	Q NO	QUESTIONS
2	16	Colour of acetylene hoses: (a) Green (b) Blue (c) Black (d) Red **Ans:(d) Red**
2	17	Temperature of oxy-acetylene flame is around (a) 1000°C (b) 2000°C (c) 3200°C (d) 5000°C **Ans:(c) 3200°C**
2	18	Which gas is inert and used for shielding in welding? (a) Oxygen (b) Hydrogen (c) Argon or Helium (d) Acetylene **Ans:(c) Argon or Helium**
2	19	Main purpose of a flux in welding: (a) Add metal (b) Prevent oxidation (c) Increase arc temp (d) Cool weld quickly **Ans:(b) Prevent oxidation**
2	20	Which is an arc welding method? (a) Oxy-acetylene (b) Forge welding (c) MIG welding (d) Resistance welding **Ans:(c) MIG welding**
2	21	Welding method using a continuous wire electrode? (a) MIG welding (b) TIG welding (c) Carbon Arc (d) SMAW **Ans:(a) MIG welding**
2	22	Arc welding generally requires: (a) Oxygen cylinders (b) Power source with current (c) Fuel gas (d) Chemical flux **Ans:(b) Power source with current**
2	23	Part that mixes oxygen and acetylene gases? (a) Control valve (b) Welding torch (c) Pressure regulator (d) Hose **Ans:(b) Welding torch**
2	24	In arc welding, arc is struck between work and: (a) Transformer (b) Electrode (c) Welding table (d) Gas nozzle **Ans:(b) Electrode**
2	25	Arc length is the distance between: (a) Two electrodes (b) Electrode and work (c) Two grounding cables (d) Workpiece and ground **Ans:(b) Electrode and work**

U.NO	Q NO	QUESTIONS
2	26	Applying hard, wear-resistant layer to a surface is: (a) Soldering (b) Brazing (c) Hardfacing (d) Annealing **Ans:(c) Hardfacing**
2	27	Type of resistance welding: (a) TIG welding (b) Spot welding (c) Gas welding (d) Arc cutting **Ans:(b) Spot welding**
2	28	In spot welding, weld is formed at: (a) Entire joint length (b) Individual spots (c) Corners only (d) Center only **Ans:(b) Individual spots**
2	29	Seam welding creates: (a) Single spot weld (b) Continuous joint (c) Butt joint (d) T-joint **Ans:(b) Continuous joint**
2	30	Heat concentration point in projection welding: (a) Electrode tips (b) Entire surface (c) embossments (d) Away from joint **Ans:(c) embossments**
2	31	Cutting metals with oxy-fuel flame: (a) Arc cutting (b) Plasma cutting (c) Oxy-acetylene cutting (d) Laser cutting **Ans:(c) Oxy-acetylene cutting**
2	32	Resistance welding generates heat by: (a) Friction (b) Chemical reaction (c) Electrical resistance at joint (d) Sunlight **Ans:(c) Electrical resistance at joint**
2	33	Spot welding is mainly used for: (a) Thin sheets (b) Thick rods (c) Heavy castings (d) Brick walls **Ans:(a) Thin sheets**
2	34	Seam welding electrodes are: (a) Spheres (b) Flat plates (c) Rotating wheels (d) Tubes **Ans:(c) Rotating wheels**
2	35	Welding process which is not resistance welding type is (a) Spot welding (b) Flash butt welding (c) TIG welding (d) Projection welding **Ans:(c) TIG welding**

U.NO	Q NO	QUESTIONS
2	36	Electrodes in resistance welding are made of: (a) Aluminum (b) Copper alloys (c) Steel (d) Brass **Ans:(b) Copper alloys**
2	37	Soldering uses filler with melting point: (a) Below 450°C (b) 800°C (c) Above 1000°C (d) Same as base **Ans:(a) Below 450°C**
2	38	Bronze welding is also called as (a) MIG welding (b) Braze welding (c) Seam welding (d) TIG welding **Ans:(b) Braze welding**
2	39	Non-destructive testing means: (a) Breaking apart (b) No damage to sample (c) Painting (d) High temp test **Ans:(b) No damage to sample**
2	40	Magnetic particle test detects: (a) Surface & near-surface cracks (b) Internal defects only (c) Rust only (d) Thickness only **Ans:(a) Surface & near-surface cracks**
2	41	Radiographic test uses: (a) Magnetic fields (b) X-rays or gamma rays (c) Water jets (d) Compressed air **Ans:(b) X-rays or gamma rays**
2	42	Ultrasonic test detects defects by: (a) Sound wave reflections (b) Spark color (c) Temperature changes (d) Gas evolution **Ans:(a) Sound wave reflections**
2	43	Radiography test is effective for: (a) Surface cracks (b) Internal flaws (c) Color checks only (d) **Ans:(b) Internal flaws**
2	44	Carbon arc welding uses (a) Gas torch (b) Copper electrode (c) Carbon electrode (d) Tungsten electrode **Ans:(c) Carbon electrode**
2	45	Slag inclusion is minimized by: (a) Increasing current (b) Cleaning between passes (c) Fast movement (d) Cooling rapidly **Ans:(b) Cleaning between passes**

U.NO	Q NO	QUESTIONS
2	46	To avoid electrical shock in welding: (a) Use dry gloves & good cables (b) Work barefoot (c) use wet floor (d) Use wet gloves **Ans:(a) Use dry gloves & good cables**
2	47	Internal voids in welding is best detected by: (a) Radiographic testing (b) Visual (c) Magnetic particle (d) Dye penetrant **Ans:(a) Radiographic testing**
2	48	Porosity in weld is often caused by: (a) Clean base (b) Correct arc length (c) Contamination/moisture (d) Proper shielding gas **Ans:(c) Contamination/moisture**
2	49	Cracks in weld is caused by: (a) Rapid cooling (b) Strong shielding (c) High humidity (d) Thick electrodes **Ans:(a) Rapid cooling**
2	50	Which is Not a resistance welding process? (a) Butt welding (b) Seam welding (c) Forge welding (d) Projection welding **Ans:(c) Forge welding**
2	51	A fabrication shop needs to weld thin stainless-steel sheets where minimum distortion and excellent weld quality are required. Which process is most appropriate? (a) Carbon arc welding (b) Oxy-acetylene welding (c) Butt welding (d) TIG welding **Ans:(D) TIG welding**
2	52	A welder must join mild-steel plates using oxy-acetylene welding without excessive oxidation or carbon deposition. Which flame should be selected? (a) Neutral flame (b) Oxidizing flame (c) Carburizing flame (d) Oxygen-only flame **Ans:(A) Neutral flame**
2	53	A resistance welding machine is required to join overlapping thin sheets at individual locations with high production rate. Which process should be selected? (a) Butt welding (b) Seam welding (c) Spot welding (d) Projection welding **Ans:(C) Spot welding**
2	54	A workshop must cut a thick mild-steel plate economically using a process based on rapid oxidation of the metal. Which process is most suitable? (a) TIG welding (b) Seam welding (c) Soldering (d) Oxy-acetylene cutting **Ans:(D) Oxy-acetylene cutting**
2	55	Radiographic inspection of a weld shows many small rounded dark indications. Which defect is most likely? (a) Undercut (b) Lack of fusion (c) Porosity (d) Overlap **Ans:(C) Porosity**

U.NO	Q NO	QUESTIONS
3	1	What is the primary purpose of forging? (a) Machining metals (b) Heating and casting metals (c) Shaping metal using compressive forces (d) Welding metals **Ans:(c) Shaping metal using compressive forces**
3	2	Hot working is generally performed at (a) Below room temperature (b) Just above room temperature (c) Above recrystallization temperature (d) At freezing point **Ans:(c) Above recrystallization temperature**
3	3	Which forging method uses repeated blows? (a) Drop forging (b) Press forging (c) Upset forging (d) Roll forging **Ans:(a) Drop forging**
3	4	What is a key advantage of hot working? (a) Produces better surface finish (b) Increases hardness (c) Refines grain structure (d) Requires no heating **Ans:(c) Refines grain structure**
3	5	In which operation , cross section increases at selected location? (a) Drop forging (b) Upset forging (c) Roll forging (d) Press forging **Ans:(b) Upset forging**
3	6	What is the function of a die in press working? (a) To cut sheet metal (b) To provide shape to the metal (c) To support the press (d) To apply pressure **Ans:(b) To provide shape to the metal**
3	7	Which operation is used to produce holes in sheet metal? (a) Blanking (b) Piercing (c) Notching (d) Lancing **Ans:(b) Piercing**
3	8	Which operation forms a cup-like shape from sheet metal? (a) Bending (b) Curling (c) Drawing (d) Piercing **Ans:(c) Drawing**
3	9	What is the function of a punch in press tools? (a) To move the die (b) To clamp the sheet (c) To force the material into the die (d) To measure the material **Ans:(c) To force the material into the die**
3	10	Which of the following operations increases length and reduces cross-section? (a) Bending (b) Drawing (c) Upsetting (d) Forging **Ans:(b) Drawing**

U.NO	Q NO	QUESTIONS
3	11	What kind of press uses crankshaft or eccentric? (a) Hydraulic press (b) Pneumatic press (c) Mechanical press (d) Toggle press **Ans:(c) Mechanical press**
3	12	Curling in press working is done to: (a) Cut the sheet metal (b) Make holes (c) Create circular edges (d) Weld sheets **Ans:(c) Create circular edges**
3	13	Why is hot working more suitable than cold working for large deformations? (a) It is cheaper (b) Requires less force and avoids strain hardening (c) Has better surface finish (d) Does not need heating **Ans:(b) Requires less force and avoids strain hardening**
3	14	How does press forging differ from hammer forging? (a) Press forging uses intermittent blows (b) Hammer forging uses slow pressure (c) Press forging uses continuous pressure (d) Hammer forging uses hydraulic pressure **Ans:(c) Press forging uses continuous pressure**
3	15	Which process do not have cutting action? (a) Piercing (b) Bending (c) Blanking (d) Shaving **Ans:(b) Bending**
3	16	What is the output of the drawing operation? (a) Flat sheet (b) Cup or box shape (c) Hole (d) Notch **Ans:(b) Cup or box shape**
3	17	Which forging method uses rotating rolls with shaped grooves? (a) Drop forging (b) Press forging (c) Upset forging (d) Roll forging **Ans:(d) Roll forging**
3	18	Which of the following is a shearing operation? (a) Drawing (b) Bending (c) Curling (d) Parting off **Ans:(d) Parting off**
3	19	In which operation is material removed from sheet edge to produce a shape? (a) Curling (b) Notching (c) Trimming (d) Lancing **Ans:(b) Notching**
3	20	Which component holds and guides the punch in a press? (a) Die block (b) Ram (c) Stripper plate (d) Press frame **Ans:(b) Ram**

U.NO	Q NO	QUESTIONS
3	21	Why is trimming done after drawing? (a) To reduce thickness (b) To clean the surface (c) To remove excess flange material (d) To smoothen the inside **Ans:(c) To remove excess flange material**
3	22	How does the metal behave during hot working? (a) Brittle and hard (b) Soft and ductile (c) Rigid and tough (d) Cold and fragile **Ans:(b) Soft and ductile**
3	23	In forging, which factor primarily determines the quality of the part? (a) Paint finish (b) Material color (c) Grain flow (d) Cooling rate **Ans:(c) Grain flow**
3	24	Which operation creates a smooth, finished edge on a punched part? (a) Notching (b) Curling (c) Shaving (d) Drawing **Ans:(c) Shaving**
3	25	Channel bending produces (a) V shapes (b) U shapes (c) L shapes (d) Holes **Ans:(b) U shapes**
3	26	What type of press is preferred for slow, heavy-force operations? (a) Mechanical (b) Hydraulic (c) Pneumatic (d) Manual **Ans:(b) Hydraulic**
3	27	What is the output product called in a blanking operation? (a) Scrap (b) Notch (c) Blank (d) Burr **Ans:(c) Blank**
3	28	What is typically used to make a cylindrical cup from flat sheet metal? (a) Curling die (b) Punch and drawing die (c) Trimming tool (d) Blanking die **Ans:(b) Punch and drawing die**
3	29	Why is hot working beneficial for large reductions in cross-section? (a) Prevents grain refinement (b) Avoids cracking (c) Reduces color change (d) Improves corrosion **Ans:(b) Avoids cracking**
3	30	Which operation creates a partial cut and forms a tab in sheet metal? (a) Lancing (b) Curling (c) Notching (d) Blanking **Ans:(a) Lancing**

U.NO	Q NO	QUESTIONS
3	31	What is the tool that makes the actual cut in a press tool? (a) Die (b) Ram (c) Punch (d) Stripper **Ans:(c) Punch**
3	32	In a mechanical press, what stores and delivers energy for pressing? (a) Gearbox (b) Flywheel (c) Crankshaft (d) Piston **Ans:(b) Flywheel**
3	33	Press accessories used to locate the hole which is already pierced in the blank is (a) Stops (b) Strippers (c) Knockouts (d) Pilots **Ans:(d) Pilots**
3	34	The function of a stripper plate in press tools is to: (a) Align the punch (b) Support the die (c) Remove the workpiece from the punch (d) Increase pressure **Ans:(c) Remove the workpiece from the punch**
3	35	The operation involving rotating rollers with grooves to shape metal is: (a) Smith forging (b) Upset forging (c) Roll forging (d) Die forging **Ans:(c) Roll forging**
3	36	What is the main purpose of rolling in hot working? (a) To shape metal by casting (b) To reduce thickness of metal (c) To weld metal sheets (d) To cut metals **Ans:(b) To reduce thickness of metal**
3	37	In forging, the excess squeezed out metal is called: (a) Flash (b) Scale (c) Burr (d) Chip **Ans:(a) Flash**
3	38	Forging is mostly done at: (a) Room temperature only (b) Either hot or cold depending on metal (c) Below melting point but above boiling point (d) Cryogenic temperatures **Ans:(b) Either hot or cold depending on metal**
3	39	Which of the following is NOT a hot working operation? (a) Rolling (b) Smith forging (c) Annealing (d) Upset forging **Ans:(c) Annealing**
3	40	Which forging process is best for producing large parts? (a) Open-die forging (b) Drop forging (c) Upset forging (d) Roll forging **Ans:(a) Open-die forging**

U.NO	Q NO	QUESTIONS
3	41	Which forging operation is most suitable for making heads on bolts? (a) Upset forging (b) Drop forging (c) Roll forging (d) Press forging **Ans:(a) Upset forging**
3	42	Upset forging is also called as (a) Drop forging (b) Press forging (c) Machine forging (d) Roll forging **Ans:(c) Machine forging**
3	43	During forging, the metal flow is restricted by: (a) The die cavity shape (b) The temperature only (c) Hammer blows only (d) Cooling rate **Ans:(a) The die cavity shape**
3	44	The main difference between drop forging and press forging is: (a) Impact force versus continuous pressure (b) Temperature used (c) Type of metal (d) Size of parts produced **Ans:(a) Impact force versus continuous pressure**
3	45	Blanking is performed to (a) Produce holes inside the part (b) Produce the required outer shape of the part (c) Draw the sheet into a die cavity (d) Bend the sheet **Ans:(b) Produce the required outer shape of the part**
3	46	The typical source of power for a mechanical press is: (a) Steam engine (b) Electric motor with flywheel and crank (c) Manual lever (d) Hydraulic cylinder **Ans:(b) Electric motor with flywheel and crank**
3	47	In forging, the grain flow of metal : (a) Random (b) Follows the shape of part (c) Destroyed (d) Same as casting **Ans:(b) Follows the shape of part**
3	48	Blanking and piercing differ mainly in: (a) Shape of the punch (b) Whether cut piece or sheet is desired product (c) Press operation speed (d) Tool material **Ans:(b) Whether cut piece or sheet is desired product**
3	49	Which forging type uses hydraulic press? (a) Drop forging (b) Press forging (c) Smith forging (d) Roll forging **Ans:(b) Press forging**
3	50	In press working, clearance is: (a) Space between punch and die to shear metal (b) Air gap in hydraulic system (c) Space for operator (d) None of the above **Ans:(a) Space between punch and die to shear metal**

U.NO	Q NO	QUESTIONS
3	51	A component is required to have improved mechanical properties and a refined grain structure compared with the original cast material. Which process should be preferred? (a) Piercing (b) Blanking (c) Hot forging (d) Shearing **Ans:(C) Hot forging**
3	52	A press-working operation involves a deep drawing process requiring controlled force throughout a relatively long stroke. Which press is more suitable? (a) Smith forging hammer (b) Mechanical press only (c) Hydraulic press (d) Drop hammer **Ans:(C) Hydraulic press**
3	53	A sheet-metal strip must be formed into a U-shape long its length. Which operation is most appropriate? (a) Curling (b) Channel bending (c) Blanking (d) Notching **Ans:(B) Channel bending**
3	54	A circular hole must be produced in a sheet while the removed slug is treated as scrap. Which operation is appropriate? (a) Piercing (b) Blanking (c) Shaving (d) Curling **Ans:(A) Piercing**
3	55	A steel billet is difficult to deform at room temperature and requires very high force. The manufacturer wants to reduce the required force .Which approach is most suitable? (a) Piercing (b) Hot working (c) Shaving (d) Cold working **Ans:(B) Hot working**
4	1	What is the first step in powder metallurgy? (a) Sintering (b) Compaction (c) Powder production (d) Sizing **Ans:(c) Powder production**
4	2	Atomization is used to produce metal powders by: (a) Grinding metal pieces (b) Heating metal (c) Breaking molten metal into fine droplets (d) Solidifying metal blocks **Ans:(c) Breaking molten metal into fine droplets**
4	3	Which process is done after compaction in powder metallurgy? (a) Sintering (b) Electrolysis (c) Infiltration (d) Quenching **Ans:(a) Sintering**
4	4	What is the main characteristic of powder metallurgy parts? (a) High porosity (b) Liquid phase bonding (c) High cost (d) Very heavy **Ans:(a) High porosity**
4	5	Which method uses electrical current to produce metal powder? (a) Reduction (b) Atomization (c) Electrolytic deposition (d) Sizing **Ans:(c) Electrolytic deposition**

U.NO	Q NO	QUESTIONS
4	6	What type of material is most commonly processed in powder metallurgy? (a) Plastics (b) Ceramics (c) Metals (d) Wood **Ans:(c) Metals**
4	7	Sizing is done to: (a) Increase porosity (b) Improve dimensional accuracy (c) Change color (d) Reduce cost **Ans:(b) Improve dimensional accuracy**
4	8	What is the main purpose of infiltration in powder metallurgy? (a) Increase porosity (b) Fill pores to improve strength (c) Reduce powder size (d) Increase melting point **Ans:(b) Fill pores to improve strength**
4	9	Which of the following is a quenching medium? (a) Air (b) Coke (c) Acid (d) Coal **Ans:(a) Air**
4	10	Heat treatment is primarily used to: (a) Color metals (b) Shape metals (c) Improve physical and mechanical properties (d) Remove metal **Ans:(c) Improve physical and mechanical properties**
4	11	The diagram showing phase changes in steel is called: (a) Stress-strain diagram (b) Iron-carbon equilibrium diagram (c) Binary alloy chart (d) Heat transfer graph **Ans:(b) Iron-carbon equilibrium diagram**
4	12	Annealing improves: (a) Brittleness (b) Ductility (c) Porosity (d) Hardness **Ans:(b) Ductility**
4	13	Which process is used to reduce hardness and relieve stress? (a) Tempering (b) Quenching (c) Sintering (d) Cold working **Ans:(a) Tempering**
4	14	What is the purpose of hardening? (a) Make the metal soft (b) Reduce cost (c) Increase hardness (d) Increase corrosion **Ans:(c) Increase hardness**
4	15	What happens during quenching? (a) Metal is cooled rapidly (b) Metal is bent (c) Metal is compacted (d) Metal is sintered **Ans:(a) Metal is cooled rapidly**

U.NO	Q NO	QUESTIONS
4	16	Normalizing produces: (a) Brittle structure (b) Fine and uniform grain structure (c) Porous surface (d) Rough finish **Ans:(b) Fine and uniform grain structure**
4	17	Which structure forms when steel is quenched rapidly? (a) Ferrite (b) Pearlite (c) Martensite (d) Austenite **Ans:(c) Martensite**
4	18	Which of these processes is NOT part of heat treatment? (a) Annealing (b) Tempering (c) Compacting (d) Hardening **Ans:(c) Compacting**
4	19	Which gas is commonly used in the reduction method to produce metal powder? (a) Oxygen (b) Hydrogen (c) Carbon dioxide (d) Nitrogen **Ans:(b) Hydrogen**
4	20	Compacting is carried out: (a) Before sintering (b) After sizing (c) After quenching (d) Before electrolysis **Ans:(a) Before sintering**
4	21	Porosity in powder metallurgy parts is due to: (a) High hardness (b) High temperature (c) Unfused powder particles (d) Water content **Ans:(c) Unfused powder particles**
4	22	Which of the following is not a purpose of heat treatment? (a) To reduce hardness (b) To improve machinability (c) To change color (d) To relieve internal stress **Ans:(c) To change color**
4	23	In powder metallurgy, which factor most affects the final density of the product? (a) Sintering time (b) Powder particle size (c) Cooling medium (d) Surface finish **Ans:(b) Powder particle size**
4	24	Powder metallurgy is best suited for: (a) Large castings (b) Complex, small parts (c) Wood structures (d) Plastic molding **Ans:(b) Complex, small parts**
4	25	What is the main cooling medium mostly used in quenching? (a) Mercury (b) Oil (c) Wood (d) Air only **Ans:(b) Oil**

U.NO	Q NO	QUESTIONS
4	26	The eutectoid composition of steel contains what percentage of carbon? (a) 0.003 (b) 0.006 (c) 0.008 (d) 0.012 **Ans:(c) 0.008**
4	27	Which heat treatment process involves slow cooling in a furnace? (a) Tempering (b) Hardening (c) Annealing (d) Quenching **Ans:(c) Annealing**
4	28	What is the critical temperature for eutectoid transformation in steel? (a) 727°C (b) 912°C (c) 1147°C (d) 1536°C **Ans:(a) 727°C**
4	29	In heat treatment, what is the purpose of soaking period? (a) To cool rapidly (b) To attain uniform temperature (c) To pressurize metal (d) To quench faster **Ans:(b) To attain uniform temperature**
4	30	Which process involves heating metal to a temperature below its melting point to bond particles? (a) Annealing (b) Sintering (c) Hardening (d) Quenching **Ans:(b) Sintering**
4	31	What is the main effect of tempering on hardened steel? (a) Increase hardness (b) Decrease toughness (c) Reduce brittleness (d) Increase porosity **Ans:(c) Reduce brittleness**
4	32	Which powder metallurgy process improves surface finish and dimensional accuracy? (a) Atomization (b) Sintering (c) Sizing (d) Compaction **Ans:(c) Sizing**
4	33	Which quenching medium cools steel most rapidly? (a) Oil (b) Air (c) Water (d) Brine **Ans:(d) Brine**
4	34	Which heat treatment improves machinability by softening metals? (a) Hardening (b) Annealing (c) Tempering (d) Normalizing **Ans:(b) Annealing**
4	35	Which heat treatment process involves heating metal to a high temperature then cooling in still air? (a) Annealing (b) Normalizing (c) Hardening (d) Tempering **Ans:(b) Normalizing**

U.NO	Q NO	QUESTIONS
4	36	Which of these is NOT a step in powder metallurgy? (a) Compaction (b) Sintering (c) Forging (d) Sizing **Ans:(c) Forging**
4	37	Which heat treatment process increases hardness and strength but reduces ductility? (a) Annealing (b) Normalizing (c) Hardening (d) Tempering **Ans:(c) Hardening**
4	38	Which quenching medium cools steel slowest? (a) Water (b) Oil (c) Air (d) Brine **Ans:(c) Air**
4	39	What does sintering temperature depend on? (a) Powder size (b) Melting point of the metal (c) Cooling medium (d) Alloy composition **Ans:(b) Melting point of the metal**
4	40	The pressure applied during compacting affects the (a) Colour (b) Chemical composition (c) Density (d) Melting point **Ans:(c) Density**
4	41	What microstructure forms at eutectoid composition when cooled slowly? (a) Martensite (b) Pearlite (c) Cementite (d) Austenite **Ans:(b) Pearlite**
4	42	Which heat treatment involves heating steel to below the lower critical temperature? (a) Annealing (b) Normalizing (c) Tempering (d) Sintering **Ans:(c) Tempering**
4	43	What is the reason for using vacuum atmosphere during sintering? (a) To increase porosity (b) To prevent oxidation (c) To reduce hardness (d) To cool faster **Ans:(b) To prevent oxidation**
4	44	Which of the following is NOT a common quenching medium? (a) Brine (b) Oil (c) Air (d) Mercury **Ans:(d) Mercury**
4	45	What happens to metal powder during compaction? (a) Particles fuse completely (b) Particles are pressed into a shape (c) Particles melt (d) Particles oxidize **Ans:(b) Particles are pressed into a shape**

U.NO	Q NO	QUESTIONS
4	46	Which heat treatment process is used to remove internal stresses? (a) Quenching (b) Annealing (c) Hardening (d) Austenizing **Ans:(b) Annealing**
4	47	What type of powder metallurgy part design is preferred? (a) With sharp corners (b) With uniform thickness (c) With thin sections only (d) With complex internal threads **Ans:(b) With uniform thickness**
4	48	What is the role of carbon in steel? (a) Increase corrosion resistance (b) Increase hardness and strength (c) Decrease density (d) Improve electrical conductivity **Ans:(b) Increase hardness and strength**
4	49	Which component in iron-carbon diagram has the highest carbon content? (a) Ferrite (b) Pearlite (c) Cementite (d) Austenite **Ans:(c) Cementite**
4	50	The "green compact" has: (a) High strength (b) High density (c) Low strength and is fragile (d) A green color **Ans:(c) Low strength and is fragile**
4	51	Metal powder is to be produced directly from a stream of molten metal and requires control over particle size. Which method should be selected? (a) Sintering (b) Atomization (c) Reduction (d) Electrolysis **Ans:(B) Atomization**
4	52	A metal powder manufacturer starts with a metal oxide and wants to convert it into metallic powder without melting the material. Which process is most suitable? (a) Atomization (b) Sintering (c) Infiltration (d) Reduction **Ans:(D) Reduction**
4	53	To improve the dimensional accuracy of a sintered component without substantially changing its overall shape, which operation should be selected? (a) Atomization (b) Reduction (c) Compacting (d) Sizing **Ans:(D) Sizing**
4	54	A porous Powder Metallurgy component must be made pressure-tight and stronger by filling its interconnected pores with another metal. Which process is most suitable? (a) Sizing (b) Reduction (c) Infiltration (d) Atomization **Ans:(C) Infiltration**
4	55	A steel component is heated to the appropriate temperature and then cooled in still air to obtain a finer structure and higher strength. Which heat treatment is being used? (a) Normalizing (b) Annealing (c) Tempering (d) Sizing **Ans:(A) Normalizing**

U.NO	Q NO	QUESTIONS
5	1	What is the main function of a chuck in machining? (a) Hold the workpiece securely (b) Cut the metal (c) Measure dimensions (d) Heat the workpiece **Ans:(a) Hold the workpiece securely**
5	2	Which device supports a long slender workpiece during machining? (a) Steady Rest (b) Face Plate (c) Mandrel (d) Machine Vice **Ans:(a) Steady Rest**
5	3	A face plate is used for? (a) Holding cutting tools (b) Holding irregular shaped workpieces on a lathe (c) Measuring length (d) Drilling holes **Ans:(b) Holding irregular shaped workpieces on a lathe**
5	4	Catch plates are used to: (a) Prevent workpiece slipping during machining (b) Hold tools (c) Measure surface finish (d) Control machine speed **Ans:(a) Prevent workpiece slipping during machining**
5	5	Which plate is used with carrier to drive workpiece between centres? (a) Face Plate (b) Angle plate (c) Drive plate (d) Surface plate **Ans:(c) Drive plate**
5	6	A V-block is used to: (a) Hold flat surfaces (b) Cut threads (c) Hold cylindrical workpieces (d) Measure length **Ans:(c) Hold cylindrical workpieces**
5	7	Mandrels are primarily used to: (a) Measure diameter (b) Cut threads (c) Hold workpieces with internal diameters (d) Support a drill bit **Ans:(c) Hold workpieces with internal diameters**
5	8	T bolts and clamps are used for: (a) Controlling speed (b) Measuring temperature (c) Adjusting tool height (d) Holding workpieces on a machine table **Ans:(d) Holding workpieces on a machine table**
5	9	Device mounted on carriage moving with the cutting tool to support workpiece is a: (a) Steady Rest (b) Follower rest (c) Live centre (d) Dead centre **Ans:(b) Follower rest**
5	10	Device used to support free end of long workpiece in lathe? (a) Chuck (b) Centre (c) Face plate (d) Mandrel **Ans:(b) Centre**

U.NO	Q NO	QUESTIONS
5	11	Device to transmit drive from drive plate to workpiece? (a) Bolt (b) Mandrel (c) Clamp (d) Dog or Carrier **Ans:(d) Dog or Carrier**
5	12	Cast iron plate with two faces at right angle to support workpieces is: (a) Angle plate (b) Face plate (c) Drive plate (d) V-block **Ans:(a) Angle plate**
5	13	Device used to divide periphery of workpiece into equal divisions? (a) Tailstock (b) Indexing head (c) Chuck (d) Vice **Ans:(b) Indexing head**
5	14	Shaft used for mounting and driving milling cutter is an: (a) Mandrel (b) Arbor (c) Sleeve (d) Socket **Ans:(b) Arbor**
5	15	Device used to connect tool shank to machine spindle of different taper? (a) Adapter (b) Collet (c) Arbor (d) Carrier **Ans:(a) Adapter**
5	16	A three-jaw chuck is also known as: (a) Independent chuck (b) Self-centering chuck (c) Combination chuck (d) Magnetic chuck **Ans:(b) Self-centering chuck**
5	17	A follower rest is attached to: (a) Headstock (b) Tailstock (c) Bed (d) Saddle/Carriage **Ans:(d) Saddle/Carriage**
5	18	Steady rests are mounted on: (a) Lathe bed (b) Machine table (c) Tool post (d) Workbench **Ans:(a) Lathe bed**
5	19	Face plates are attached to: (a) Lathe spindle (b) Tool post (c) Machine table (d) Workbench **Ans:(a) Lathe spindle**
5	20	Four-way tool posts allow: (a) Mounting four tools for quick change (b) Holding four workpieces (c) Measuring tool wear (d) Adjusting spindle speed **Ans:(a) Mounting four tools for quick change**

U.NO	Q NO	QUESTIONS
5	21	Collets provide: (a) Irregular holding force (b) Loose gripping (c) Uniform gripping around tool shank (d) Clamping one side only **Ans:(c) Uniform gripping around tool shank**
5	22	Purpose of sleeve in tooling is to: (a) Clamp tools (b) Hold workpiece (c) Cut materials (d) Adapt tool shank sizes for fitting **Ans:(d) Adapt tool shank sizes for fitting**
5	23	Angle plate is used to: (a) Grind surfaces (b) Hold workpieces at right angles (c) Hold cutting tools (d) Measure lengths **Ans:(b) Hold workpieces at right angles**
5	24	A four-jaw chuck is also known as: (a) Self-centering chuck (b) Universal chuck (c) Independent chuck (d) Collet chuck **Ans:(c) Independent chuck**
5	25	Device mainly used to clamp flat surface workpieces? (a) Machine Vice (b) Chuck (c) Mandrel (d) Collet **Ans:(a) Machine Vice**
5	26	Power tools are classified based on: (a) Color (b) Power source (c) Size (d) Weight **Ans:(b) Power source**
5	27	Portable tool used for drilling holes in materials is: (a) Hand drill (b) Angle grinder (c) Jigsaw (d) Impact wrench **Ans:(a) Hand drill**
5	28	Drill providing short, rapid reciprocating action for concrete is: (a) Hand drill (b) Hammer Drill (c) Screwdriver (d) Circular saw **Ans:(b) Hammer Drill**
5	29	Handheld power tool used for grinding, cutting, polishing is: (a) Chain saw (b) Jigsaw (c) Impact wrench (d) Angle Grinder **Ans:(d) Angle Grinder**
5	30	Tool delivering high torque to tighten/loosen bolts is: (a) Impact wrench (b) Hammer drill (c) Circular saw (d) Hand drill **Ans:(a) Impact wrench**

U.NO	Q NO	QUESTIONS
5	31	Power saw using toothed circular blade to cut is: (a) Jigsaw (b) Chain saw (c) Circular saw (d) Reciprocating cutter **Ans:(c) Circular saw**
5	32	Saw with reciprocating blade to cut curves is: (a) Circular saw (b) Chain saw (c) Jigsaw (d) Table saw **Ans:(c) Jigsaw**
5	33	Portable saw cutting with rotating chain teeth is: (a) Circular saw (b) Jigsaw (c) Chain saw (d) Hand saw **Ans:(c) Chain saw**
5	34	Angle grinder uses: (a) Saw chain (b) Reciprocating blade (c) Rotating abrasive disc (d) Drill bit **Ans:(c) Rotating abrasive disc**
5	35	Power screwdrivers are used for: (a) Drilling holes (b) Cutting metal (c) Driving screws efficiently (d) Grinding surfaces **Ans:(c) Driving screws efficiently**
5	36	Power tool NOT primarily a cutting tool: (a) Circular saw (b) Jigsaw (c) Impact wrench (d) Chain saw **Ans:(c) Impact wrench**
5	37	Angle grinder is named so because: (a) Cuts at an angle only (b) Cutting head mounted at angle to motor (c) Grinds angles on workpieces (d) Invented by Mr. Angle **Ans:(b) Cutting head mounted at angle to motor**
5	38	Turret indexing enables: (a) Cooling tools (b) Faster spindle rotation (c) Automatic clamping (d) Quick selection of multiple tools **Ans:(d) Quick selection of multiple tools**
5	39	Electrical screwdrivers differ from power screwdrivers by: (a) Being lighter and lighter duty (b) Being heavier and powerful (c) Not used for screws (d) Used only for cutting **Ans:(a) Being lighter and lighter duty**
5	40	Jigsaws use which type of cutter? (a) Abrasive (b) Circular (c) Reciprocating (d) Milling **Ans:(c) Reciprocating**

U.NO	Q NO	QUESTIONS
5	41	Chain saw is used for: (a) Cutting trees/logs (b) Drilling concrete (c) Polishing metals (d) Tightening bolts **Ans:(a) Cutting trees/logs**
5	42	What holds straight-shank drills in drilling machine? (a) Sleeve (b) Socket (c) Drill chuck (d) Adaptor **Ans:(c) Drill chuck**
5	43	Best power tool for cutting metal pipes? (a) Angle grinder (b) Jigsaw (c) Chain saw (d) Hammer drill **Ans:(a) Angle grinder**
5	44	Best tool for curved cut-out in middle of wooden board? (a) Circular saw (b) Chain saw (c) Jigsaw (d) Impact driver **Ans:(c) Jigsaw**
5	45	Device to fit smaller taper shank tool into larger spindle taper hole? (a) Socket (b) Collet (c) Sleeve (d) Chuck **Ans:(c) Sleeve**
5	46	Device to fit larger taper shank tool into smaller spindle taper hole? (a) Sleeve (b) Socket (c) Collet (d) Catch plate **Ans:(b) Socket**
5	47	An arbor is typically mounted on: (a) Workpiece (b) Spindle (c) Machine table (d) Tool post **Ans:(b) Spindle**
5	48	Reciprocating cutters operate by: (a) Oscillating sideways only (b) Rotating continuously (c) Moving back and forth to cut (d) Drilling holes **Ans:(c) Moving back and forth to cut**
5	49	Which device holds tools for quick change on lathe? (a) Machine vice (b) Mandrel (c) Face plate (d) Four-way tool post **Ans:(d) Four-way tool post**
5	50	A device mounted on a lathe spindle to hold and rotate the workpiece is (a) Tailstock (b) Tool post (c) Lead screw (d) Chuck **Ans:(d) Chuck**

U.NO	Q NO	QUESTIONS
5	51	A slender shaft is being turned and vibration occurs near the cutting tool even though the work is supported at both ends. Which device should be added close to the cutting zone? (a) Face plate (b) Mandrel (c) Catch plate (d) Follower rest **Ans:(D) Follower rest**
5	52	A rectangular casting with an irregular shape cannot be gripped securely in a standard chuck. The component needs turning on several faces. Which device would be most appropriate? (a) Drill chuck (b) Collet (c) Sleeve (d) Face plate with suitable clamps **Ans:(D) Face plate with suitable clamps**
5	53	A hollow cylindrical component must be supported accurately from its internal bore while its external surface is machined. Which device should be selected? (a) Mandrel (b) Steady rest (c) Face plate (d) Machine vice **Ans:(A) Mandrel**
5	54	A production lathe requires several tools to be automatically indexed into position for sequential machining operations. Which device is most suitable? (a) Face plate (b) Mandrel (c) Turret tool post (d) Catch plate **Ans:(C) Turret tool post**
5	55	A maintenance worker must cut an irregular curved profile in a thin sheet or board. Which tool would provide the best control? (a) Jigsaw (b) Circular saw (c) Chain saw (d) Impact wrench **Ans:(A) Jigsaw**

PART B

1	1	Explain any two allowances given to a pattern
1	2	Explain the importance of vent holes in moulding
1	3	Differentiate between green sand casting and dry sand casting
1	4	Write short notes on centrifugal casting
1	5	Write the causes and remedies of shrinkage cavity
1	6	Explain the function of parting sand
1	7	List the steps in CO_2 core making process
1	8	Write short notes on tumbling
1	9	Write any four safety practices in foundry
1	10	Write a short note on gravity die casting
1	11	Write short notes on adhesiveness and cohesiveness of moulding sand.
1	12	A thin-walled aluminium component is to be manufactured in large quantities with good surface finish. Select a suitable casting process and justify your choice briefly.
2	1	Differentiate between MIG and TIG welding
2	2	What is the difference between oxidizing and carburizing flames in gas welding?
2	3	Compare soldering and brazing
2	4	Write short notes on shielding gas in welding
2	5	Write short notes on equipmentsused in gas welding
2	6	Write short notes on safety precautions in welding
2	7	Differentiate between spot welding and seam welding
2	8	Write the causes and remedies of slag inclusion
2	9	Explain the causes and remedies of cracks in welding
2	10	Write short notes on radiographic testing
2	11	Compare arc welding and gas welding
2	12	A welded component is suspected to have internal cracks that cannot be seen on the surface. Which testing method would you recommend and why?
3	1	Write down the advantages of hot working
3	2	Comparedrop forging and press forging
3	3	What is the difference between upsetting and drawing down?
3	4	Differentiate between blanking and piercing
3	5	Write short notes on bending operation
3	6	Write short notes on hydraulic press
3	7	Mention the uses of the following accessories in a press a) Pilot b) Knock out

3	8	What is a die and punch in a press?
3	9	What is (i) Cutting off and (ii) Trimming?
3	10	List out the advantages of press forging
3	11	Write the differences between hot rolling and cold rolling
3	12	During a blanking operation, excessive burrs are observed on the edges of the blank. Analyze the reason and suggest corrective measures.
4	1	List out the step by step procedure of making products in powder metallurgy
4	2	Write three design rules for powder metallurgy parts
4	3	Write short notes on infiltration process in powder metallurgy
4	4	Write short notes on mechanical properties of powder metallurgy products
4	5	How full annealing is done?
4	6	Why tempering is necessary after hardening?
4	7	Write short notes on atomization in powder metallurgy
4	8	Name the different types of tempering process
4	9	Write the purpose of heat treatment
4	10	How hardening is done?
4	11	Differentiate between annealing and normalizing.
4	12	A hardened steel component develops cracks after quenching. Analyze the possible causes and suggest suitable corrective measures.
5	1	Compare steady rest and follower rest
5	2	Explain the need of a 4 jaw chuck over 3 jaw chuck
5	3	Write short notes on (i)Machine vice and (ii)T-bolts and clamp
5	4	Differentiate between four-way tool post and turret indexing head
5	5	Write short notes on angle plate
5	6	Write short notes on chain saw and give its uses
5	7	What is an adaptor? Mention its use
5	8	Write short notes on reciprocating cutter
5	9	Discuss the importance of collets in precision machining
5	10	What is a circular saw?Give its uses
5	11	A long slender shaft is producing excessive vibration during turning. Select a suitable work holding device and justify your choice.
5	12	A workshop has to perform repeated machining operations with multiple tools on identicalcomponents. Select a suitable tool holding device and justify your choice.

PART - C

1	1	Describe single piece pattern and split pattern with neat sketches.
1	2	What are pattern allowances? Explain any two allowances to be provided and justify their necessity.
1	3	Draw a simple cross section view of a cupola furnace and explain briefly the operation of cupola furnace.
1	4	Explain the hot chamber die casting process with a neat sketch.
1	5	A casting produced by sand casting shows blowholes and shrinkage defects.Analyze the causes and suggest suitable remedies
1	6	With a neat diagram explain centrifugal casting process. State the advantages and applications of centrifugal casting.
2	1	Briefly explain Tungsten Inert Gas (TIG) Welding with a neat sketch.
2	2	What are the three types of welding flames obtained in oxy acetylene welding process. Explain them and State the application of each flame.
2	3	Classify resistance welding and explain spot welding and projection welding.
2	4	Write short notes on (i) Ultrasonic test (ii) Radiographic test
2	5	A welded joint fails during service. Analyze possible welding defects and recommend suitable remedies.
2	6	With a simple sketch explain the functions of different equipments used in gas welding.
3	1	What is hot working? Explain hot rolling process with a sketch.
3	2	Write the types of forging processes. Explain drop forging process with a neat sketch. Discuss its advantages and applications.
3	3	Explain the working principle of a hydraulic press with a neat sketch.
3	4	Write short notes on i) Channel bending ii) Curling.
3	5	Differentiate blanking and piercing operations and label the scrap part in each operation with sketches.

4	1	What is hardening? Explain the hardening process.
4	2	Describe different types of quenching media and write their applications.
4	3	What are the processes used for metal powder manufacturing? Describe any one process with a sketch.
4	4	Explain sintering process in powder metallurgy with a sketch.
4	5	Discuss mechanical properties and design rules of powder metallurgy parts.
4	6	Explain the different types of tempering processes using iron–carbon equilibrium diagram.

5	1	Differentiate between steady rest and follower rest. Explain their applications.
5	2	Describe the uses of machine vice and V-block as work holding devices.
5	3	Select a suitable work holding setup for machining a long shaft on a lathe.Justify your choice with sketch.
5	4	Explain the working of impact screwdriver with a sketch. Write its applications.
5	5	Explain the working of chain saw with a sketch. Give its applications.