INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

MECHANICAL ENGINEERING

DEFINITIONS AND TERMINOLOGY

Course Name	:	**PRODUCTION TECHNOLOGY**
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OBJECTIVES

I	To help students to consider in depth the terminology and nomenclature used in the syllabus.
II	To focus on the meaning of new words / terminology/nomenclature

DEFINITIONS AND TERMINOLOGYQUESTION BANK

S No	QUESTION	ANSWER	Blooms Level	CLO	CLO Code
UNIT - I					
1	Define dry sand mould?	All parts of the mould are dried in an oven before being reassembled for casting.	Understand	CLO 1	CAME006.01
2	Define choke?	It is the deep area after sprue to guide the molten metal to travel in runner	Understand	CLO 1	CAME006.01
3	What is a flask?	A metal or wood frame without fixed top or bottom, in which the mold formed.	Remember	CLO 1	CAME006.01
4	What is parting line?	This is the dividing line between the two molding flasks that makes up the mold.	Understand	CLO 1	CAME006.01
4	What is molding sand?	Sand, which binds strongly without losing its permeability. It is a mixture of silica sand, clay and moisture un appropriate proportions.	Understand	CLO 1	CAME006.01
5	What is facing sand?	The small amount of carbonaceous material sprinkled on the inner surface of the mold cavity to give a better surface finish to the castings.	Understand	CLO 2	CAME006.02
6	What is a core?	A separate part of the mold made of sand and generally baked, which is used to create various shaped cavities in the castings.	Remember	CLO 2	CAME006.02
7	Define sweep moulding?	This are in the shape of surface of revolution along the fixed axis in 2d format	Understand	CLO 2	CAME006.02
8	What is a slick?	It is a small double ended tool having a flat on one end and a spoon on the other end.	Remember	CLO 2	CAME006.02
9	What is a runner?	The channel through which the molten metal carried from the sprue to the gate.	Remember	CLO 2	CAME006.02
10	What is squeeze machine?	It is where the mould box is squeezed between the machine table and overhead squeeze board with the help of pneumatically or hydraulically.	Remember	CLO 3	CAME006.03
12	What is a rammer?	It is a wood tool used for packing or ramming the sand into mould.	Understand	CLO 3	CAME006.03
13	What is vent on mold?	Small opening in the mold to facilitate escape of air gases	Understand	CLO 3	CAME006.03
14	Define Liquid Shrinkage?	Reduction in volume when the metal changes from liquid state to solid state at the solidus temperature	Remember	CLO 3	CAME006.03
15	Define solid shrinkage?	Reduction in the volume caused when the metal loses temperature in the solid state	Understand	CLO 3	CAME006.03
16	Define centrifugal casting?	Molten metal is poured into moulds while they are rotating with centrifugal forces.	Understand	CLO 4	CAME006.04

S No	QUESTION	ANSWER	Blooms Level	CLO	CLO Code
17	Define casting yield?	It is the ratio of weight of the casting /weight of poured metal*100	Understand	CLO 4	CAME006.04
18	Explain the cause of blow hole?	It causes because of moisture and slag inclusion	Understand	CLO 4	CAME006.04
19	What is a casting?	Casting is a manufacturing process in which a liquid material is usually poured into a mold, which contains a hollow cavity of the desired shape, and then allowed to solidify. The solidified part is also known as a casting, which is ejected or broken out of the mold to complete the process	nderstanding	CLO 1	CAME006.01
20	What is pattern?	An approximate duplicate of the final casting used to form the mold cavity.	nderstanding	CLO 1	CAME006.01
21	Explain cope and drag?	Cope: The top half of the pattern, flask, mold, or core. Drag: The bottom half of the pattern, flask, mold, or core.	Remember	CLO 1	CAME006.01
22	What is a Gating system?	The network of connected channels that deliver the molten material to the mold cavities.	nderstanding	CLO 1	CAME006.01
23	What is a sprue?	The pouring cup attaches to the sprue, which is the vertical part of the gating system. The other end of the sprue attaches to the runners.	nderstanding	CLO 1	CAME006.01
24	What is Mold cavity?	The combined open area of the molding material and core, where the metal is poured to produce the casting.	nderstanding	CLO 2	CAME006.02
25	Define Pouring cup or pouring basin?	The part of the gating system that receives the molten material from the pouring vessel.	Remember	CLO 2	CAME006.02
26	What is Riser?	An extra void in the mold that fills with molten material to compensate for shrinkage during solidification.	nderstanding	CLO 2	CAME006.02
27	Define Chaplet?	Long vertical holding rod for core that after casting it become the integral part of casting, provide the support to the core.	Remember	CLO 2	CAME006.02
28	Define cooling curves?	Cooling curves are important in controlling the quality of a casting. The most important part of the cooling curve is the cooling rate which affects the microstructure and properties.	Remember	CLO 2	CAME006.02
29	Explain about Solidification?	Solidification, also known as freezing, is a phase change of matter that results in the production of a solid. Generally, this occurs when the temperature of a liquid is lowered below its freezing point.	Remember	CLO 3	CAME006.03
30	What is the meaning of pattern Allowance?	Allowance in Pattern generally +or- mm given in the original dimensions of the pattern Allowance are given because easy remove of pattern from sand mold	nderstanding	CLO 3	CAME006.03
31	What is Binder?	The bonding agent used as an additive to mold or core sand to improve the strength	nderstanding	CLO 3	CAME006.03
32	Define the term chill?	A chill is an object used to promote solidification in a specific portion of a metal casting mold. Normally the metal in the mold cools at a certain rate relative to thickness of the casting.	Remember	CLO 3	CAME006.03

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33	What is die casting?	Die casting is a metal casting process that is characterized by forcing molten metal under high pressure into a mold cavity. The mold cavity is created using two hardened tool steel dies which have been machined into shape and work similarly to an injection mold during the process.	nderstanding	CLO 3	CAME006.03
34	What is shrinkage?	A casting defect is an undesired irregularity in a metal casting process. They are broken down into five main categories: gas porosity, shrinkage defects, mold material defects, pouring metal defects, and metallurgical defects.	nderstanding	CLO 4	CAME006.04
35	What is sprue?	Sprue is the passage through which a molten material is introduced into a mold, and the term also refers to the excess material which solidifies in the sprue passage. In sand casting, the sprue is formed by a dowel, which is removed from the sand to make the hole into which the metal is poured.	nderstanding	CLO 4	CAME006.04
36	What is Shrinkage cavity?	Shrinkage cavities are usually located in the upper portion of an ingot or in those spaces within a casting where the molten metal is last to enter during pouring.	nderstanding	CLO 4	CAME006.04
37	Define Investment casting?	Investment casting (known as lost-wax casting in art) is a process that has been practiced for thousands of years, with the lost-wax process being one of the oldest known metal forming techniques.		CLO 4	CAME006.04
38	Explain die casting process?	The die casting process forces molten metal under high pressure into mold cavities (which are machined into dies).	Remember	CLO 4	CAME006.04
UNIT – II					
1	Define weldability?	The capacity of being welded into in separable joints having specific properties.	Understand	CLO 5	CAME006.05
2	Define melting point in welding?	It's the temperature possess by the metal to undergo weld to its metal state.	Understand	CLO 5	CAME006.05
3	Define plastic welding?	The pieces of metal to be joined are he ated to plastic state and then forced by external	Understand	CLO 5	CAME006.05
4	What is non pressure welding?	The material at the joint is heated to molten state and allowed to solidify.	Understand	CLO 5	CAME006.05
5	Define cold welding?	Joints are obtained without application of heat. But by application of pressure.	Understand	CLO 6	CAME006.06
6	Define chilled casting?	The surrounding parts are good conductors of heat they by its termed as chilled casting	Understand	CLO 6	CAME006.06
7	Define slag in weld?	Unwanted material in the molten weld pool is slag	Understand	CLO 6	CAME006.06
8	Define metal preparation?	Preparing the melts to be joining using external heat before weld	Understand	CLO 6	CAME006.06

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9	Define oxy acetylene weld?	Welding created using oxy acetylene mixture with heat liberation	Understand	CLO 6	CAME006.06
10	Define neutral flame?	When gases are supplied to the torch in equal volumes, a neutral flame is produced.	Remember	CLO 7	CAME006.07
11	Define carburizing flame?	When excess of acetylene is supplied in the weld torch the flame emerged is carburizing flame.	Remember	CLO 7	CAME006.07
12	What is oxidizing flame?	Flame emerges when oxygen supply is heavy than the acetylene for welding.	Understand	CLO 7	CAME006.07
13	Define leftward welding?	Weld is made working from right to left while blow pipe is hold in right hand and weld rod in left hand	Remember	CLO 7	CAME006.07
14	Define rightward weld?	Welding carried out from left to right the rod following the blowpipe	Understand	CLO 8	CAME006.08
15	Define pressure regulator?	Which reduces the cylinder pressure to the required working condition and steady flow	Remember	CLO 8	CAME006.08
16	Define carbon arc welding?	Negative electrode used as carbon metal and positive being weld material without filler rod	Remember	CLO 8	CAME006.08
17	Define flux-cored arc welding?	An inside-out wire with the flux inside a tubular electrode with constant voltage dc supply	Understand	CLO 8	CAME006.08
18	Define submerged arc welding?	It is automatic process where arc is formed between end of continuous depositing surface under a layer of flux	Understand	CLO 8	CAME006.08
19	what is welding?	Welding is a fabrication or sculptural process that joins materials, usually metals or thermoplastics, by causing fusion, which is distinct from lower temperature metal-joining techniques such as brazing and soldering, which do not melt the base metal.	nderstanding	CLO 5	CAME006.05
20	What is an Arc?	The physical gap between the end of the electrode and the base metal. The physical gap causes heat due to resistance of current flow and arc rays.	nderstanding	CLO 5	CAME006.05
21	What is arc welding?	It is a type of welding that uses a welding power supply to create an electric arc between a metal stick (electrode) and the base material to melt the metals at the point-of-contact. Arc welding processes may be manual, semi-automatic, or fully automated.	nderstanding	CLO 5	CAME006.05
22	What is Gas welding?	Gas welding is a process of construction that involves the use of gases as well as oxygen to weld metals together. Other names for gas welding are oxyacetylene welding and oxy welding. Developed in 1903, gas welding is used to weld pipes and tubes together while also being an effective way to repair metal.	nderstanding	CLO 5	CAME006.05
23	What is arc cutting?	In an arc cutting, carbon or graphite electrode is used to melt the metal to achieve a cut on metals.	nderstanding	CLO 5	CAME006.05
24	What is filler metal?	The metal (material) to be added in making a welded, brazed, or soldered joint.	nderstanding	CLO 6	CAME006.06

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25	What is filled weld?	The position in which welding is performed on the upper side of an approximately horizontal plane and the face of the weld lies in an approximately vertical plane.	nderstanding	CLO 6	CAME006.06
26	What is flux?	Material used to prevent, dissolve, or facilitate removal of oxides and other undesirable surface substances.	nderstanding	CLO 6	CAME006.06
27	What is flowability?	The ability of molten filler metal to flow or spread over a metal surface.	nderstanding	CLO 6	CAME006.06
28	What is fusion?	The melting together of filler metal and base metal (substrate), or of base metal only, which results in coalescence.	nderstanding	CLO 6	CAME006.06
29	Define Temporary weld?	A weld made to attach a piece or pieces to a weldment for temporary use in handling, shipping, or working on the weldment.	Remember	CLO 7	CAME006.07
30	Define thermal stresses?	Stresses in metal resulting from non-uniform temperature distribution.	Remember	CLO 7	CAME006.07
31	What is torch?	A device used in the TIG (GTAW) process to control the position of the electrode, to transfer current to the arc and to direct the flow of the shielding gas.	nderstanding	CLO 7	CAME006.07
32	Define welding rod?	A form of filler metal used for welding or brazing which does not conduct the electrical current.	Remember	CLO 7	CAME006.07
33	Define welding technique?	The details of a welding procedure which are controlled by the welder or welding operator.	Remember	CLO 7	CAME006.07
34	What is weldment?	An assembly whose component parts are joined by welding.	nderstanding	CLO 8	CAME006.08
35	Define wetting?	The bonding or spreading of a liquid filler metal or flux on a solid base metal.	Remember	CLO 8	CAME006.08
36	Define work angle?	The angle that the electrode makes with the referenced plane or surface of the base metal in a plane perpendicular to the axis of the weld.	Remember	CLO 8	CAME006.08
37	What is work lead?	The electric conductor between the source of arc welding current and the work.	nderstanding	CLO 8	CAME006.08
38	What is welding head?	The part of a welding machine or automatic welding equipment in which a welding gun or torch is incorporated.	nderstanding	CLO 8	CAME006.08
UNIT – III					
1	Define Thermit welding?	It is process for welding metal is based on the chemical reaction between finely divided aluminium and iron oxide.	Remember	CLO 9	CAME006.09
2	Define explosive weld?	It is carried out by bringing together properly paired metal surface with high relative velocity at a high pressure caused by explosive.	Understand	CLO 9	CAME006.09
3	Define ultrasonic weld?	Welding caused by high frequency vibratory energy in to overlapping metals into the area to be joined.	Remember	CLO 9	CAME006.09

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4	Define electron beam welding?	Welding caused by the fast moving beam of electrons focused on the work piece.	Remember	CLO 9	CAME006.09
5	Define laser weld?	Welding carried out using very high intense beam of optical radiation.	Understand	CLO 9	CAME006.09
6	Define bronze welding?	A low melting alloy is introduced between metals and joint is produced by adhesion.	Remember	CLO 10	CAME006.10
7	What is soft soldering?	It is employed for joining wires and small parts using blow torch.	Remember	CLO 10	CAME006.10
8	What is hot soldering?	Its employs solders which melts at higher temperatures and are strong than those in other soldering	Understand	CLO 10	CAME006.10
9	Define spelte?	Harder filler material used in joint of soldering materials	Remember	CLO 10	CAME006.10
10	Define H in resistance welding?	$H= I^2RT$ where H is heat, I is current, R is resistance and T is Time	Remember	CLO 10	CAME006.10
12	Define poor fusion?	The lack of thorough and complete union between the deposited and parent metal.	Understand	CLO 11	CAME006.11
13	Define depth of weld?	The distance that fusion extends into the base metal or previous pass from the surface melted during welding.	Remember	CLO 11	CAME006.11
14	Define slag inclusion?	The presences of nonmetallic substances in the metal when fusion takes place	Understand	CLO 11	CAME006.11
15	Define corner joint?	Joining the edges of two sheets or plates surface arc at an angle of 90^0 to each other	Understand	CLO 11	CAME006.11
16	Define Heat Zone?	It is the volume of material at or near the weld which properties have been altered due to the weld heat.	Remember	CLO 12	CAME006.12
17	What is optical radiation?	The radiation generated by the welding arc which is effecting the eyes	Remember	CLO 12	CAME006.12
18	Define fumes?	Rise of gases with oxides of metals in the environmental	Understand	CLO 12	CAME006.12
19	Define friction welding?	Welding caused by rubbing action of two metals	Understand	CLO 12	CAME006.12
20	Define TIG Welding?	Also known as GTAW (gas tungsten arc welding) this welding process welds using the heat of a non-consumable tungsten electrode. Filler metal can be used and argon inert gas or inert gas mixtures are used for shielding.	Remember	CLO 9	CAME006.09
21	What is MIG Welding?	MIG is an acronym for Metal-Inert-Gas, also known as GMAW or Gas Metal Arc Welding. This arc welding process uses a spooled, continuously fed filler metal (consumable) electrode. Shielding is provided by externally supplied gas or gas mixtures.	nderstanding	CLO 9	CAME006.09

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22	Define molten weld pool?	The liquid state of a weld prior to solidification as weld metal.	Remember	CLO 9	CAME006.09
23	Define plasma?	A gas that has been heated to an at least partially ionized condition, enabling it to conduct an electric current.	Remember	CLO 9	CAME006.09
24	What is porosity?	Cavity type discontinuities formed by gas entrapment during solidification.	nderstanding	CLO 9	CAME006.09
25	Define pre-heating?	The application of heat to the base metal immediately before welding, brazing, soldering, thermal spraying, or cutting.	Remember	CLO 10	CAME006.10
26	Define Shielded metal arc welding (SMAW)?	An arc welding process which produces coalescence of metals by heating them with an arc between a covered metal electrode and the work. Shielding is obtained from decomposition of the electrode covering. Pressure is not used and filler metal is obtained from the electrode.	Remember	CLO 10	CAME006.10
27	What is shrinkage void?	A cavity-type discontinuity normally formed by shrinkage during solidification.	nderstanding	CLO 10	CAME006.10
28	Define spot welding?	A weld made between or upon overlapping members in which coalescence may start and occur on the faying surfaces or may proceed from the surface of one member. The weld cross section (plan view) is approximately circular.	Remember	CLO 10	CAME006.10
29	Define T-joint?	A joint between two members located approximately at right angles to each other in the form of a T.	Remember	CLO 10	CAME006.10
30	What is inert gas?	A gas which does not normally combine chemically with the base metal or filler metal. See also protective atmosphere.	nderstanding	CLO 11	CAME006.11
31	Define depth of fusion?	The distance that fusion extends into the base metal or previous pass from the surface melted during welding.	Remember	CLO 11	CAME006.11
32	What is soldering?	It is a process in which two or more items are joined together by melting and putting a filler metal (*solder*) into the joint, the filler metal having a lower melting point than the adjoining metal. Unlike welding, *soldering* does not involve melting the work pieces.	nderstanding	CLO 11	CAME006.11
33	What is Brazing?	It is the use of a bronze or brass filler rod coated with flux to join steel workpieces. The equipment needed for braze welding is basically identical to the equipment used in brazing.	nderstanding	CLO 11	CAME006.11
34	Define defects?	A welding defect is any flaw that compromises the usefulness of a weldment.	Remember	CLO 11	CAME006.11
35	Define Heat Affected Zone?	The Heat Affected Zone (HAZ) is the volume of material at or near the weld which properties have been altered due to the weld heat. Since the resistance welding process relies on heating two parts, some amount of HAZ is inevitable.	Remember	CLO 12	CAME006.12
36	what is non-destructive testing of welds?	Welds may be tested using NDT techniques such as industrial radiography or industrial CT scanning using X-rays or gamma rays, ultrasonic testing, liquid penetrant testing, magnetic particle inspection or via eddy current.	nderstanding	CLO 12	CAME006.12

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37	what is destructive testing of welds?	A number of destructive weld testing methods are used to determine weld integrity or performance. Typically, they involve sectioning and/or breaking the welded component and evaluating various mechanical and / or physical characteristics.	nderstanding	CLO 12	CAME006.12
38	Define hot and cold crack?	Hot Crack – It is more prominent during crystallization of weld joints where the temperature can rise more than 10,000-degree Celsius. Cold Crack – This type of crack occurs at the end of the welding process where the temperature is quite low. Sometimes cold crack is visible several hours after welding or even after few days.	Remember	CLO 12	CAME006.12
39	What is undercut?	When the base of metal melts away from the weld zone, then a groove is formed in the shape of a notch, then this type of defect is known as Undercut. It reduces the fatigue strength of the joint.	nderstanding	CLO 12	CAME006.12
UNIT - IV					
1	What is mechanical working?	Plastic deformation performed to change dimensions, properties and surface condition by mechanical means of pressure.	Understand	CLO 4	CAME006.04
2	Define warm working?	Metal deformation carried out at temperatures intermediate to hot and cold forming is called Warm Forming	Understand	CLO 4	CAME006.04
3	Define deformation temperature?	It is a particular temperature point below the melting point of a metal (or material)	Remember	CLO 13	CAME006.13
4	What id radial Drawing?	Cup drawing test uses a circular blank from the metal to be tested. It is inserted in a die, and the severity of the draw it is able to withstand without tearing called the drawing ratio, is noted. The drawing ratio is the ratio of the cup diameter to the blank diameter.	Remember	CLO 13	CAME006.13
5	What is Normal Anisotropy Coefficient?	The anisotropy coefficient is derived from the ratio of the plastic width strain the thickness strain. A material with a high plastic anisotropy also has a greater “thinning resistance.” In general, the higher the anisotropy coefficient the better the material deforms in drawing operations.	Understand	CLO 13	CAME006.13
6	Define shearing?	Shearing is a cutting operation used to remove a blank of required dimensions from a large sheet	Remember	CLO 14	CAME006.14
7	What is trimming?	When parts are produced by die casting or drop forging, a small amount of extra metal gets spread out at the parting plane. This extra metal, called flash, is cut – off before the part is used, by an operation called trimming. The operation is very similar to blanking and the dies used are also similar to blanking dies.	Understand	CLO 14	CAME006.14
8	What is notching?	It is an operation in which a specified small amount of metal is cut from a blank. It is different from punching in the sense that in notching cutting line of the slug formed must touch one edge of the blank or strip.	Remember	CLO 14	CAME006.14

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9	What is nibbling?	Nibbling is variation of notching, with overlapping notches being cut into the metal. The operation may be resorted to produce any desired shape, for example flanges, collars, etc	Remember	CLO 14	CAME006.14
10	Define Perforating?	Perforating is an operation is which a number of uniformly spaced holes are punched in a sheet of metal. The holes may be of any size or shape. They usually cover the entire sheet of metal.	Remember	CLO 15	CAME006.15
11	What is bend allowance?	It is the length of the neutral axis in the bend. This determines the blank length needed for a bent part. It can be approximately estimated from the relation $L_b = a (R + kt)$	Understand	CLO 15	CAME006.15
12	What is minimum bend radius?	As the ratio of the bend radius to the thickness of sheet (R / t) decreases, the tensile strain on the outer fibres of sheet increases. If R / t decrease beyond a certain limit, cracks start appearing on the surface of material. This limit is called Minimum Bend Radius for the material.	Understand	CLO 15	CAME006.15
13	What is Bending Force?	There are two general types of die bending: V – die bending and wiping die bending. V – die bending is used expensively in brake die operations and stamping die operations. The bending force can be estimated from the following simple relation.P = k.Y.L.t2 / D	Understand	CLO 15	CAME006.15
14	Define embossing?	Embossing is an operation in which sheet metal is drawn to shallow depths with male and female matching dies.	Understand	CLO 15	CAME006.15
15	What is single action presses?	A single action press has one reciprocation slide that carries the tool for the metal forming operation. The press has a fixed bed. It is the most widely used press for operations like blanking, coining, embossing, and drawing.	Understand	CLO 15	CAME006.15
16	What is double action presses?	A double action press has two slides moving in the same direction against a fixed bed. It is more suitable for drawing operations, especially deep drawing, than single action press	Understand	CLO 16	CAME006.16
17	Define triple action presses?	Triple action press has three moving slides. Two slides (the blank holder and the inner slide) move in the same direction as in a double – action press and the third or lower slide moves upward through the fixed bed in a direction opposite to that of the other two slides. This action allows reverse – drawing, forming or bending operations against the inner slide while both upper actions are dwelling.	Understand	CLO 16	CAME006.16
18	What is dial feed?	Dial feeds consist of rotary indexing tables (or turntables) having fixtures for holding workpieces as they are taken to the press tooling.	Remember	CLO 16	CAME006.16
19	What is hot working process?	When plastic deformation of metal is carried out at temperature above the recrystallization temperature the process, the process is known as hot working.	nderstanding	CLO 4	CAME006.04
20	What is cold working process?	If this deformation is done below the recrystallization temperature the process is known as cold working.	nderstanding	CLO 4	CAME006.04

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21	Define recrystallisation temperature?	The recrystallisation temperature for steels is typically between 400 and 700°C. The recrystallisation conditions, such as heating rate and soaking time depend on the degree of cold work and the steel composition.	Remember	CLO 13	CAME006.13
22	Explain strain hardening?	is the strengthening of a metal or polymer by plastic deformation. This strengthening occurs because of dislocation movements and dislocation generation within the crystal structure of the material.	Remember	CLO 13	CAME006.13
23	What is Recovery?	Recovery is a process by which deformed grains can reduce their stored energy by the removal or rearrangement of defects in their crystal structure	nderstanding	CLO 13	CAME006.13
24	Explain metal rolling?	In metalworking, rolling is a metal forming process in which metal stock is passed through one or more pairs of rolls to reduce the thickness and to make the thickness uniform. The concept is similar to the rolling of dough.	Remember	CLO 14	CAME006.14
25	What is Stamping?	Stamping includes a variety of sheet-metal forming manufacturing processes, such as punching using a machine press or stamping press, blanking, embossing, bending, flanging, and coining	nderstanding	CLO 14	CAME006.14
26	Explain Forming processes?	Forming processes are particular manufacturing processes which make use of suitable stresses (like compression, tension, shear or combined stresses) which cause plastic deformation of the materials to produce required shapes.	Remember	CLO 14	CAME006.14
27	Define blanking?	Punching or blanking is a process in which the punch removes a portion of material from the larger piece or a strip of sheet metal. If the small removed piece is the useful part and the rest is scrap, the operation is called blanking	Remember	CLO 14	CAME006.14
28	Define piercing?	It is a process by which a hole is cut (or torn) in metal. It is different from punching in that piercing does not generate a slug. Instead, the metal is pushed back to form a jagged flange on the back side of the hole.	Remember	CLO 15	CAME006.15
29	What is bending?	Bending is a manufacturing process that produces a V-shape, U-shape, or channel shape along a straight axis in ductile materials, most commonly sheet metal.	nderstanding	CLO 15	CAME006.15
30	what is drawing process?	Drawing is a metal working process which uses tensile forces to stretch metal or glass. As the metal is drawn (pulled), it stretches thinner, into a desired shape and thickness.	nderstanding	CLO 15	CAME006.15
31	What is Wire drawing?	Wire drawing is a metal working process used to reduce the cross-section of a wire by pulling the wire through a single, or series of drawing die(s). Although similar in process, drawing is different from extrusion, because in drawing the wire is pulled, rather than pushed, through the die.	nderstanding	CLO 15	CAME006.15
32	what is tube drawing process?	Tube drawing is a process to size a tube by shrinking a large diameter tube into a smaller one, by drawing the tube through a die. This process produces high-quality tubing with precise dimensions, good surface finish, and the added strength of cold working.	nderstanding	CLO 15	CAME006.15
33	what is coining process?	Coining is a closed die forging process, in which pressure is applied on the surface of the forging in order to obtain closer tolerances, smoother surfaces and eliminate draft.	nderstanding	CLO 15	CAME006.15

S No	QUESTION	ANSWER	Blooms Level	CLO	CLO Code
		Closed die forging is a process in which forging is done by placing the work piece between two shaped dies.			
34	What is hot spinning?	Hot spinning involves spinning a piece of metal on a lathe while high heat from a torch is applied to the workpiece.	nderstanding	CLO 16	CAME006.16
35	What is cold spinning?	Metal spinning, also known as spin forming or spinning or metal turning most commonly, is a metalworking process by which a disc or tube of metal is rotated at high speed and formed into an axially symmetric part. Spinning can be performed by hand or by a CNC lathe.	nderstanding	CLO 16	CAME006.16
36	What is Press tools?	Press tools are commonly used in hydraulic, pneumatic, and mechanical presses to produce the sheet metal components in large volumes	Remember	CLO 16	CAME006.16
37	What is deep drawing?	Deep drawing is one of the most widely used processes in sheet metal forming. Apart from its use in many other sectors, it is applied in the automotive industry for the manufacturing of car body parts.	nderstanding	CLO 16	CAME006.16
38	Explain metal forming simulation?	In metal forming simulation, the forming of sheet metal is simulated on the computer with the help of special software. Simulation makes it possible to detect errors and problems, such as wrinkles or splits in parts, on the computer at an early stage in forming.	Remember	CLO 16	CAME006.16
UNIT - V					
1	What is die hummer forging?	It is the simplest forging process which is quite flexible but not suitable for large scale production. It is a slow process. The resulting size and shape of the forging are dependent on the skill of the operator.	Understand	CLO 5	CAME006.05
2	Define die drop forging?	The process uses shaped dies to control the flow of metal. The heated metal is positioned in the lower cavity and on it one or more blows are struck by the upper die. This hammering makes the metal to flow and fill the die cavity completely. Excess metal is squeezed out around the periphery of the cavity to form flash.	Understand	CLO 4	CAME006.04
3	Define precession forging?	The metal is deformed in cavity so that no flash is formed and the final dimensions are very close to the desired component dimension.	Understand	CLO 17	CAME006.17
4	Define forging force?	The forging force, F, required to forge material by impression – die forging operation can be determined by the relation, F = k . s f . A	Remember	CLO 17	CAME006.17
5	Define wire drawing?	Wire drawing is primarily the same as bar drawing except that it involves smaller – diameter material that can be coiled. It is generally performed as a continuous operation on draw bench.	Remember	CLO 17	CAME006.17
6	Define forgeability?	The ability of the metal to deform without rupture.	Remember	CLO 17	CAME006.17

S No	QUESTION	ANSWER	Blooms Level	CLO	CLO Code
7	What is box furnace?	These furnaces are constructed of a rectangular steel frame with one or more burners for gas	Understand	CLO 17	CAME006.17
8	What is induction furnace?	The stocks are passed through induction coils in the furnace.	Remember	CLO 11	CAME006.11
9	Define forging temperature?	Metal must be heated to a temperature at which it will possess high plastic properties both at the beginning and at the end of the process.	Remember	CLO 11	CAME006.11
10	Define finishing temperature?	The temperature at which the hammering of a forging is left off.	Remember	CLO 11	CAME006.11
11	Define upsetting?	It is process of increasing the thickness of bar at the expense of its length and brought by the end pressure.	Remember	CLO 18	CAME006.18
12	Define setting down?	It is a localized thinning down the effect by the set hammer or set	Understand	CLO 18	CAME006.18
13	Define fullering?	The axis of the job is positioned perpendicular to the width of the flat die.	Understand	CLO 18	CAME006.18
14	Define power forging?	Machines which help in blowing with pressure.	Understand	CLO 18	CAME006.18
15	Define annealing?	It is a for the heat treatment which is applied to remove stresses and improve the mechanical properties.	Understand	CLO 18	CAME006.18
16	Define normalizing?	Heating in furnace and subsequent cooling of air	Understand	CLO 7	CAME006.07
17	Define hammer capacity?	The amount of energy needed for particular job ie 4 kgf per cm^2 of cross sectional area to be worked in material.	Understand	CLO 18	CAME006.18
18	Define productivity?	Productivity =output/input.	Understand	CLO 18	CAME006.18
19	What is Extrusion?	Extrusion is a process used to create objects of a fixed cross-sectional profile. A material is pushed through a die of the desired cross-section. The extrusion process can be done with the material hot or cold. Commonly extruded materials include metals, polymers, ceramics, concrete, modelling clay, and foodstuffs.	Understanding	CLO 5	CAME006.05
20	Explain Hot extrusion?	Hot extrusion is a hot working process, which means it is done above the material's recrystallization temperature to keep the material from work hardening and to make it easier to push the material through the die.	Understanding	CLO 4	CAME006.04
21	Explain cold extrusion?	Cold extrusion is done at room temperature or near room temperature.	nderstanding	CLO 17	CAME006.17
22	Explain forging?	Forging isa manufacturing process involving the shaping of metal using localized compressive forces.	Remember	CLO 17	CAME006.17
23	Define backward extrusion?	Indirect extrusion (backward extrusion) is a process in which punch moves opposite to that of the billet. Here there is no relative motion between container and billet.	Remember	CLO 17	CAME006.17

S No	QUESTION	ANSWER	Blooms Level	CLO	CLO Code
24	Define direct extrusion?	Direct extrusion can be employed for extruding solid circular or non-circular sections, hollow sections such as tubes or cups.	Remember	CLO 17	CAME006.17
25	What is Impact extrusion?	Hollow sections such as cups, toothpaste containers are made by impact extrusion. It is a variation of indirect extrusion. The punch is made to strike the slug at high speed by impact load. Tubes of small wall thickness can be produced. Usually metals like copper, aluminium, lead are impact extruded.	nderstanding	CLO 17	CAME006.17
26	Define tube extrusion?	Employing hollow billet and a mandrel at the end of the ram, hollow sections such as tubes can be extruded to closer tolerences. The mandrel extends upto the entrance of the die.	Remember	CLO 11	CAME006.11
27	Define hydrostatic extrusion?	In hydrostatic extrusion the container is filled with a fluid. Extrusion pressure is transmitted through the fluid to the billet. Friction is eliminated in this process because of there is no contact between billet and container wall. Brittle materials can be extruded by this process.	Remember	CLO 11	CAME006.11
28	Define smith forging?	Open-die forging is also known as smith forging. In open-die forging, a hammer strikes and deforms the workpiece, which is placed on a stationary anvil.	Remember	CLO 11	CAME006.11
29	Define Roll forging?	Roll forging is a forging technique used to reduce the thickness of a metal bar, while simultaneously increasing its length. A good candidate for roll forging is cylindrical piece of metal. The roll forging process begins with the heating of the metal to be shaped.	Remember	CLO 18	CAME006.18
30	What is Rotary forging?	Rotary forging is a specific cold forging technology which uses incremental steps locally with the material to accurate, precision results.	nderstanding	CLO 18	CAME006.18
31	What is Cold forging?	Cold forging is a manufacturing process where a bar stock is inserted into a die and squeezed with a second closed die. The deformation starts at room temperature and changes the shape and size of the initial part until it has assumed the shape of the die.	nderstanding	CLO 18	CAME006.18
32	What is Swaging?	Swaging is a forging process in which the dimensions of an item are altered using dies into which the item is forced. Swaging is usually a cold working process, but also may be hot worked.	nderstanding	CLO 18	CAME006.18
33	What is Cold forging?	Various forging processes conducted at or near ambient temperatures to produce metal components to close tolerances and net shape. These include bending, cold drawing, cold heading, coining, extrusion (forward or backward), punching, thread rolling and others.	nderstanding	CLO 18	CAME006.18
34	Define Cross forging?	Preliminary working of forging stock in alternate planes, usually on flat dies, to develop mechanical properties, particularly in the center portions of heavy sections.	nderstanding	CLO 7	CAME006.07
35	What is Die set?	The assembly of the upper and lower die shoes (punch and die holders), usually including the guide pins, guide pin bushings, and heel blocks.	nderstanding	CLO 18	CAME006.18
36	What is Hammer forging?	The mechanical forming of metal by means of a hammer. The action of the hammer is that of an instantaneous application of pressure in the form of a sudden blow.	nderstanding	CLO 18	CAME006.18

S No	QUESTION	ANSWER	Blooms Level	CLO	CLO Code
37	Define Impression?	A cavity, or series of cavities (multiple), machined into a forging die to produce a desired configuration in the workpiece during forging.	nderstanding	CLO 18	CAME006.18
38	What is Mandrel?	A blunt-ended tool or rod used to retain or enlarge the cavity in a hollow metal product during forging.	nderstanding	CLO 18	CAME006.18

Signature of the Faculty **Signature of the HOD**