



# INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

## MECHANICAL ENGINEERING

### DEFINITIONS AND TERMINOLOGY QUESTION BANK

Course Name	:	<b>MACHINE DESIGN</b>
Course Code	:	<b>AME015</b>
Program	:	<b>B.Tech</b>
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Course Faculty	:	<b>Dr. G V R Seshagiri Rao, Professor, ME</b>

#### OBJECTIVES:

The course should enable the students to:	
I	Ability to identify design variables and performance factors in the study of journal bearings.
II	Ability to identify different types of rolling contact bearings, their basic features, related terminology and designations
III	Ability to select rolling contact bearings for a given application
IV	Awareness of the basic features of prime movers and the means of power transmission commonly used in mechanical engineering
V	Ability to analyze and design all types of gears for given application

### DEFINITIONS AND TERMINOLOGY QUESTION BANK

S.No	QUESTION	ANSWER	Blooms Level	CO	CLOCODE
<b>UNIT-I DESIGN OF BEARINGS</b>					
1	What is bearing and types of bearing?	A bearing is a device that is used to enable rotational or linear movement, while reducing friction and handling stress. Resembling wheels, bearings literally enable devices to roll, which reduces the friction between the surface of the bearing and the surface it's rolling over.	Understand	CO1	AME015.01
2	What is a bearing load?	Load can be applied to bearings in either of two basic directions. Radial loads act at right angles to the shaft (bearing's axis of rotation). Axial (thrust) acts parallel to the axis of rotation.	Understand	CO1	AME015.01
3	What do you mean by ball bearing?	A ball bearing is a type of rolling-element bearing that uses balls to maintain the separation between the bearing races. The purpose of a ball bearing is to reduce rotational friction and support radial and axial loads. However, they can tolerate some misalignment of the inner and outer	Understand	CO1	AME015.01

S.No	QUESTION	ANSWER	Blooms Level	CO	CLOCODE
		ances.			
4	What is SKF Bearing?	AB SKF (Swedish:Swedish ball bearing factory AB), later AB SKF, is a leading bearing and seal manufacturing company founded in Gothenburg, Sweden, in 1907.	Understand	CO1	AME015.01
5	What is equivalent bearing load?	When both dynamic radial loads and dynamic axial loads act on a bearing at the same time, the hypothetical load acting on the center of the bearing which gives the bearings the same life as if they had only a radial load or only an axial load is called the dynamic equivalent load.	Understand	CO1	AME015.02
6	Define rating life	Bearing rating life. ... The basic rating life, L <sub>10</sub> , is the fatigue life that 90% of a sufficiently large group of apparently identical bearings, operating under identical operating conditions, can be expected to attain or exceed.	Remember	CO1	AME015.02
7	What is square bearing?	When the length of the journal (l) is equal to the diameter of the journal (d), then the bearing is called square bearing.	Understand	CO1	AME015.02
8	Why do bearings fail?	Pitting or cratering of a bearing is caused by relatively large charges of electricity. ... Electrical damage will cause early spalling and results in a noisy bearing which will have to be replaced. Improper Bearing Lubrication: Lack of or improper lubrication generally causes overheating or excessive wear in the bearing.	Remember	CO1	AME015.02
9	What causes main bearing failure?	Misalignment of main bearing bores can be caused by crankcase distortion or improper machining tolerances. ... Oil starvation or insufficient lubrication is one of the most severe forms of bearing failure.	Understand	CO1	AME015.02
10	Define Minimum oil film thickness	It is the minimum distance between the bearing and the journal, under complete lubrication condition. It is denoted by h <sub>0</sub> . Its value may be assumed as c / 4.	Remember	CO1	AME015.02
11	Define Short and long bearing	If the ratio of the length to the diameter of the journal (i.e. l / d) is less than 1, then the bearing is said to be short bearing. On the other hand, if l / d is greater than 1, then the bearing is known as long bearing.	Remember	CO1	AME015.02
12	Define the term "ZN / p"	The factor ZN / p is termed as bearing characteristic number and is a dimensionless number. The variation of coefficient of friction with the operating values of bearing characteristic number (ZN / p) as obtained by McKee brothers (S.A. McKee and T.R. McKee) The factor ZN/p helps to predict the performance of a bearing	Remember	CO1	AME015.02
13	What is Petroff's law?	Petroff's method of lubrication analysis,	Understand	CO1	AME015.02

S.No	QUESTION	ANSWER	Blooms Level	CO	CLOCODE
		which assumes a concentric shaft and bearing, was the first to explain the phenomenon of bearing friction. This method, which ultimately produces the equation known as Petroff's Law, is useful because it defines groups of relevant dimensionless parameters, and predicts a fairly accurate coefficient of friction, even when the shaft is not concentric.			
14	What Is The Value Of Coefficient Of Friction For Ball Bearing?	The Value Of Coefficient Of Friction For Ball Bearing is 0.1 to 0.25.	Understand	CO1	AME015.02
15	Why Belts Are Subject To Creep?	Due to uneven extension and contraction of belt.	Remember	CO1	AME015.02
16	In Which Type Of Lubrication System The Starting Friction Is Low?	In Hydrostatic lubrication starting friction is low.	Remember	CO1	AME015.03
17	What are the Types of Rolling Contact Bearings?	Following are the two types of rolling contact bearings: 1. Ball bearings; and 2. Roller bearings.	Understand	CO1	AME015.03
18	What is Double row bearing?	A double row bearing is These bearings may be made with radial or angular contact between the balls and races. The double row bearing is appreciably narrower than two single row bearings. The load capacity of such bearings is slightly less than twice that of a single row bearing.	Understand	CO1	AME015.03
19	Write an equation of basic static radial load rating for radial ball bearings.	For radial ball bearings, the basic static radial load rating ( $C_0$ ) is given by $C_0 = f_0 \cdot i \cdot Z \cdot D^2 \cos \langle$ where $i$ = Number of rows of balls in any one bearing, $Z$ = Number of ball per row, $D$ = Diameter of balls, in mm, $\langle$ = Nominal angle of contact <i>i.e.</i> the nominal angle between the line of action of the ball load and a plane perpendicular to the axis of bearing, and $f_0$ = A factor depending upon the type of bearing. The value of factor ( $f_0$ ) for bearings made of hardened steel are taken as follows : $f_0 = 3.33$ , for self-aligning ball bearings $= 12.3$ , for radial contact and angular contact groove ball bearings.	Remember	CO1	AME015.03
20	How do you calculate Static Equivalent Load for Rolling Contact Bearings	The static equivalent radial load ( $W_{0R}$ ) for radial or roller bearings under combined radial and axial or thrust loads is given by the greater magnitude of those obtained by the following two equations, <i>i.e.</i> 1. $W_{0R} = X_0 \cdot W_R + Y_0 \cdot W_A$ ; and 2. $W_{0R} = W_R$	Understand	CO1	AME015.04

S.No	QUESTION	ANSWER	Blooms Level	CO	CLOCODE
		where $W_R$ = Radial load, $W_A$ = Axial or thrust load, $X_0$ = Radial load factor, and $Y_0$ = Axial or thrust load factor.			
21	What is the formula used to calculate oil-film thickness in hydrodynamic bearings?	Oil-film thickness in hydrodynamic bearings. $h = c (1 + C \cos \theta)$	Understand	CO1	AME015.04
22	Define thrust bearing	Thrust bearing supports load acting along axis of shaft.	Remember	CO1	AME015.04
23	What are the functions of bearing?	The following are functions of bearings a) Ensure free rotation of shaft with minimum friction b) Holding shaft in a correct position c) Transmit the force of the shaft to the frame	Understand	CO1	AME015.04
<b>UNIT-II DESIGN OF IC ENGINE PARTS</b>					
1	What are the Principal Parts of an Engine?	The principal parts of an I.C engine, are as follows : 1. Cylinder and cylinder liner, 2. Piston, piston rings and piston pin or gudgeon pin, 3. Connecting rod with small and big end bearing, 4. Crank crankshaft and crank pin, and 5. Valve gear mechanism.	Understand	CO2	AME015.05
2	What is the function Cylinder?	The function of a cylinder is to retain the working fluid and to guide the piston. The cylinders are usually made of cast iron or cast steel. Since the cylinder has to withstand high temperature due to The combustion of fuel, therefore, some arrangement must be provided to cool the cylinder.	Understand	CO2	AME015.05
3	What is an IC engine and how does it work?	In a spark ignition engine, the fuel is mixed with air and then inducted into the cylinder during the intake process. After the piston compresses the fuel-air mixture, the spark ignites it, causing combustion. The expansion of the combustion gases pushes the piston during the power stroke.	Understand	CO2	AME015.05
4	Define Stroke	The distance travelled by the piston from TDC to BDC is called stroke. In other words, the maximum distance travelled by the piston in the cylinder in one direction is known as stroke. It is equal to twice the radius of the crank.	Remember	CO2	AME015.05
5	Define swept volume	The volume swept by the piston during one stroke is called the swept volume or piston displacement. Swept volume is the volume covered by the piston while moving from TDC to BDC. Swept volume = $V_s = A \times L = D^2 L 4 \Pi$ where $A$ = Cross sectional area of the piston in Sq.m, $L$ = Stroke in m, and $D$ = Cylinder bore i.e., inner diameter of the cylinder	Remember	CO2	AME015.06

S.No	QUESTION	ANSWER	Blooms Level	CO	CLOCODE
		in m.			
6	Define Compression ratio	Compression ratio is a ratio of the volume when the piston is at bottom dead centre to the volume when the piston is at top dead centre. The compression ratio varies from 5: 1 to 10 : 1 for petrol engines and from 12:1 to 22 : 1 for diesel engines.	Remember	CO2	AME015.07
7	What is the function of piston?	It is the main active part of the engine. It is cylindrical in construction and slides tip and down inside the cylinder. It has piston rings to provide good seal between the cylinder wall and the piston. There are three grooves to accommodate piston rings. Function: (i) To compress the fresh charge during the compression stroke. (ii) To transmit the force exerted due to combustion of the charge to the connecting rod finally to the crankshaft during the power stroke.	Understand	CO2	AME015.08
8	What is the material of piston	Material: Aluminium alloy cast steel, cast iron and chrome nickel	Understand	CO2	AME015.09
9	What is the function of piston Rings and material?	Piston Rings: Piston rings are fitted into the grooves of the piston to maintain good seal between the piston and the cylinder walls. There are two types of pistons rings. Upper rings are called compression rings and the lower rings are called oil rings. Function: Compression rings are used to provide gas tight sealing to prevent leakage of the lubricating oil into the engine cylinder. The oil rings, also called as scrapper rings are used to scrap the used lubricating oil into the crank case. Material: Alloy cast iron containing silicon, manganese, alloy steels, etc	Understand	CO2	AME015.09
10	What is the function of connecting and material?	Connecting Rod: The connecting rod interconnects the piston to the crankshaft. The upper end of the connecting rod is fitted to the piston and lower end to the crankshaft. Function: (i) It transmits the power produced in the cylinder to the crankshaft. (ii) It converts the reciprocating motion of the piston into rotary motion of tile crankshaft. Material: Medium carbon steel and alloy steel.	Understand	CO2	AME015.09
11	What is the function of Crank and Crankshaft?	Crank and Crankshaft: The crank is a lever that is connected to the end of the connecting rod by a pin joint with its other end connected rigidly to a shaft, called crankshaft. The crankshaft is the principle rotating part of the engine. The crankshaft is provided with suitable holes to help in the lubrication system. Function: It converts the reciprocating motion of the piston into useful rotary motion of the Output Shaft. Material:	Understand	CO2	AME015.10

S.No	QUESTION	ANSWER	Blooms Level	CO	CLOCODE
		Forged steel.			
12	Why connecting rods are made of I sections?	The axial stresses are produced due to cylinder gas pressure (compressive only) and the inertia force arising in account of reciprocating action (both tensile and compressive), whereas bending stresses are caused due to the centrifugal effects. The connecting rods are made traditionally with I cross section	Understand	CO2	AME015.11
13	Explain whipping stress in connecting rod	The parallel (or longitudinal) components add up algebraically to the force acting on the connecting rod (FC) and produces thrust on the pins. The perpendicular (or transverse) components produces bending action (also called whipping action) and the stresses induced in the connecting rod is called whipping stress.	Understand	CO2	AME015.12
14	Write the formulas for design of piston crown thickness on the basis of strength as well as heat dissipation?	Thickness of Piston Head (tH) : The piston thickness of piston head calculated using the following Grashoff's formula, $tH = D \sqrt{(3p) / (16\sigma)}$ in mm P= maximum pressure in N/mm <sup>2</sup> . D= cylinder bore/outside diameter of the piston in mm= 80mm. $\sigma$ =permissible tensile stress for the material of the piston. $H = 12.56 * tH * k * (Tc - Te)$ KJ/sec Where k=thermal conductivity of material Tc = temperature at center of piston head in °C. Te = temperature at edges of piston head in °C. (Tc-Te)=75°C for Aluminium alloy.	Understand	CO2	AME015.13
15	What are the forces acting on the connecting rod?	The various forces acting on the connecting rod are as follows: 1. Forces on the piston due to gas pressure and inertia of the reciprocating parts. 2. Forces on the piston due to gas pressure and inertia of the reciprocating parts.	Understand	CO2	AME015.13
16	What is crankshaft material?	The crankshaft is designed to convert the up and down motion of the pistons into horizontal rotation. The shaft is one solid piece made from cast iron or forged steel. Steel is usually used in high loading situations, such as diesel or turbocharged engines.	Understand	CO2	AME015.14
17	What process is used to make a crankshaft?	Crankshafts are also used in driven machinery such as air compressors and reciprocating pumps. The industrial potential for a new crankshaft manufacturing process is huge, as the existing and common methods, forging casting and machining are very costly.	Understand	CO2	AME015.15
18	What is a forged	There are a couple of different ways to	Understand	CO2	AME015.15

S.No	QUESTION	ANSWER	Blooms Level	CO	CLOCODE
	crankshaft?	arrive at the basic shape, and this forms the basis of whether the crank is a forged or cast piece. In casting, a mold is made and molten crank material, usually cast iron, is simply poured in to create the raw casting.			
19	What is the material of Camshaft gear is made from which material?	Camshaft gears are made from Bakelite.	Understand	CO2	AME015.15
20	What are The main reasons for crankshaft wear?	The main reasons for crankshaft wear are a) Different loads at some points of rotation b) Centrifugal forces due to crankshaft rotation c) Misalignment in connecting rod	Understand	CO2	AME015.15
<b>UNIT-III POWER TRANSMISSION SYSTEMS AND PULLEYS</b>					
1	What are the different types of belts	There are three basic types of power transmission belting: flat, V, and synchronous. Misalignment is a common cause of premature belt failure.	Understand	CO3	AME015.16
2	What is the material used for power transmission.	The fibers may be of textile materials such as cotton, polyamide (such as Nylon) or polyester or, for greatest strength, of steel.	Understand	CO3	AME015.16
3	Write down the various important parameters necessary for the selection of a particular drive for power transmission.	Following are the various important factors upon which the selection of a belt drive depends: 1. Speed of the driving and driven shafts, 2. Speed reduction ratio, 3. Power to be transmitted, 4. Centre distance between the shafts, 5. Positive drive requirements, 6. Shafts layout, 7. Space available 8. Service conditions.	Remember	CO3	AME015.16
4	What are the factors upon which the coefficient of friction between the belt and the pulley depends?	The coefficient of friction between the belt and the pulley depends upon the following factors: i) The material of belt; ii) The material of pulley; iii) The slip of belt; and iv) The speed of belt.	Understand	CO3	AME015.17
5	How are ends of belts joined?	When the endless belts are not available, then the belts are cut from big rolls and the ends are joined together by fasteners. The various types of joints are 1. Cemented joint, 2. Laced joint, and 3. Hinged joint.	Understand	CO3	AME015.18
6	What is The effect of centrifugal tension in the belt?	Because of centrifugal force tension on both side will be increased but at the same time normal reaction force in between belt and pulley surface will go down so frictional tension will be decrease and ultimately power	Understand	CO3	AME015.19

S.No	QUESTION	ANSWER	Blooms Level	CO	CLOCODE
		transmission efficiency will decrease. The belt continuously runs over both the pulleys.			
7	What are the three types of pulleys?	There are three main types of pulleys: fixed, movable, and compound. A fixed pulley's wheel and axle stay in one place. A good example of a fixed pulley is a flag pole: When you pull down on the rope, the direction of force is redirected by the pulley, and you raise the flag.	Understand	CO3	AME015.20
8	What is meant by power transmission?	Power transmission is the movement of energy from its place of generation to a location where it is applied to perform useful work. Power is defined formally as units of energy per unit time.	Understand	CO3	AME015.16
9	What are the different modes of transmitting power from one shaft to another?	Power transmission is a process to transmit motion from one shaft to another by using some connection between them like belt, rope, chain, and gears. To connect the shafts, mainly two types of connectors are used, one is flexible and other is rigid.	Understand	CO3	AME015.17
10	What is positive and negative drive?	Positive drive means movement without slip such as the case in the linking between the crankshaft and the camshaft in the reciprocating engine. Negative drive, is an unusual term, allows slippage as with belt drive. Gears are said to be "POSITIVE DRIVE" because there is no slippage between the input and output.	Understand	CO3	AME015.18
11	What is angle of lap?	Angle of lap on the smaller pulley, the idler pulley is used. The angle of lap may be defined as the angle of contact between the belt and the pulley. With the increase in angle of lap, the belt drive can transmit more power.	Understand	CO3	AME015.19
12	What is angle of wrap?	In the crossed belt configuration, the pulleys tend to rotate in opposite directions, and both pulleys have the same wrap angle. Belt Drive Schematics. In the open configuration, the wrap angle of the belt around each pulley is given by the expressions: $\theta_A$ is the wrap angle of pulley A. $\theta_B$ is the wrap angle of pulley B.	Understand	CO3	AME015.20
13	What is the angle of v belt?	The included angle of the V-Belts is 40 Degrees. Here's is a brief outline on the power transmitting capacity of the each section type of the belt.	Understand	CO3	AME015.16
14	Why is a crown pulley done?	These flat belts stayed centered on pulleys without any guides or flanges. The key to keeping them tracking centered on the pulleys is the use of "crowned pulleys". A crowned pulley is a pulley that has a slight hump in the middle, tapering off ever so slightly towards either edge.	Understand	CO3	AME015.17



S.No	QUESTION	ANSWER	Blooms Level	CO	CLOCODE
15	Why belt drives are called flexible drives?	A belt is a loop of flexible material used to link two or more rotating shafts mechanically, most often parallel. Belts may be used as a source of motion, to transmit power efficiently or to track relative movement.	Understand	CO3	AME015.18
16	Why would you use a belt drive instead of a chain?	Well, generally both are used for power transmission. These are often used in Vehicles and Mechanical Applications. The chain drive contains sprocket on both sides linked by chain to transmit the power whereas belt drive includes pulleys or shafts on both sides, linked by synthetic belt to transmit the power.	Understand	CO3	AME015.18
17	Why are V belts used?	Round belts. Round belts are a circular cross section belt designed to run in a pulley with a 60 degree V-groove. Round grooves are only suitable for idler pulleys that guide the belt, or when (soft) O-ring type belts are used. The V-groove transmits torque through a wedging action, thus increasing friction.	Understand	CO3	AME015.18
18	What is belt pitch length?	Timing belt pitch is the distance in millimeters and/or inches between two adjacent tooth centers as measured on the pitch line of the timing belt. Pitch (Timing Belt Pulley Pitch) Timing belt pitch is the distance in millimeters between two adjacent tooth centers as measured on the pitch line of the timing belt.	Understand	CO3	AME015.19
19	What is purpose of idler pulley?	Idler pulleys are engine pulleys that are responsible for guiding and tensioning the engine drive belts. The engine drive belts are routed in a specific manner around the various engine accessories, such as the alternator, water pump, <b>power</b> steering pump, and AC compressor.	Remember	CO3	AME015.20
20	What is datum length?	Belt length is determined in a datum or effective system. For this reason the datum or effective diameters are determined first for each pulley. The belt trajectory is based on individual pulley position. The sliding pulley position is adjusted to accomplish standard belt length criteria.	Remember	CO3	AME015.20
21	Why Belts Are Subject To Creep?	Due to uneven extension and contraction of belt creep will be setup in the belt.	Remember	CO3	AME015.20
<b>UNIT-IV DESIGN OF GEARS</b>					
S.No	QUESTION	ANSWER	Blooms Level	CLO	CLO Code
1	Define pitch circle	A circle radius of which is equal to the distance from the gear axis to the pitch point. It is the imaginary circle that rolls without slipping with a pitch circle of a	Remember	CO4	AME015.15

S.No	QUESTION	ANSWER	Blooms Level	CO	CLOCODE
		mating gear. These are the outlines off the imaginary smooth roller or friction discs in every pair of mating gears.			
2	Define pitch point	It is the point of tangency of the two pitch circles or a pitch circle and a pitch line. It lies on the line of centers	Remember	CO4	AME015.16
3	Define circular pitch	It is the distance measured on the pitch circle from a point on one tooth to a corresponding point on the next tooth	Remember	CO4	AME015.17
4	Define module	It is the ratio of the pitch circle diameter to the number of teeth. Module =D/T	Remember	CO4	AME015.18
5	Define diametral pitch	It is the number of teeth on the gear per unit of the pitch circle diameter. Pc= T/D	Remember	CO4	AME015.19
6	Define Dedendum circle	It is the circle drawn through the bottom of the teeth and is concentric with the pitch circle. Dedendum circle. Addendum Circle and Root Circle).It is also called root circle.	Remember	CO4	AME015.20
7	Define backlash	It is the amount by which the width of a tooth space exceeds the thickness of the engaging tooth on the pitch circles. Backlash= Tooth space –Tooth thickness	Remember	CO4	AME015.16
8	What is flank?	It is the surface of the bottom tooth between adjacent fillets.	Understand	CO4	AME015.17
9	Define pressure angle	The pressure angle exists between the tooth profile and a radial line to its pitch point. In involute teeth, it is defined as the angle formed by the radial line and the line tangent to the profile at the pitch point.	Remember	CO4	AME015.18
10	Define gear ratio	The ratio of the number of teeth on gear to that on the pinion is known as a gear ratio. Gear Ratio= T/t.	Remember	CO4	AME015.19
11	What is law of gearing?	It states that the common normal at the point of contact always passes through pitch point	Understand	CO4	AME015.20
12	Name different forms of gear teeth	i) Involute teeth. (ii) Cycloidal teeth.	Remember	CO4	AME015.04
13	which relation is used to obtain minimum number of teeth in order to avoid interference with wheel	Minimum number of teeth $= 2 A_w / [ \sqrt{(1 + 3 \sin^2 \Phi)} ] - 1$ where $A_w$ = addendum coefficient of wheel	Remember	CO4	AME015.04
14	What is meant by interference?	Mating of non-involute profiles of a tooth leads to interference.	Understand	CO4	AME015.04
15	What is the formulae of velocity factor (K) is considered if helical gears of medium accuracy are manufactured by hobbing process followed by shaving?	Velocity factor $K = 5.6 / (5.6 + \sqrt{V})$	Understand	CO4	AME015.04
16	Define worm gears	if the axes of two shafts are neither intersecting nor parallel gears are called worm gears	Remember	CO4	AME015.04

S.No	QUESTION	ANSWER	Blooms Level	CO	CLOCODE
17	What is Crowing of gear tooth?	In this process, tooth ends are made thinner. This process is called crowing of gears.	Understand	CO4	AME015.04
18	Define crossed helical gears	Helical gears mounted on parallel shafts are called crossed helical gears.	Remember	CO4	AME015.04
19	Define External bevel gear	When the pitch angle is less than $90^{\circ}$ , it is called external bevel gear	Remember	CO4	AME015.04
20	Define Crown bevel gear	Crown gears are characterized by pitch angle of $90^{\circ}$ . For crown bevel gear, pitch angle is $90^{\circ}$ .	Remember	CO4	AME015.04
<b>UNIT-V DESIGN OF POWER SCREWS</b>					
1	What is self locking of power screw?	Efficiency of a power screw and condition for self locking. 6.1.1 Introduction. A power screw is a drive used in machinery to convert a rotary motion into. a linear motion for power transmission.	Understand	CO5	AME015.21
2	How does screw work?	Machines that use screws to push against other objects are called presses. A press is used to make cider or wine by squashing fruit to extract the juice from it. Printing presses were also used to make books. The up and down force generated by a screw can also be used to hold things together.	Understand	CO5	AME015.22
3	Which type of thread is used for power screws?	lead screw has square thread because it has the highest power transmission capacity without any backlash and minimum friction. but as the square thread are costly to machine, acme threads are used as an alternative in many application.	Remember	CO5	AME015.23
4	Why are V threads not used in power screws?	Power screws are classified by the geometry of their thread. V-threads are less suitable for lead screws than others such as ACME because they have more friction between the threads. Their threads are designed to induce this friction to keep the fastener from loosening.	Understand	CO5	AME015.24
5	What are examples of screws?	A screw can also act to hold things together in some cases. Some examples of the uses of a screw are in a jar lid, a drill, a bolt, a light bulb, faucets, bottle caps and ball point pens. Circular stairways are also a form of a screw.	Remember	CO5	AME015.25
6	What is the principle of screw?	A screw is a mechanism that converts rotational motion to linear motion, and a torque (rotational force) to a linear force. It is one of the six classical simple machines. The most common form consists of a cylindrical shaft with helical grooves or ridges called threads around the outside.	Understand	CO5	AME015.21
7	Which type of thread is more effective for power transmission in one direction?	Buttress thread is used to transmit power in a single direction. It has advantages of both a square thread (Low friction resistance) and V thread (strength).	Understand	CO5	AME015.22
8	Why square threads are used in screw jack?	The large area of sliding contact between the screw threads means jackscrews have high friction and low efficiency as power transmission linkages, around 30%–50%. In heavy-duty applications, such as screw jacks, a square thread or buttress thread is used, because it has the lowest friction and wear.	Remember	CO5	AME015.23
9	What is the lead of a screw?	Lead is the axial advance of a helix or screw during one complete turn ( $360^{\circ}$ ) The lead for a screw thread is the axial travel for a single revolution. Pitch is defined as the	Understand	CO5	AME015.24

S.No	QUESTION	ANSWER	Blooms Level	CO	CLOCODE
		axial distance between adjacent threads on a helix or screw.			
10	What is the function of screw jack?	A jackscrew, or screw jack, is a type of jack that is operated by turning a lead screw. It is commonly used to lift moderately heavy weights, such as vehicles; to raise and lower the horizontal stabilizers of aircraft; and an adjustable supports for heavy loads, such as the foundations of houses.	Understand	CO5	AME015.25
11	What is Acme threaded rod?	Trapezoidal thread forms screw thread profiles with trapezoidal outlines. They are the most common forms used for lead screws (power screws). They offer high strength and ease of manufacture. They are typically found where large loads are required, as in a vise or the lead screw of a lathe.	Remember	CO5	AME015.21
12	How do screw threads work?	To effectively service fasteners, it is important to have a working knowledge of screw threads. A thread is a continuous helical ridge formed on the inside (nut) or outside (screw) of a cylinder. ... Threads are set at an angle to the axis of the bolt or nut.	Understand	CO5	AME015.22
13	What are ball screws used for?	A ball screw is a mechanical linear actuator that translates rotational motion to linear motion with little friction. A threaded shaft provides a helical raceway for ball bearings which act as a precision screw.	Remember	CO5	AME015.23
14	What is multi start thread?	A multi-start thread consists of two or more intertwined threads running parallel to one another. Intertwining threads allow the lead distance of a thread to be increased without changing its pitch. ... This allows multi-start threads to maintain a shallow thread depth relative to their longer lead distance.	Understand	CO5	AME015.24
15	What is the difference between coarse and fine thread?	Size for size a fine thread is stronger than a coarse thread. This is both in tension (because of the larger stress area) and shear (because of their larger minor diameter). ... Fine threads have less tendency to loosen since the thread incline is smaller and hence so is the off torque.	Understand	CO5	AME015.25
16	What is nominal thread size?	In manufacturing, a nominal size or trade size is a size "in name only" used for identification. The nominal size may not match any dimension of the product, but within the domain of that product the nominal size may correspond to a large number of highly standardized dimensions and tolerances.	Understand	CO5	AME015.21
17	What is ball screw in CNC machine?	A ball screw is a mechanical linear actuator that translates rotational motion to linear motion with little friction. A threaded shaft provides a helical raceway for ball bearings which act as a precision screw.	Understand	CO5	AME015.22
18	Define lead.	The distance a screw thread advances axially in one turn is called lead	Remember	CO5	AME015.23
19	Define Series of thread.	The standard number of threads per inch for various diameters is the Series of thread	Remember	CO5	AME015.24
20	Define Pitch.	Pitch is defined as the axial distance between adjacent threads on a helix or screw.	Remember	CO5	AME015.25

Signature of the Faculty

Signature of HOD