



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad-500043

FRESHMAN ENGINEERING

TUTORIAL QUESTION BANK

Course Name	:	Applied Physics
Course Code	:	AHS007
Class	:	B. Tech I Semester
Branch	:	Common for AE/ ME/ CE
Academic Year	:	2017 - 2018
Course Coordinator	:	Dr.Rizwana, Professor
Course Faculty	:	Dr.A Jayanth Kumar, Professor Dr.Rizwana, Professor

COURSE OBJECTIVES (COs):

The course should enable the students to:

I	Develop the strong fundamentals of system of forces and friction.
II	Strengthen the knowledge of theoretical and technological aspects of dynamics of rigid bodies.
III	Correlate the principles with applications of the dielectric and magnetic materials.
IV	Enrich the knowledge in acoustics and ultrasonics.

COURSE LEARNING OUTCOMES (CLOs):

Students, who complete the course, will have demonstrated the asking to do the following:

CAHS007.01	Recall the basic principles of physics and exploit the rules of physics for many technological applications.
CAHS007.02	Solving real-time problems by applying basic concepts and principles of physics.
CAHS007.03	Acquire knowledge of basic terms related to dielectric materials and different polarization mechanisms.
CAHS007.04	Review properties of different magnetic materials and magnetization based on orientation of domains.
CAHS007.05	Recollect basic principles of acoustics of buildings and modern architectural acoustic techniques.
CAHS007.06	Explain production, properties and different applications of ultrasonic waves.
CAHS007.07	Review the basic concepts of system of forces and discuss in detail resolution and resultant of forces.
CAHS007.08	Analyze different laws of forces under various conditions and also to study conditions for equilibrium.
CAHS007.09	Discuss importance of friction in day to day life, also different types and laws of friction.
CAHS007.10	Interpret applications of ladder friction, wedge friction and screw friction in real-life situations.
CAHS007.11	Describe rotational motion of rigid bodies and moment of inertia of some of the regular shapes.

CAHS007.12	Identify the situations where parallel and perpendicular axis theorems of moment of inertia are applied.
CAHS007.13	Apply theorems of moment of inertia to calculate moment of inertia of rectangular lamina, circular disc, thin rod and complex shapes.
CAHS007.14	Understand the importance of dynamics of rigid bodies in engineering and technology in the real-world situations.
CAHS007.15	Remember quantitative analysis of forces, friction and moment of inertia and recollect it whenever required in real-time situations.
CAHS007.16	Understand the concept and acquire knowledge for attempting competitive exams.

TUTORIAL QUESTION BANK

UNIT - I			
DIELECTRIC AND MAGNETIC PROPERTIES			
Part - A (Short Answer Questions)			
S No	QUESTION	Blooms Taxonomy Level	Course Learning Outcomes (CLOs)
1	What do you understand by dielectric constant and electric polarization related to a dielectric material?	Understand	CAHS007.01 CAHS007.03
2	Explain the terms and write the relation for displacement vector and electric susceptibility.	Understand	CAHS007.01 CAHS007.03
3	Describe polarization vector and polarizability of a dielectric material when placed in external electric field.	Understand	CAHS007.01 CAHS007.03
4	Write notes on electric dipole and electric dipole moment associated with dielectric materials.	Remember	CAHS007.01 CAHS007.03
5	Mention different types of polarizations that occur in dielectric materials in the presence of external electric field.	Remember	CAHS007.01 CAHS007.03
6	When an electric field is applied, how does the phenomenon of polarization take place?	Understand	CAHS007.01 CAHS007.03
7	Describe electronic polarization that occurs in atoms when dielectric material is subjected to external field.	Understand	CAHS007.01 CAHS007.03
8	Explain the phenomenon of ionic polarization in dielectrics.	Understand	CAHS007.01 CAHS007.03
9	Describe mechanism of orientation polarization due to application of electric field.	Understand	CAHS007.01 CAHS007.03
10	Discuss the concept of internal field at a point inside the solid dielectric material.	Understand	CAHS007.01 CAHS007.03
11	Write an expression for local field in a dielectric material subjected to external field E.	Remember	CAHS007.01 CAHS007.03
12	What do you understand by magnetic induction and magnetic susceptibility with reference to magnetism?	Understand	CAHS007.01 CAHS007.04
13	Explain the terms: i. Magnetic field intensity ii. Permeability	Understand	CAHS007.01 CAHS007.04
14	Write notes on relative permeability and magnetic moment related to magnetic material.	Remember	CAHS007.01 CAHS007.04
15	Explain the phenomenon of magnetization that takes place in a magnetic material under the influence of magnetic field intensity.	Understand	CAHS007.01 CAHS007.04
16	Discuss about Bohr magneton related to magnetic moment of electron.	Understand	CAHS007.01 CAHS007.04

17	Mention the types of magnetic materials based on electron spins.	Remember	CAHS007.01 CAHS007.04
18	Sketch and label the hysteresis loop observed in ferromagnetic materials.	Remember	CAHS007.01 CAHS007.04
19	Define retentivity associated with ferromagnetic material.	Remember	CAHS007.01 CAHS007.04
20	Explain coercivity related to hysteresis loop of a ferromagnetic material?	Understand	CAHS007.01 CAHS007.04
Part - B (Long Answer Questions)			
1	On application of external electric field, various polarization processes takes place in dielectric material. Explain briefly all these polarization processes and write a relation for total polarization.	Understand	CAHS007.01 CAHS007.03
2	What is electronic polarization? Derive an expression for electronic polarizability in terms of the radius of the atom.	Understand	CAHS007.01 CAHS007.03
3	Show that the ionic polarizability occurring in ionic solids is inversely proportional to square of angular frequency (ω_0) and directly proportional to reduced mass.	Remember	CAHS007.01 CAHS007.03
4	Obtain an expression for the internal field experienced by an atom inside a dielectric material subjected to an external field by using Lorentz method.	Understand	CAHS007.01 CAHS007.03
5	Describe the origin of magnetic moment and find the magnetic dipole moments due to orbital and spin motions of an electron.	Understand	CAHS007.01 CAHS007.04
6	How would you differentiate dia, para and ferromagnetic substances based on their magnetic behaviour?	Understand	CAHS007.01 CAHS007.04
7	Discuss the magnetization of ferromagnetic material by domain wall movement and rotation of domains based on domain theory of ferromagnetism.	Understand	CAHS007.01 CAHS007.04
8	Draw the hysteresis loop for a ferromagnetic material and explain the loop based on various stages of magnetization starting from virgin magnetic material.	Understand	CAHS007.01 CAHS007.04
Part - C (Analytical Questions)			
1	A parallel plate capacitor having a plate separation of 2×10^{-3} m across which a potential of 10 V is applied. Calculate the dielectric displacement, when a material of dielectric constant 6.0 is introduced between the plates.	Understand	CAHS007.02 CAHS007.03
2	A parallel capacitor has an area of 100cm^2 , a plate separation of 1 cm and is charged to a potential of 100 Volts. Calculate the capacitance of the capacitor and the charge on the plates.	Understand	CAHS007.02 CAHS007.03
3	The dielectric constant of He gas is 1.0000684. Find the electronic polarizability of He atoms if the gas contains 2.7×10^{25} atoms per m^3 .	Understand	CAHS007.02 CAHS007.03
4	A solid dielectric with density 3×10^{28} atoms / m^3 shows an electronic polarizability of 10^{-40} farad $\cdot \text{m}^2$. Assuming the internal electric field to be a Lorentz field, calculate the dielectric constant of the material.	Understand	CAHS007.02 CAHS007.03
5	A parallel capacitor of area 650mm^2 and a plate separation of 4 mm has a charge of 2×10^{-10} C on it. When a material of dielectric constant 3.5 is introduced between the plates, what is the resultant voltage across the capacitors?	Understand	CAHS007.02 CAHS007.03
6	Calculate magnetization and magnetic flux density if magnetic field intensity 250A/m and relative permeability is 15.	Understand	CAHS007.02 CAHS007.04
7	Find permeability of a substance, if $H=220 \text{ A/m}$ and $M=3300 \text{ A/m}$.	Understand	CAHS007.02

			CAHS007.04
8	The magnetic susceptibility of aluminium is 2.3×10^{-5} . Find its permeability and relative permeability.	Understand	CAHS007.02 CAHS007.04
9	If a magnetic field of strength 300 A/m produces a magnetization of 4200 A/m in a ferromagnetic material, find the permeability of the material.	Understand	CAHS007.02 CAHS007.04
10	A paramagnetic material has a magnetic field intensity of 10^4 A/m. If the susceptibility of the material at room temperature is 3.7×10^{-3} , calculate the magnetization and magnetic flux density in the material.	Understand	CAHS007.02 CAHS007.04

UNIT - II

ACOUSTICS AND ULTRASONICS

Part – A (Short Answer Questions)

1	Define the term Reverberation. What is Reverberation time?	Remember	CAHS007.05
2	Explain Sabine's formula for reverberation time of an auditorium.	Understand	CAHS007.05
3	What are ultrasonic waves? Discuss any two properties of ultrasonic waves.	Understand	CAHS007.06
4	Define magnetostriction effect that can be used for the production of ultrasonic waves.	Remember	CAHS007.06
5	Define piezo-electric effect that can be used for the production of ultrasonic waves.	Remember	CAHS007.06
6	What is SONAR? Mention any two of its applications.	Understand	CAHS007.06
7	Which method is suitable to produce high frequency in order 1×10^8 Hz.	Understand	CAHS007.06
8	Write the relation between natural frequency 'f', young's modulus 'Y', density of material 'ρ' and length of the rod 'L'.	Remember	CAHS007.06
9	List out the merits and demerits of magnetostriction method used in the production of ultrasonic waves.	Remember	CAHS007.06
10	List out the merits and demerits of piezo-electric method used in the production of ultrasonic waves.	Remember	CAHS007.06

Part - B (Long Answer Questions)

1	What is an acoustically good hall? Explain the basic requirements of an acoustically good hall.	Understand	CAHS007.05
2	Describe an experimental method to determine the sound absorption coefficient of a material.	Understand	CAHS007.05
3	Discuss the factors which are affecting the architectural acoustics and suggest your remedy.	Understand	CAHS007.05
4	Explain experimental method of producing ultrasonic waves by using magnetostriction effect with a neat diagram.	Understand	CAHS007.06
5	Explain experimental method of producing ultrasonic waves by using piezoelectric effect with a neat diagram.	Understand	CAHS007.06
6	Describe the method of determining the depth of sea using SONAR.	Understand	CAHS007.06
7	Describe the applications of ultrasonic waves in different fields of science and technology.	Understand	CAHS007.06

Part - C (Analytical Questions)

1	A hall of volume 85000 m^3 is found to have a reverberation time of 2.2 sec. If the area of the sound absorbing surface is 7500 m^2 , calculate average sound absorption coefficient.	Understand	CAHS007.02 CAHS007.05
2	A hall has a volume of 12500 m^3 and reverberation time of 1.5 sec. If	Understand	CAHS007.02

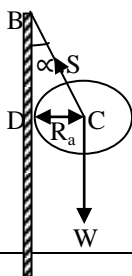
	200 cushioned chairs are additionally placed in the hall, What will be the new reverberation time of the hall. The absorption of each chair is 1.0 OWU.		CAHS007.05
3	The volume of a hall is 475m^3 . The area of wall is 200m^2 , area of floor and ceiling each is 100m^2 . If absorption coefficient of the wall, ceiling and floor are 0.025, 0.02 and 0.55 respectively, calculate the reverberation time for the hall.	Understand	CAHS007.02 CAHS007.05
4	The volume of an auditorium is 9500 cubic meters. The period of reverberation is found to be 1.5 sec. Calculate the total absorption in the auditorium. If the floor of the auditorium is now covered with carpets where the total absorption is found to have increased by 100 sabin, calculate the new period of reverberation.	Understand	CAHS007.02 CAHS007.05
5	A hall has dimensions $20 \times 15 \times 5\text{m}^3$. The reverberation time is 3.5 sec. Calculate the total absorption of its surfaces and the average absorption coefficient.	Understand	CAHS007.02 CAHS007.05
6	A quartz crystal of thickness 0.0001m is vibrating at resonance. Calculate the fundamental frequency when $Y=7.9 \times 10^{10}\text{ N/m}^2$ and $\rho = 2650\text{ Kg/m}^3$.	Understand	CAHS007.02 CAHS007.06
7	A quartz crystal of thickness 0.0001m is vibrating at resonance. Calculate the velocity of ultrasonic wave of $Y=7.9 \times 10^{10}\text{ N/m}^2$ and $\rho = 2650\text{ Kg/m}^3$.	Understand	CAHS007.02 CAHS007.06
8	Calculate the depth of the sea if the time interval between the emitted signal and the echo received is 2 sec in sonar studies. Assume the velocity of sound in sea water as 1490 m/s .	Understand	CAHS007.02 CAHS007.06
9	For a quartz crystal of length 0.05 cm , calculate the fundamental frequency of oscillation if the velocity of waves in the crystal is $5.5 \times 10^3\text{ m/s}$.	Understand	CAHS007.02 CAHS007.06

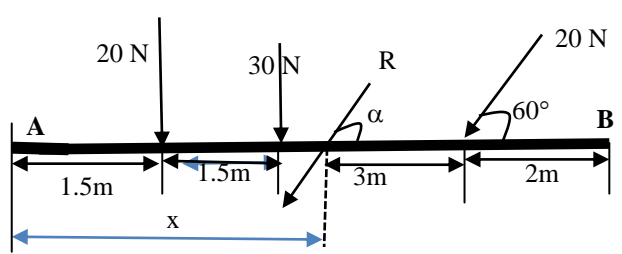
UNIT-III

EQUILIBRIUM OF SYSTEM OF FORCES

Part - A (Short Answer Questions)

1	What do you understand by force exerted on a body? Write its units.	Remember	CAHS007.07
2	Define a rigid body. Differentiate elastic body with respect to rigid body.	Understand	CAHS007.07
3	What are coplanar concurrent forces acting on a body? Explain with a diagram.	Understand	CAHS007.07
4	Explain the condition for equilibrium of concurrent forces in a plane with a diagram.	Understand	CAHS007.08
5	<p>Obtain a relation for α in terms of R_a and W in the following diagram.</p> <p>R_a = Radius of the sphere suspended with a string of tension S.</p> <p>W = Weight of the sphere.</p> <p>BDE is a hard wall.</p>	Understand	CAHS007.08



E			
6	Explain moment of force considering a force P, acting on a thin rod of length L. Write the unit and dimensional formula for force and moment of force.	Understand	CAHS007.08
7	State and explain varignon's theorem with an example. Explain the situation where this theorem is applicable.	Remember	CAHS007.08
8	Two forces A and B are acting on a scale in vertically upward direction and keeps the scale horizontal. Calculate the weight of the scale W.	Remember	CAHS007.08
9	Define couple associated with parallel forces and explain with a diagram.	Remember	CAHS007.08
Part – B (Long Answer Questions)			
1	Obtain a relation for resultant force using parallelogram law of forces, considering two forces P, Q acting at a point with an angle α between them..	Understand	CAHS007.07
2	Explain triangle law of forces, considering three forces P, Q, R acting at a point in equilibrium position.	Understand	CAHS007.07
3	P, Q are two forces acting at a point 'A' with an angle α between them. The resultant R makes an angle β with Q and γ with P. Show that $\frac{\sin\beta}{P} = \frac{\sin\gamma}{Q} = \frac{\sin\alpha}{R} \text{ or } \frac{\sin\beta}{\sin\gamma} = \frac{P}{Q}$	Understand	CAHS007.08
4	State and prove Lami's theorem. Explain the situation where this theorem is applicable.	Remember	CAHS007.07
5	Write different characteristics exhibited by a couple acting on parallel forces in a plane and also discuss any one application of it.	Remember	CAHS007.08
6	A uniform horizontal bar is pivoted at its centre of mass. Two forces A and B at distances x_1 and x_2 of the centre (on either side of the centre) act down wards. What will be the ratio of x_1 to x_2 , if the bar is to remain horizontal? Explain your result.	Understand	CAHS007.08
7	If a force P acts at origin with angles $\theta_x, \theta_y, \theta_z$ with x, y and z axis respectively, resolve the force along x, y and z components. Write moments of force about x, y and z axis. Illustrate with a neat diagram.	Understand	CAHS007.08
8	A system of load is acting on a beam is shown in figure. Calculate resultant force R of the loads. 	Understand	CAHS007.08

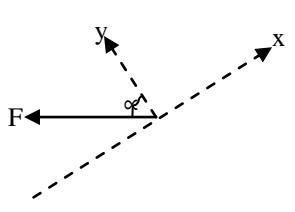
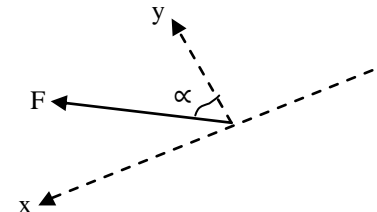
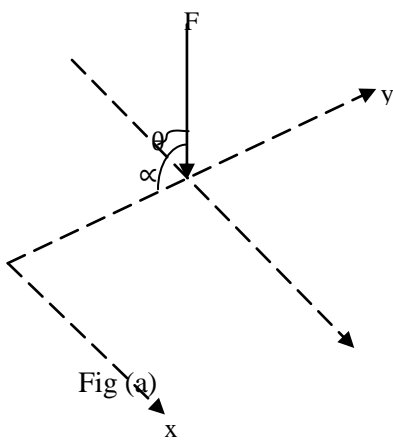
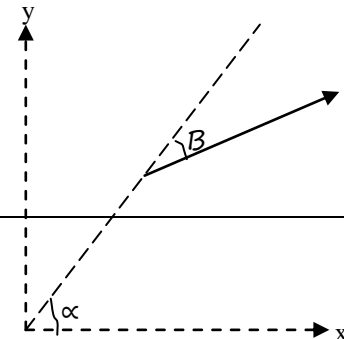
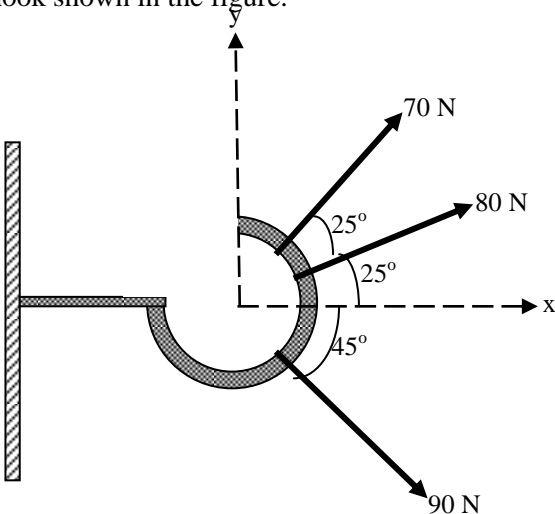
Part - C (Analytical Questions)			
1	If two forces 40 N and 60 N are pulling on a body at an angle θ between them. Obtain an equation for resultant force R. Discuss special cases when $\theta = 0^\circ$, $\theta = 90^\circ$, $\theta = 120^\circ$ and $\theta = 180^\circ$.	Remember	CAHS007.07
2	Determine horizontal force P to be applied on the block of weight 1500 N to hold it in fixed position. The block is placed on a smooth inclined plane of an angle 30° with horizontal.	Understand	CAHS007.07
3	<p>Resolve force F into rectangular components in the following figures.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Fig (a)</p> </div> <div style="text-align: center;">  <p>Fig (b)</p> </div> </div>	Understand	CAHS007.08
4	<p>Resolve force F into rectangular components in the following figures.</p> <div style="display: flex; flex-direction: column; align-items: center;">  <p>Fig (a)</p>  </div>	Understand	CAHS007.08

	Fig (b)		
5	<p>Determine magnitude and direction of resultant of all the three forces on the hook shown in the figure.</p> 	Understand	CAHS007.08
6	A force of 100 N at 60° with horizontal is applied at one end of a horizontal rod of length L. Find the momentum about the other end of the rod.	Understand	CAHS007.08 CAHS007.15
7	Four forces of 10 N, 20 N, 25 N and 40 N are concurrent in a plane at origin and passing through the points (3, 2); (1, 7); (4, -2) and (-2, 4) respectively towards origin. Determine the resultant of system of forces.	Understand	CAHS007.08 CAHS007.15
8	A meter scale was suspended by three strings of tensions 100 dyne, 150 dyne and 100 dyne at 20 cm, 56 cm and 70 cm divisions on the scale. It was brought in to equilibrium position by adding three weights of 100 g each. The first two weights are added at 10 cm and 40 cm divisions. Find distance between point where the third weight is attached to the nearest end.	Understand	CAHS007.08 CAHS007.15
9	Determine magnitude and direction of resultant of the following system of non-coplanar concurrent forces from origin are 300 N at (3,4, 6); 400 N at (-2, 4, -5) and 200 N at (-4, 5, -3).	Understand	CAHS007.08 CAHS007.15

10	Determine magnitude and direction of resultant of the following system of non-coplanar concurrent forces from origin are 100 N at (2,3,4); 300 N at (-3, -4, 5) and 200 N at (0, 0, 4).	Understand	CAHS007.08 CAHS007.15
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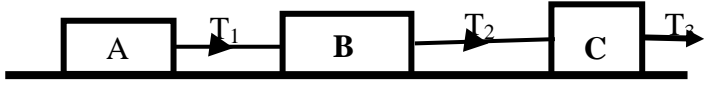
UNIT-IV

FRICTION

Part – A (Short Answer Questions)

1	Explain the concept of friction, how it acts between two rough surfaces in contact with each other.	Understand	CAHS007.09
2	Explain the concept of friction when the object is just about to move. What type of friction is this?	Remember	CAHS007.09
3	When a body slides over a rough inclined plane, it follows certain conditions. Explain these conditions. .	Remember	CAHS007.09
4	Explain the angle of repose. What is its significance?	Remember	CAHS007.09
5	Friction is advantageous to every one in daily life as well as in industry. Justify the statement with examples.	Understand	CAHS007.10
6	Friction is advantageous to every one in daily life as well as in industry. Justify the statement with examples.	Understand	CAHS007.10
7	Mention various steps to be taken to reduce the friction.	Remember	CAHS007.09
8	How are mechanical advantage, velocity ratio and efficiency are related?	Remember	CAHS007.10

Part – B (Long Answer Questions)

1	Derive an equation for acceleration of a body of mass ‘m’ sliding down the rough plane of coefficient of friction μ inclined at an angle ‘ θ ’ with horizontal.	Remember	CAHS007.10
2	Among pushing a lawn roller and pulling a lawn roller, which is difficult and Justify your answer mathematically.	Understand	CAHS007.10
3	Explain how the frictional forces opposes the motion of a body in contact with another rough surface.	Understand	CAHS007.09
4	Illustrate examples to show that friction is very much useful in our daily life and also show examples of events where friction causes a loss.	Understand	CAHS007.10
5	How does adding suitable oil between moving parts decrease the frictional force between the surfaces?	Understand	CAHS007.10
6	50 kN weight was lifted using a force of 1200 N on a lever of 50cm of jack having a pitch of 1.025 cm. Find the efficiency.	Understand	CAHS007.10
7	If three blocks A, B and C weighing 1kg, 8 kg and 27 kg respectively are tied with inextensible strings with each other as shown in figure are moving on a smooth horizontal surface. If T_3 is 36N then calculate T_2 . 	Understand	CAHS007.10

Part - C (Analytical Questions)

1	A body of mass M_1 placed on rough horizontal plane connected with a string over a frictionless pulley. The second end of the string is connected to M_2 suspended vertically downwards. If both the masses moving with uniform acceleration. Find tension in the string and also if the horizontal plane is frictionless find the tension in the string.	Understand	CAHS007.10 CAHS007.15
2	Two bodies of masses M_1 and M_2 are connected by a thin massless	Understand	CAHS007.10

	string over a pulley of an inclined plane of angle θ° with horizontal. M_1 slides up on inclined plane and M_2 moves vertically down with uniform acceleration. Find tension in the string for (a) coefficient of friction μ (b) frictionless inclined plane.		CAHS007.15
3	A ladder 7m long rests against a wall and makes 45° with the ground. A man of height half of weight of ladder climbs it. At what distance along the length of the ladder the person will be, when the ladder is just about to slip? Given the coefficient of friction between the ladder and the wall is $1/3$ and ladder and floor is $1/2$.	Understand	CAHS007.10 CAHS007.15
4	A man weighing 75N stands in the middle of a ladder AB of 25 kilogram weight resting on smooth floor at A. The base of the ladder is 2m away from wall. The top of the ladder B touches the wall at a height 4m from the ground. The ladder is prevented from slipping by a string OD from the bottom of the wall which makes an angle 30° with horizontal. The string OD is perpendicular to the ladder. Find tension in the string OD.	Understand	CAHS007.10 CAHS007.15
5	A man weighing 100 N stands in the middle of a ladder of negligible mass. The bottom end of the ladder is supported and stopped by a step. The ladder makes an angle 60° with horizontal and touches the wall at a height 4 m from the ground. Calculate reaction at the bottom and top of the ladder.	Understand	CAHS007.10 CAHS007.15
6	An aeroplane requires a speed of 80 kmph for take-off. The run way on the ground is 100 m , mass of the plane is 10,000 kg and coefficient of friction between the tyres of plane and the ground is 0.2. Assume that the plane accelerates uniformly during the take-off, what is the minimum force required by the engine of the plane for take-off?	Understand	CAHS007.10 CAHS007.15
7	A screw jack has square threads of mean diameter 6 cm . The helix angle is 10° and coefficient of friction is 0.3. Determine the force to be applied on a 60 cm long handle of jack (a) to raise (b) to lower the load of 3 kN. Find its efficiency of the jack.	Understand	CAHS007.10 CAHS007.15
8	Find the force P required to just raise a block A of 600 N weight using a wedge B of angle 30° . The block is supported by a wedge and the wall. The frictional force between wall and block, wedge and floor is 0.3.	Understand	CAHS007.10 CAHS007.15

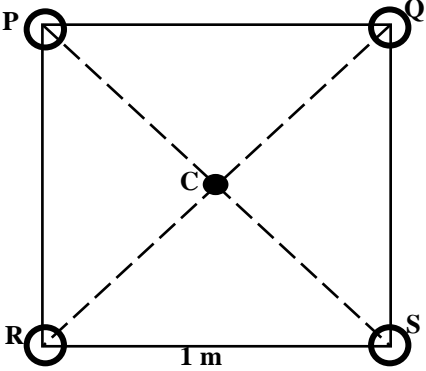
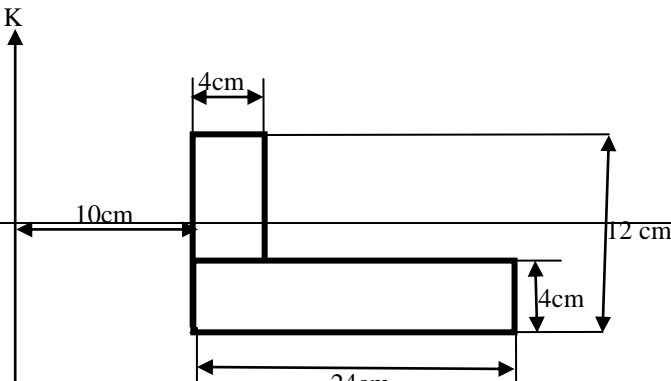
UNIT-V

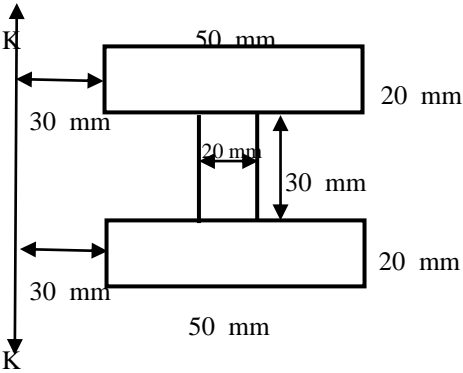
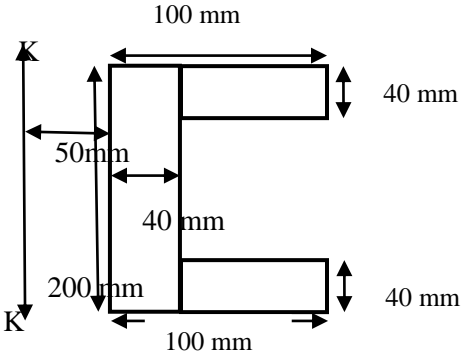
DYNAMICS OF RIGID BODIES - MOMENT OF INERTIA

Part - A (Short Answer Questions)

1	Define moment of inertia in terms of mass and radius of gyration. Write their units and dimensional formula.	Remember	CAHS007.11
2	Explain radius of gyration. How is it related with mass and moment of inertia? What is its physical significance?	Remember	CAHS007.11
3	State the theorem that is to find moment of inertia about an axis parallel to the axis passing through centroid. Represent the relation mathematically.	Remember	CAHS007.12
4	State the theorem that is to find moment of inertia about an axis perpendicular to two mutually perpendicular axis and passing through point of intersection of both the axis. Represent the relation mathematically.	Remember	CAHS007.12
5	Write the relation for moment of inertia about midpoint and end point of a thin rod of length 'L'cm, mass 'M'kg.	Remember	CAHS007.13

6	The length and breadth of rectangular plate of mass M are 'L' and 'B'. What is its moment of inertia about an axis passing through mid point and parallel to its breadth 'B'.	Remember	CAHS007.13
7	Write a relation for moment of inertia of circular disc about its centre (a) Perpendicular to disc (b) Along diameter.	Remember	CAHS007.13
Part - B (Long Answer Questions)			
1	Moment of inertia of the body about a given axis can be determined when its moment of inertia about some other axis is given. Justify this by stating and proving perpendicular axes theorem.	Remember	CAHS007.12
2	Moment of inertia of the body about a given axis can be determined when its moment of inertia about some other axis is given. Justify this by stating and proving parallel axes theorem.	Remember	CAHS007.12
3	Derive a relation for moment of inertia of thin rod of length 'L' and mass 'M' about its centre.	Remember	CAHS007.13
4	Calculate moment of inertia of a rectangular lamina of length 'L', breadth 'B' and mass 'M', about an axis passing through centroid parallel to length.	Remember	CAHS007.13
5	Calculate moment of inertia of a rectangular lamina of length 'L', breadth 'B' and mass 'M', about an axis passing through centroid parallel to breadth	Remember	CAHS007.13
6	Calculate moment of inertia of a rectangular lamina of length 'L', breadth 'B' and mass 'M', about an axis passing through edge along the breadth.	Remember	CAHS007.13
7	Calculate moment of inertia of a rectangular lamina of length 'L', breadth 'B' and mass 'M', about an axis passing through edge along the length	Remember	CAHS007.13
8	Derive a relation for moment of inertia along the diagonal of circular disc of mass 'M' and radius 'R'.	Remember	CAHS007.13
9	Derive a relation for moment of inertia of circular disc of mass M and radius R along the perpendicular passing through centroid.	Remember	CAHS007.13
10	Calculate moment of inertia of a rectangular lamina of length 'L', breadth 'B' and mass 'M', about an axis passing through centroid and perpendicular to lamina .	Remember	CAHS007.13
11	Calculate moment of inertia of a rectangular lamina of length 'L', breadth 'B' and mass 'M', about an axis passing through one of the vertex and perpendicular to lamina.	Remember	CAHS007.13
Part - C (Analytical Questions)			
1	A thin wheel has moment of inertia 70 kg-m^2 and its diameter is 4.4 cm. How much pulling force is to be applied on the thread wound on axle to produce an angular acceleration 0.5 rad s^{-2} .	Understand	CAHS007.11
2	Calculate moment of inertia of a rectangular lamina of mass 2 Kg about centroid and perpendicular to it. The length and breadth of the lamina are 10 cm and 4 cm respectively.	Understand	CAHS007.14 CAHS007.15
3	Determine moment of inertia about diameter of a circular disc of mass 500 g and radius 8 cm and moment of inertia about centroid perpendicular to the disc .	Understand	CAHS007.14 CAHS007.15
4	A thin metal rod of 1m and mass 40 g is suspended horizontally with the help of a thin mass less thread. Calculate its moment of inertia about the thread and also at the end perpendicular to the rod.	Understand	CAHS007.14 CAHS007.15

5	A thin rod of negligible mass is attached along the length of a rectangular plate. The length and breadth of the plate are 6cm and 3cm. If the mass of the plate is 900g. Find the moment of inertia of plate along the thin rod.	Understand	CAHS007.14 CAHS007.15
6	A rectangular metal block of mass 12 g and area 0.54 m^2 has its length and breadth in the ratio 1:6. Find the moment of inertia of the block about the axis of rotation perpendicular to the block and passing through the centre of the block.	Understand	CAHS007.14 CAHS007.15
7	Four spheres of mass 2 kg each are placed; one at each vertex of a square of side one 1m. Calculate moment of inertia of the system (a) about an axis passing through the centre and perpendicular to the plane containing 4 spheres (b) about an axis along one of the diagonals of the square.	Understand	CAHS007.14 CAHS007.15
			
8	A cylindrical disc of mass 200 g and radius 10 cm makes 20 revolutions per second about an axis passing through the centre. Calculate (a) its moment of inertia about the same axis (b) the torque required to increase the angular velocity by 20 revolutions per second in 10 seconds.	Understand	CAHS007.14 CAHS007.15
9	Three thin rods of length 'L' and mass 'M' each are connected in the form of equilateral triangle. Calculate the moment of inertia of the system about an axis passing through one of the vertex and perpendicular to the plane of of system of rods.	Understand	CAHS007.14 CAHS007.15
10	If the radius of earth reduces to half, calculate the duration of each day. (Given moment of inertia of sphere is $2MR^2 / 5$).	Understand	CAHS007.14 CAHS007.15
11	In a " T " section , the flange has dimensions 200 mm and 20 mm. Its web has dimensions 20 mm and 200 mm. The total depth of T section is 220 mm . Find moment of inertia about XX axis and YYaxis.	Understand	CAHS007.14 CAHS007.15
12	Find moment of inertia of the following " L " section about the axis KK.	Understand	CAHS007.14 CAHS007.15
			

13	<p>Find moment of inertia of the following I-section about an axis KK.</p> 	Understand	CAHS007.14 CAHS007.15
14	<p>Find moment of inertia of C-section about KK-axis.</p> 	Understand	CAHS007.02 CAHS007.12

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