

MTH-304

**Imp Mcqs for Mid-Term
Exams**

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Math City Layyah

With

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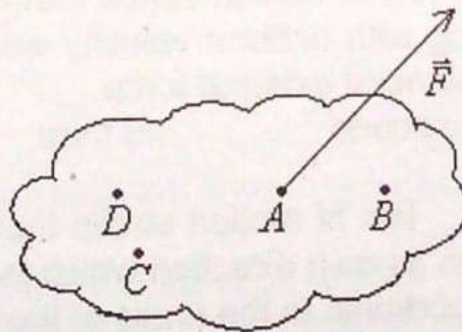
Multiple Choice Questions (MCQs)

Four options are given in each of the following questions, fill the circle in front of that choice which you think is correct. Cutting or filling two or more circles is not allowed:

Q.1

- (i) The quantity of matter in a body is called its
(a) acceleration (b) velocity (c) mass (d) tension
(a) (b) (c) (d)
- (ii) A body of negligible small dimensions is termed as
(a) heavy body (b) small body (c) particle (d) none of these
(a) (b) (c) (d)
- (iii) The concept of a particle is an ideal one and represents a geometrical _____ which posses mass.
(a) ellipse (b) triangle (c) circle (d) point
(a) (b) (c) (d)

- (iv) A body may be regarded as an aggregate of
 (a) ellipses (b) triangles (c) circles ☒ (d) particles
 (a) (b) (c) (d)
- (v) A body is said to be a rigid body if the distance between any two of its particles _____ by any means.
 (a) changes ☒ (b) remains unchanged
 (c) remains variable (d) none of these (a) (b) (c) (d)
- (vi) A body is said to be a rigid body if it _____ its shape in any way.
 (a) changes ☒ (b) does not change
 (c) changes rapidly (d) none of these (a) (b) (c) (d)
- (vii) A body is said to be in motion if it _____ its position with respect to its surroundings in the course of time.
 (a) does not change ☒ (b) changes
 (c) never changes (d) none of these (a) (b) (c) (d)
- (viii) A body is said to be at rest if it _____ its position with respect to its surroundings in the course of time.
☒ (a) does not change (b) changes
 (c) rapidly changes (d) none of these (a) (b) (c) (d)
- (ix) Rest and motion of a body are _____ concepts.
 (a) absolute (b) not relative ☒ (c) relative (d) none of these
 (a) (b) (c) (d)
- (x) The physical quantity which changes or tends to change the state of rest or motion of a body is called
☒ (a) force (b) acceleration (c) velocity (d) none of these
 (a) (b) (c) (d)
- (xi) The line passing through the point of application in the direction of the force is called the _____ of action of force.
 (a) circle (b) point ☒ (c) line (d) none of these
 (a) (b) (c) (d)
- (xii) The point of application of force $\vec{F}$ is



- (a) D (b) C (c) B ☒ (d) A
 (a) (b) (c) (d)
- (xiii) Two force systems are said to be _____ force systems if one system can be replaced by the other system without disturbing the instantaneous state of rest or motion of a body.
 (a) equal (b) unequal ☒ (c) equivalent (d) none of these
 (a) (b) (c) (d)

- (xiv) If a force system is equivalent to a single force $\vec{R}$, then $\vec{R}$ is called the _____ of the system.
☒ (a) resultant (b) component (c) resolved part (d) none of these
 (a) (b) (c) (d)
- (xv) The branch of mechanics which deals with bodies at rest is
 (a) dynamics ☒ (b) statics (c) statistics (d) none of these
 (a) (b) (c) (d)
- (xvi) The branch of mechanics which deals with bodies in motion is
☒ (a) dynamics (b) statics (c) statistics (d) none of these
 (a) (b) (c) (d)
- (xvii) _____ treats of the geometry of motion of bodies without taking into account their masses or the forces acting on them.
☒ (a) Kinematics (b) Kinetics (c) Statistics (d) none of these
 (a) (b) (c) (d)
- (xviii) _____ is concerned with the relations between the forces acting on bodies and the resulting motion.
 (a) Kinematics ☒ (b) Kinetics (c) Statistics (d) none of these
 (a) (b) (c) (d)
- (xix) Classical mechanics is also known as _____ mechanics.
 (a) Fluid (b) Quantum ☒ (c) Newtonian (d) none of these
 (a) (b) (c) (d)
- (xx) _____ mechanics is based on Newton's laws of motion.
 (a) Fluid (b) Quantum ☒ (c) Classical (d) none of these
 (a) (b) (c) (d)

Q.2

- (i) In Newtonian mechanics, space time and mass are _____ concepts independent of each other.
 (a) relative ☒ (b) absolute (c) not absolute (d) none of these
 (a) (b) (c) (d)
- (ii) Newton's _____ law of motion states that a body at rest will remain at rest, and a body moving with uniform velocity will continue to do so, unless acted on by some unbalanced external force.
☒ (a) first (b) second (c) third (d) none of these
 (a) (b) (c) (d)
- (iii) Newton's _____ law of motion states that a force applied on a body produces acceleration in its own direction which is proportional to the applied force and inversely proportional to the mass of the body.
 (a) first ☒ (b) second (c) third (d) none of these
 (a) (b) (c) (d)
- (iv) Newton's _____ law of motion states that action and reaction are equal and opposite.
 (a) first (b) second ☒ (c) third (d) none of these
 (a) (b) (c) (d)
- (v) The product of the mass of the object and velocity is called its
 (a) velocity ☒ (b) momentum (c) acceleration (d) none of these
 (a) (b) (c) (d)

(vi) If a particle of mass m is moving with a velocity $\vec{v}$, then its linear momentum is

- (a) $m\vec{a}$ (b) $m^2\vec{a}$ (c) $m^2\vec{v}$ (d) $m\vec{v}$
☐ (a) ☒ (b) ☐ (c) ☐ (d)

(vii) Mathematical form of Newton's second law of motion is $\vec{F} =$

- (a) $m\vec{a}$ (b) $m^2\vec{a}$ (c) $m^2\vec{v}$ (d) $m\vec{v}$
☒ (a) ☐ (b) ☐ (c) ☐ (d)

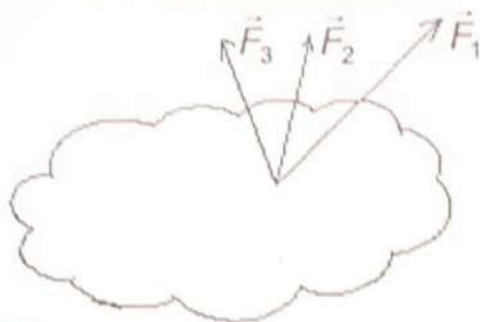
(viii) The forces passing through a single point are called _____ forces.

- (a) parallel (b) concurrent (c) non-concurrent (d) none of these
☐ (a) ☒ (b) ☐ (c) ☐ (d)

(ix) The forces lying in the same plane are called _____ forces.

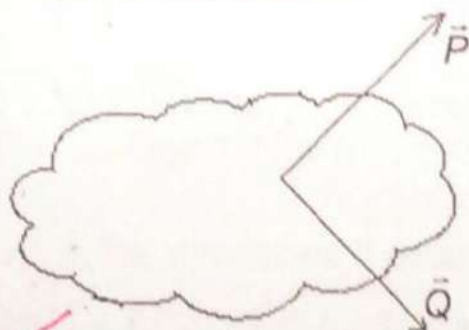
- (a) non-coplanar (b) coplanar (c) skew (d) none of these
☒ (a) ☐ (b) ☐ (c) ☐ (d)

(x) Forces $\vec{F}_1, \vec{F}_2$ and $\vec{F}_3$ are _____ forces.



- (a) parallel (b) concurrent (c) non-concurrent (d) none of these
☐ (a) ☒ (b) ☐ (c) ☐ (d)

(xi) Forces $\vec{P}$ and $\vec{Q}$ have _____ of action.



- (a) same direction (b) different lines (c) same line (d) none of these
☐ (a) ☒ (b) ☐ (c) ☐ (d)

(xii) The action of a given force system on a body _____ if we add to or subtract from them another force system in equilibrium.

- (a) is changed (b) remains unchanged (c) is changed rapidly (d) none of these
☐ (a) ☒ (b) ☐ (c) ☐ (d)

(xiii) The point of application of a force acting on a rigid body _____ be transferred to any other point of the body lying on the line action of the force without changing its effect.

- (a) can (b) cannot (c) can never (d) none of these
☒ (a) ☐ (b) ☐ (c) ☐ (d)

(xiv) The magnitude w of the weight of the particle can be written as $w = \underline{\hspace{2cm}}$, where m is the mass of the particle and g is the gravitational acceleration.

- (a) $m\sqrt{g}$ (b) mg^2 (c) m^2g ☒ (d) mg
 (a) (b) (c) (d)

(xv) When two forces $\vec{P}$ and $\vec{Q}$ act on a particle their resultant $\vec{R}$ is found by the

- (a) Newton's first law of motion (b) Newton's second law of motion
 (c) Newton's third law of motion ☒ (d) parallelogram law of forces
 (a) (b) (c) (d)

(xvi) If a force $\vec{R}$ makes an angle θ with x-axis, then the resolved part of $\vec{R}$ along x-axis is

- (a) $R \cot \theta$ (b) $R \tan \theta$ (c) $R \sin \theta$ ☒ (d) $R \cos \theta$
 (a) (b) (c) (d)

(xvii) If a force $\vec{R}$ makes an angle θ with x-axis, then the resolved part of $\vec{R}$ along y-axis is

- (a) $R \cot \theta$ (b) $R \tan \theta$ ☒ (c) $R \sin \theta$ (d) $R \cos \theta$
 (a) (b) (c) (d)

(xviii) The resolved part of $\vec{R}$ along x-axis is

- ☒ (a) $\vec{R} \cdot \hat{i}$ (b) $\vec{R} \times \hat{i}$ (c) $\vec{R} \cdot \hat{j}$ (d) $\vec{R} \times \hat{j}$
 (a) (b) (c) (d)

(xix) The resolved part of $\vec{R}$ along y-axis is

- (a) $\vec{R} \cdot \hat{i}$ (b) $\vec{R} \times \hat{i}$ ☒ (c) $\vec{R} \cdot \hat{j}$ (d) $\vec{R} \times \hat{j}$
 (a) (b) (c) (d)

(xx) The magnitude R of the resultant of forces $\vec{P}$ and $\vec{Q}$ acting at an angle α is

- (a) $\sqrt{P^2 + Q^2 + 2PQ \tan \alpha}$ (b) $\sqrt{P^2 + Q^2 + 2PQ \cot \alpha}$
 (c) $\sqrt{P^2 + Q^2 + 2PQ \sin \alpha}$ ☒ (d) $\sqrt{P^2 + Q^2 + 2PQ \cos \alpha}$
 (a) (b) (c) (d)

Q.3

(i) Two forces of magnitudes 3 and 5 units act at an angle 60° , the magnitude of their resultant is

- (a) 49 (b) 10 (c) 8 ☒ (d) 7
 (a) (b) (c) (d)

(ii) The maximum magnitude of the resultant of forces $\vec{P}$ and $\vec{Q}$ is

- (a) $P^2 - Q^2$ (b) $P - Q$ ☒ (c) $P + Q$ (d) $P^2 + Q^2$
 (a) (b) (c) (d)

(iii) The minimum magnitude of the resultant of forces $\vec{P}$ and $\vec{Q}$ is

- (a) $P^2 - Q^2$ ☒ (b) $P - Q$ (c) $P + Q$ (d) $P^2 + Q^2$
 (a) (b) (c) (d)

(iv) If two forces $\vec{P}$ and $\vec{Q}$ act at an angle α , then the angle of their resultant with $\vec{P}$ is

$$(a) \tan^{-1}\left(\frac{P}{Q}\right)$$

$$(b) \tan^{-1}\left(\frac{Q \sin \alpha}{P + Q \cos \alpha}\right)$$

$$(c) \tan^{-1}\left(\frac{P \sin \alpha}{Q + P \cos \alpha}\right)$$

$$(d) \tan^{-1}\left(\frac{Q}{P}\right)$$

(a) (b) (c) (d)

- (v) If two forces $\vec{P}$ and $\vec{Q}$ act at an angle α , then the angle of their resultant with $\vec{Q}$ is

$$(a) \tan^{-1}\left(\frac{P}{Q}\right)$$

$$(b) \tan^{-1}\left(\frac{Q \sin \alpha}{P + Q \cos \alpha}\right)$$

$$(c) \tan^{-1}\left(\frac{P \sin \alpha}{Q + P \cos \alpha}\right)$$

$$(d) \tan^{-1}\left(\frac{Q}{P}\right)$$

(a) (b) (c) (d)

- (vi) The resultant of two forces of equal magnitude will _____ the angle between them.

(a) not bisect

(b) trisect

(c) bisect

(d) none of these

(a) (b) (c) (d)

- (vii) Two forces of magnitudes 7 and 4 units act at an angle 60° , the angle of their resultant with the force of magnitude 7 is

$$(a) \tan^{-1}\left(\frac{2\sqrt{3}}{9}\right)$$

$$(b) \tan^{-1}\left(\frac{7\sqrt{3}}{15}\right)$$

$$(c) \tan^{-1}\left(\frac{7}{4}\right)$$

(d) none of these

(a) (b) (c) (d)

- (viii) Two forces of magnitudes 7 and 4 units act at an angle 60° , the angle of their resultant with the force of magnitude 4 is

$$(a) \tan^{-1}\left(\frac{2\sqrt{3}}{9}\right)$$

$$(b) \tan^{-1}\left(\frac{7\sqrt{3}}{15}\right)$$

$$(c) \tan^{-1}\left(\frac{7}{4}\right)$$

(d) none of these

(a) (b) (c) (d)

- (ix) The magnitude of the resultant of forces $\vec{P}$ and $\vec{Q}$ acting perpendicularly is

$$(a) \sqrt{P^2 - Q^2}$$

$$(b) P^2 - Q^2$$

$$(c) P^2 + Q^2$$

$$(d) \sqrt{P^2 + Q^2}$$

(a) (b) (c) (d)

- (x) The resultant of two concurrent forces $\lambda \vec{OA}$ and $\mu \vec{OB}$ is _____, where C divides AB such that $AC : CB = \mu : \lambda$.

$$(a) (\lambda + \mu) \vec{OC}$$

$$(b) (\lambda - \mu) \vec{OC}$$

$$(c) \lambda \vec{OC}$$

$$(d) \mu \vec{OC}$$

(a) (b) (c) (d)

- (xi) Forces P , Q act at a point O and their resultant is R . If any transversal cuts the lines of action of the forces in the points A , B , C respectively, then

$$\frac{P}{OA} + \frac{Q}{OB} =$$

$$(a) \frac{R^2}{OC}$$

$$(b) \frac{R}{OC}$$

$$(c) \frac{OC}{R}$$

(d) none of these

(a) (b) (c) (d)

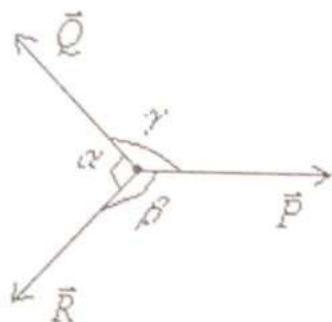
(xii) The necessary and sufficient condition for a particle to be in equilibrium under the action of the forces $\vec{P}_1, \vec{P}_2, \dots, \vec{P}_n$ is that $\vec{P}_1 + \vec{P}_2 + \dots + \vec{P}_n =$

- (a) $\hat{i}$ (b) $\hat{j}$ (c) $\hat{k}$ (d) 0
 (a) (b) (c) (d)

(xiii) If a particle is in equilibrium under the action of three forces, then the magnitude of each force is proportional to the _____ of the angle between the other two.

- (a) cosine (b) sine (c) cosecant (d) secant
 (a) (b) (c) (d)

(xiv) If the particle is in equilibrium under the action of forces in the adjoining figure,



then

- (a) $\frac{P}{\cot \alpha} = \frac{Q}{\cot \beta} = \frac{R}{\cot \gamma}$ (b) $\frac{P}{\tan \alpha} = \frac{Q}{\tan \beta} = \frac{R}{\tan \gamma}$
 (c) $\frac{P}{\cos \alpha} = \frac{Q}{\cos \beta} = \frac{R}{\cos \gamma}$ (d) $\frac{P}{\sin \alpha} = \frac{Q}{\sin \beta} = \frac{R}{\sin \gamma}$

(a) (b) (c) (d)

(xv) The tendency of a force to turn a body about a point is called the _____ of that force.

- (a) magnitude (b) direction (c) moment (d) none of these

(xvi) If $\vec{r}$ is the position vector of the point of application A of the force $\vec{F}$ from a fixed point O, then the moment of the force $\vec{F}$ about O is $\vec{M} =$

- (a) $\vec{r} \cdot \vec{F}$ (b) $\vec{r} \times \vec{F}$ (c) $\vec{r} + \vec{F}$ (d) $\vec{r} - \vec{F}$

(a) (b) (c) (d)

(xvii) The moment of a force $\vec{F}$ about a point O is _____ to the plane containing O and $\vec{F}$.

- (a) not perpendicular (b) parallel (c) perpendicular (d) none of these

(xviii) The moment of the resultant of concurrent forces about a point is equal to the _____ of moments of the forces about that point.

- (a) difference (b) sum (c) product (d) none of these

(xix) The moment of a force is _____ if the rotation is anticlockwise.

- (a) zero (b) positive (c) negative (d) none of these

(a) (b) (c) (d)

- (xx) The moment of a force is _____ if the rotation is clockwise.
 (a) zero (b) positive ☒ (c) negative (d) none of these
 (a) (b) (c) (d)
- (xxi) The necessary and sufficient condition for the equilibrium of a system of coplanar couples is that the algebraic sum of their moments is
☒ (a) zero (b) positive (c) negative (d) none of these
 (a) (b) (c) (d)
- (xxii) If forces are completely represented by the sides of a plane polygon taken in order, then they are equivalent to a couple whose moment is represented by _____ the area of the polygon.
 (a) half of ☒ (b) twice (c) negative (d) none of these
 (a) (b) (c) (d)

Short Questions

Q.4 Solve / write answers of the following short questions:

- (i) Define the following:
 (a) Body (b) Mass (c) Particle
- (ii) Define the concept of rigid body.
- (iii) Define the concept of force.
- (iv) State Newton's First Law of Motion.
- (v) State Newton's Second Law of Motion.
- (vi) When forces are in equilibrium?
- (vii) State Newton's Third Law of Motion.
- (viii) State parallelogram of forces.
- (ix) State equilibrium law.
- (x) State law of superposition.
- (xi) State principle of transmissibility of forces.
- (xii) A force of 10 N is acting at an angle 30° with x-axis. Find its resolved parts along x-axis and y-axis.
- (xiii) A force of 10 N is acting at an angle 30° with y-axis. Find its resolved parts along x-axis and y-axis.
- (xiv) Forces of 8 N and 7 N are acting at an angle 60° . Find the magnitude of the resultant.
- (xv) Forces of 12 N and 10 N act at an angle 30° . Find the magnitude of the resultant.
- (xvi) Forces of 8 N and 7 N act at an angle 60° . Find the angle which the resultant makes with force 8 N.
- (xvii) Forces of 8 N and 7 N act at an angle 60° . Find the angle which the resultant makes with force 7 N.
- (xviii) Find the greatest and the least resultants of the forces of 8 N and 7 N.
- (xix) The greatest and least resultants of two forces acting at an angle 60° are of magnitudes P and Q respectively. Find the magnitude of the resultant of the forces.
- (xx) What are concurrent forces?

Multiple Choice Questions (MCQs)

Four options are given in each of the following questions fill the circle in front of that choice which you think is correct. Cutting or filling two or more circles is not allowed:

Q.1

- (i) If n particles of masses $m_1, m_2, \dots, m_n$ with position vectors $\vec{r}_1, \vec{r}_2, \dots, \vec{r}_n$ relative to an origin O , then the _____ of the set of particles is $\sum_{i=1}^n m_i \vec{r}_i$.
- (a) angular moment (b) linear moment (c) velocity (d) tension
- (a) (b) (c) (d)
- (ii) Two particles of masses 1 lb and 2 lb are placed at the points $\hat{i} - 2\hat{j}$ and $3\hat{i}$ respectively, their linear moment with respect to the origin is
- (a) $2\hat{i} + 7\hat{j}$ (b) $2\hat{i} - 7\hat{j}$ (c) $7\hat{i} + 2\hat{j}$ (d) $7\hat{i} - 2\hat{j}$
- (a) (b) (c) (d)
- (iii) The centre of mass of a set of particles is the point with respect to which the linear moment of the set is
- (a) negative (b) zero (c) positive (d) none of these
- (a) (b) (c) (d)
- (iv) A set of particles of masses 1 lb, 2 lb and 3 lb placed at points $A(1,1)$, $B(2,-1)$ and $C(3,5)$ respectively, the centre of mass of the set of particles is
- (a) $\left(\frac{7}{3}, \frac{7}{3}\right)$ (b) $\left(\frac{7}{3}, -\frac{7}{3}\right)$ (c) $\left(-\frac{7}{3}, \frac{7}{3}\right)$ (d) $(7,7)$
- (a) (b) (c) (d)

- (v) If the particles of masses $m_1, m_2, \dots, m_n$ are located at the points $P_1(\vec{r}_1), P_2(\vec{r}_2), \dots, P_n(\vec{r}_n)$, then the centre of mass is $\vec{r} =$

(a) $\frac{1}{\sum_{i=1}^n m_i \sum_{i=1}^n m_i \vec{r}_i}$ (b) $\frac{\sum_{i=1}^n m_i}{\sum_{i=1}^n m_i \vec{r}_i}$ ✓ (c) $\frac{\sum_{i=1}^n m_i \vec{r}_i}{\sum_{i=1}^n m_i}$ (d) $\sum_{i=1}^n m_i \vec{r}_i$
 (a) (b) (c) (d)

- (vi) Centre of mass of set of particles of masses m_1, m_2, m_3 placed at $\vec{r}_1, \vec{r}_2, \vec{r}_3$ is

✓ (a) $\vec{r} = \frac{m_1 \vec{r}_1 + m_2 \vec{r}_2 + m_3 \vec{r}_3}{m_1 + m_2 + m_3}$ (b) $\vec{r} = \frac{m_1 + m_2 + m_3}{m_1 \vec{r}_1 + m_2 \vec{r}_2 + m_3 \vec{r}_3}$
 (c) $\vec{r} = m_1 \vec{r}_1 + m_2 \vec{r}_2 + m_3 \vec{r}_3$ (d) none of these (a) (b) (c) (d)

- (vii) A set of particles of masses 7 lb, 4 lb, and 6 lb placed at points $A(-2,1)$, $B(1,2)$ and $C(5,4)$ respectively, the centre of mass of the set of particles is

(a) $\left(\frac{7}{3}, \frac{7}{3}\right)$ ✓ (b) $\left(\frac{20}{17}, \frac{39}{17}\right)$ (c) $\left(\frac{39}{17}, \frac{20}{17}\right)$ (d) $(20,39)$
 (a) (b) (c) (d)

- (viii) The centre of mass of a rod of mass m and length l is

✓ (a) $\frac{1}{m} \int_0^l x dm$ (b) $m \int_0^l x dm$ (c) $m^2 \int_0^l x dm$ (d) none of these
 (a) (b) (c) (d)

- (ix) The centre of mass of a rod of uniform density and length l is

(a) $\frac{l}{6}$ (b) $\frac{l}{4}$ ✓ (c) $\frac{l}{2}$ (d) l
 (a) (b) (c) (d)

- (x) The point through which the resultant weight of a body passes is called the centre of _____ of the body.

✓ (a) gravity (b) symmetry (c) axis (d) none of these
 (a) (b) (c) (d)

- (xi) The potential energy of a body is _____ that of a single particle with mass equal to the total mass of the body situated at its centre.

(a) less than ✓ (b) equal to (c) greater than (d) none of these
 (a) (b) (c) (d)

- (xii) Symmetry about the line is called _____ symmetry.

✓ (a) axial (b) central (c) point (d) none of these
 (a) (b) (c) (d)

- (xiii) Symmetry with respect to a point O is called _____ symmetry and the point O is called the centre of symmetry.

(a) axial ✓ (b) central (c) point (d) none of these
 (a) (b) (c) (d)

- (xiv) A uniform rod is symmetric with respect to its

(a) one end ✓ (b) midpoint (c) trisected point (d) none of these
 (a) (b) (c) (d)

- (xv) A uniform circular cylinder is symmetric with respect to its

(a) base (b) top ✓ (c) axis (d) none of these
 (a) (b) (c) (d)

Short Questions

Q.2 Solve / write answers of the following short questions:

- (i) Find the linear moment, with respect to the origin, of three particles of masses 7 lb, 4 lb and 6 lb respectively placed at the points $\hat{i} - \hat{j}$, $2\hat{i} + \hat{j}$ and $\hat{i} + 3\hat{j}$.
- (ii) Define the centre of mass of a set of particles
- (iii) Find the centroid of the points $3\hat{i} + \hat{j}$, $\hat{i} - 2\hat{j} + \hat{k}$ and $2\hat{i} - 3\hat{j} + 8\hat{k}$. If particles of masses 2, 4, 3 grams are placed respectively at these points, what will be their *c.m.*?
- (iv) Four masses of 4, 2, 1, and 7 units are placed along the x-axis at the points (2,0), (-1,0), (-8,0), and (8,0) respectively. Find the centre of mass of the system.
- (v) Find the *c.m.* of a homogeneous thin rod of length l and mass m .
- (vi) Define symmetric with respect to a point.
- (vii) Define symmetric with respect to a line.
- (viii) Define symmetric with respect to a plane.
- (ix) Find the centroid of the region bounded by the coordinate axes and the circle $x^2 + y^2 = 9$ which lies in the first quadrant.
- (x) A uniform rod AB is 4 ft long and weighs 8 lb and weights are attached to it as follows: 2 lb at A , 2 lb at 1 ft from A , 3 lb at 2 ft from A , 4 lb at 3 ft from A and 5 lb at B . Find the distance from A of the centre of gravity of the system.

SUMMARY

- The centre of mass, *c.m.* of a set of particles is the point with respect to which the linear moment of the set is zero.
- Every set of particles has one and only one centre of mass.
- By a thin rod we mean a rigid body which has length only and whose breadth and thickness are negligible.
- By a lamina we mean a flat rigid body whose thickness is negligible.
- A body is said to be symmetric with respect to a point O if and only if corresponding to every point P of the body there exists a point P' in the body such that O is the middle point of the line segment PP' and $\rho(P) = \rho(P')$, i.e., the density of the body at the points P , P' is the same.
- Symmetry with respect to a point O is called central symmetry and the point O is called the centre of symmetry.
- A uniform circular wire or a circular lamina is symmetric with respect to its geometric centre.
- A uniform solid sphere or spherical shell is symmetric with respect to its geometric centre.
- A uniform rod is symmetric with respect to its midpoint.