MULTIPLE CHOICE QUESTIONS (MCQs)

Displacement:

(1) The change of position of a body in a particular direction is called its:

* Displacement * Velocity * Speed * Acceleration

(2) The shortest distance between two points covered along a straight line is called:

* Speed * Displacement * Velocity * Acceleration

(3) The S.I unit of displacement is:

* Metre * Foot * Centimeter * All of these

Velocity:

(4) The rate of change of distance is called:

* Motion * Velocity * Speed * Acceleration

(5) The rate of change of displacement is called:

* Speed * Acceleration * Velocity * Retardation

(6) The total change of displacement divided by the total change in time of a body is called its:

* Uniform Velocity * Instantaneous Velocity
* Average Velocity * Non-Uniform Velocity

(7) The change of displacement in a very small interval of time of a body is called its:

* Non-Uniform Velocity * Average Velocity
* Uniform Velocity * Instantaneous Velocity

(8) The average and instantaneous velocities will be equal when a body moves with: [2008 F]

* Uniform velocity * Constant acceleration
* Variable acceleration * Retardation

(9) The magnitude of velocity is called:

* Acceleration * Speed * Distance * Retardation

(10) If $\overrightarrow{\Delta r}$ is the change in the position of body during time Δt, then its velocity is equal to:

* $\frac{\overrightarrow{\Delta V}}{\Delta t}$ * $\frac{\overrightarrow{\Delta P}}{\Delta t}$ * $\frac{\overrightarrow{\Delta r}}{\Delta t}$ * $\frac{\overrightarrow{\Delta x}}{\Delta t}$

(11) A boy goes from 2 m to 12m mark and back to 10m mark in 3 second its average speed is: [2003 P.M]

* 2 m/s * 6 m / s * 4 m / s * Zero

(12) A particle of mass 0.5gm moving along x – aixs is located at x_1 = 15m at T_1= 5Sec and at x_2 = 33m at 13sec. Its velocity is:
* 2.45m/Sec * 6m/Sec * 4.45m/Sec * 2.25m/Sec

(13) If the distance-time graph of a moving body is a straight line, the body moves with:
* Uniform velocity * Uniform acceleration
* Non-uniform acceleration * Average velocity

(14) If the distance – time graph of a moving body is a curve, the body moves with:
* Uniform velocity * Average velocity * Uniform Acceleration * Variable velocity

(15) The S.I unit of velocity is:
* Foot/Second * Meter/Second * Centimeter/Second * All of these

(16) The dimension of velocity is:
* LT * LT^{-1} * LT^2 * LT^{-2}

Acceleration:

(17) The change in velocity per unit time is called:
* Speed * Uniform velocity * Acceleration * Retardation

(18) If the velocity of a body increases by equal amounts in equal intervals of time it is said to have:
* Uniform acceleration * variable acceleration
* Average acceleration * Instantaneous acceleration

(19) The acceleration of a body in a very small interval of time (time tends to zero) is called:
* Average acceleration * Uniform acceleration
* Variable acceleration * Instantaneous acceleration

(20) When the value of average and instantaneous acceleration are equal the body is said to be moving with:
* Average acceleration * Uniform acceleration
* Instantaneous acceleration * Variable acceleration

(21) The rate of increase of velocity is called:
* Negative Acceleration * Final velocity
* Average velocity * Positive Acceleration

(22) The decrease in velocity per unit time is called:
* Initial velocity * Final velocity * Average velocity * Retardation

(23) The S.I unit of acceleration is:
* m/s^2 * Foot $/s^2$ * cm/s^2 * All of these

(24) The dimensions of acceleration is:
* LT * LT^2 * LT^{-1} * LT^{-2}

(25) If the velocity time graph of a moving body is a curve, the body moves with: [2005]
* Constant speed * Constant velocity
* Constant Acceleration * Changing Acceleration

(26) The acceleration of body moving with uniform velocity is:
* Zero * Not Zero * Uniform * Variable

(27) What is the average acceleration if a car moves 20m/s to 50m/s in 15 Sec?
* 1 m/s^2 * 2 m/s^2 * 3 m/s^2 * 4 m/s^2

(28) If a car is moving with uniform acceleration of 2m/sec^2, then in 4 seconds its velocity increases from 10m/sec. to:
* 8 m/sec * 18 m/sec * 28 m/sec * 38m/sec

(29) A body starting from rest covers a distance of 0.45km and acquired a velocity of 300km/hr. Its acceleration will be:
* 0.092 m/sec^2 * 0.5 m/sec^2 * 7.71 m/sec^2 * 0.15 m/sec^2

Equations of Motion:

(30) Which one is the correct equation to calculate time "t" when "v_i", "v_f" and "a" have their usual meaning: **[2008 F]**

* $t = \frac{v_f + a}{v_i}$ * $t = \frac{v_i + a}{v_f}$ * $t = \frac{v_f - v_i}{a}$ * $t = \frac{v_f + v_i}{a}$

(31) Which one is the correct equation to acceleration "a" when "v_i", "v_f" and "s" have their usual meaning: **[2009 F]**

* $a = \frac{v_f^2 + v_i^2}{S}$ * $a = \frac{v_f^2 + v_i^2}{2S}$ * $a = \frac{v_f^2 - v_i^2}{2S}$ * $a = \frac{v_i^2 - v_f^2}{2S}$

(32) The distance covered by a body in time t starting from rest is:

* $\frac{1}{3}at^2$ * V t * $\frac{1}{2}at^2$ * at^2

Motion Under Gravity:

(33) The force which attracts a body towards the centre of earth is called:

* Mass * Weight * Density * Acceleration

(34) How much height does a freely falling body of mass 10 kg lose in 2S? **[2003 P.M, 2005 S,2006]**

* 9.8 * 19.6 m * 49 m * 4.9 m

(35) A 1kg stone when falling freely from a height of 10m strike the ground with the velocity of: **[2002 P.M, 2006 F]**

* 10 m/s * 14 m/s * 98 m/s * 196 m/s

(36) A body is thrown vertically upward with an initial velocity 9.8 m/s. It will attain a height:

* 9.8 m * 19.8 m * 4.9 m * 29.4 m

(37) How many metre will a 20kg ball, starting from rest, fall freely in one second:

* 19.6m * 9.8m * 4.0m * 4.9m

(38) A 5 kg mass is falling freely, the force acting on it will be: **[2007 S]**

* 5 N * 9.8 N * 19.6 N * Zero

(39) Pull of the earth on a mass of 20 kg on the surface of earth is:

* 20 N * 196 N * 19.6 N * 1960 N

Laws of Motion:

(40) The Laws of motion show the relation between:

* Mass and Weight * Mass and velocity
* Mass and acceleration * Force and acceleration

(41) Newton's First law of motion is also known as the: **[2009 F]**

* Law of Power * Law of Inertia
* Law of Action and Reaction * Law of Force

(42) Inertia of a body is measured in terms of:

* Its mass * Its weight * Its velocity * Its reaction

(43) When a constant force is applied on a body, it moves with the uniform: **[2008 F]**

* Velocity * Speed * Acceleration * Momentum

(44) Swimming is possible because of which law of motion:

* First * Second * Third * All of these

(45) It is true that: * $a = mF$ * $a = \frac{v}{F}$ * $a = \frac{F}{m}$ * $a = \frac{m}{F}$

(46) If F is kept constant and m is doubled, then acceleration is:

* One-fourth * One-half * One-third * One-ninth

(47) The unit of tension in C.G.S system is: **[2007 S]**

* Joule * Energy * dyne * Foot-Pound

(48) Dyne is the unit of: **[2009 F]**

* Angular Acceleration * Acceleration
* Displacement * Force

(49) A helicopter of mass 3×10^3 kg rises vertically with constant speed of 25 m/s. What resultant force acts on the helicopter? **[2002 P.E]**
* Zero * 3×10^6 N downward
* 3×10^4 N upward * 7.5×10^4 N

(50) A stone has mass 100 gm. Its weight will be:
* 9800 N * 0.98 N * 0.0980 N * 98000 N

(51) A mass of 5 kg moves with an acceleration of 10 m /s^2 force on it is:
* 10 N * 50 N * 2 N * 15 N

(52) Newton is the force which produces an acceleration of 1 m/sec^2 in a body of mass:
* $\frac{1}{2}$Kg * 1 Kg * 2 Kg * 2 gm

(53) A helicopter weighing 3920N is moving up with a constant speed of 4m/sec the force on the helicopter is:
* 4720 N * 3920 N * 3924 N * 3916 N **[2012]**

Motion of Bodies connected by a string:

(54) Two bodies of masses 'm_1' and 'm_2' are hanging vertically over a pulley. Their acceleration is given by the formula:
* $a = \left(\frac{m + m_2}{m_1 + m_2}\right)g$ * $a = \left(\frac{m_1 - m_2}{m_1 + m_2}\right)g$ * $a = \frac{2m_1m_2}{m_1 + m_2}g$ * $a = \frac{m_2 g}{m_1 + m_2}$

(55) Two bodies of masses m_1 and m_2 are hanging vertically over a pulley. The tension is given by the formula:
* $T = \frac{m_1m_2g}{m_1 + m_2}$ * $T = \frac{m_1 g}{m_1 + m_2}$ * $T = \frac{m_2 g}{m_1 + m_2}$ * $T = \frac{2m_1m_2g}{m_1 + m_2}$

(56) The force applied on a body through a string is called:
* Weight * Momentum * Tension * Torque

(57) The S.I unit of tension is:
* Watt * Joule * Newton * Dyne

(58) The direction of tension in a string will always be in the:
* Same direction of applied force * opposite direction of applied force
* Both of these * None of these

(59) A body of mass 10kg is suspended by a string, the tension produced in the string is ($g = 10$ m/s^2):
* 100 N * 18 N * 9.8 N * 980 N

Momentum and law of Conservation of Momentum:

(60) The product of mass of a particle and its velocity is called:
* Force * Acceleration * Momentum *Angular momentum

(61) The S.I unit of linear momentum is: **[2003 P.E, 2004, 2006 S]**
* N/s * N-s * J/s * N·m

(62) Quantity of motion is also called:
* Thrust * Torque * Moment * Momentum

(63) A force of 50 N acts on a body for 10 second what will be the change in momentum:
* 200 N.s * 800 N.s * 5 N.s * 500 N.s

(64) A rocket moves according to the law of conservation of:
* Mass * Energy * Momentum * Force

(65) When a bullet is fired from a gun, the gun moves backward with a:
* Velocity equal to that of the bullet * Velocity less than that of the bullet
* Velocity greater than that of the bullet * Remains at rest

(66) If a constant force acts on a body for a very short time, then impulse will be:
* $\frac{F}{\Delta t}$ * $\frac{m}{a}$ * ma * $F\Delta t$

Elastic collision:

(67) In case of an elastic collision: **[2001, 2003, P.E, 2005 S, 2008]**
* Both momentum and K. E are conserved
* Neither momentum nor K. E is conserved
* Only momentum is conserved
* Only K. E is conserved

(68) In an inelastic collision of two bodies:
* K·E is conserved only
* Momentum is conserved only
* Both K·E and momentum are conserved
* None of these

(69) When two balls collide and as a result temperature changes, which one of the following law is conserved?
* Velocity * Kinetic energy * Momentum * Inertia

(70) The velocity of a body after elastic collision with a body of the same mass at rest will be: **[2006 F]**
* Reduced to half * Doubled * Unaltered * Zero

(71) If a light object collides elastically with a massive body which is at rest, light object will:
* rebound with the same velocity
* be stopped
* rebound with twice the velocity
* cause the massive body to move

(72) Two balls one light and the other heavy have equal momentum, Which of them has greater velocity:
* The light ball
* The heavy ball
* Both have equal velocities
* Depends upon the direction of momentum

Friction:

(73) A force which resists the motion of a body is called: **[2008 F]**
* Friction * Static friction * Kinetic friction * All of these

(74) The magnitude of static friction is:
* Always less than the kinetic friction
* Always greater than kinetic friction
* Equal to kinetic friction
* Sometime smaller and sometime greater than the kinetic friction

(75) The correct relation of μ is: **[2005 F]**
* $\mu = R/f$ * $\mu = f/R$ * $\mu = \frac{1}{R} f$ * $\mu = fR$

(76) When a body slides over a surface, the kinetic friction (f_k) and static friction (f_s) are related: **[2003 P.E]**
* $fk < fs$ * $fs < fk$ * $fk = o$ * $fs = o$

(77) The ratio of kinetic friction to limiting static friction is:
* Zero * One * Less than one * Greater than one

(78) A body falling down through a fluid experiences a frictional force which is given by: **[2009 F, 2012]**
* Law of gravitation * Snell's law * Stoke's law * None of these

(79) The Property of fluids due to which they resist their flow is called:
* Static friction * Viscosity * Velocity * Co-efficient of friction

(80) Stoke's law holds good for: **[2009]**
* The bodies of all shapes
* Motion through non-viscous medium
* Motion through vacuum
* Motion through viscous medium

(81) Equation $F = 6 \pi \eta r v$ represents: **[2009 P.E, 2002 P.M, 2003 F, 2006, 2007]**
* Hooke's Law * Stoke's Law * Bragg's Law * Newton's Law

(82) Which of the following is the mathematical form of stokes law:
* $F = \eta r v$ * $F = \pi \eta r v$ * $F = 6 \pi v$ * $F = 6 \pi \eta r v$

(83) The unit of coefficient of friction in S.I unit is:
* Newton * Dyne * joule * None of these (No unit)

Inclined Plane:

(84) The acceleration of a body on a smooth inclined plane depends upon: [2009 F]
* Mass of a body * Weight of a body * Reaction of the plane* Angle of inclination

(85) When a body moves up a rough inclined plane, it is acted upon by:
* Two forces * One force * Three forces * Four forces

(86) A body is moving up a frictionless inclined plane surface at an angle of 45°. Its acceleration is given by: [2005 S]
* 6.93 m/s^2 * – 6.93 m/s^2 * 3.46 m/s^2 * – 3.46 m/s^2

(87) The acceleration of a body moving down a frictionless inclined plane at 30° will be: [2001, 2004]
* 4.9 m/s^2 * 9.8 m/s^2 * 980 m/s^2 * 98 m/s^2

ANSWER KEY

1. Displacement	**2.** Displacement	**3.** Meter
4. Speed	**5.** Velocity	**6.** Average Velocity
7. Instantaneous	**8.** Uniform Velocity	**9.** Speed
10. $\frac{\Delta \vec{r}}{\Delta t}$	**11.** 4 m/s	**12.**
13. Uniform Velocity	**14.** Variable Velocity	**15.** Meter / Second
16. LT^{-1}	**17.** Acceleration	**18.** Uniform Acceleration
19. Instantaneous Acceleration	**20.** Uniform Acceleration	**21.** Positive Acceleration
22. Retardation	**23.** m/s^2	**24.** LT^{-2}
25. Changing Acceleration	**26.** Zero	**27.** 2 m/s^2
28. 18 m/s	**29.** 0.092 m/s^2	**30.** $t = \frac{v_f + v_i}{a}$
31. $a = \frac{v_f^2 + v_i^2}{2S}$	**32.** $\frac{1}{2} a t^2$	**33.** Weight
34. 19.6m	**35.** 14 m/s	**36.** 4.9 m
37. 4.9 m	**38.** Zero	**39.** 196 N
40. Force and acceleration	**41.** Law of inertial	**42.** Its mass
43. Acceleration	**44.** Third	**45.** a = F/m
46. one-half	**47.** Dyne	**48.** Force
49. Zero	**50.** 0.98 N	**51.** 50 N
52. 1 Kg	**53.** 3920 N	**54.** $a = \left(\frac{m_1 - m_2}{m_1 + m_2}\right) g$
55. $T = \frac{2 m_1 m_2 g}{m_1 + m_2}$	**56.** Tension	**57.** Newton
58. Opposite direction of applied force	**59.** 100 N	**60.** Momentum
61. N.S	**62.** Momentum	**63.** 500 N.S
64. Momentum	**65.** Velocity less then that of the Bullet	**66.** FΔt
67. Both momentum and K.E are conserved	**68.** Momentum conserved only	**69.** Momentum
70. Zero	**71.** rebound with the same velocity	**72.** The light ball
73. All of these	**74.** Always greater then kinetic Friction	**75.** $\mu = f/R$
76. $f_k < f_s$	**77.** Less than one	**78.** Stoke's law
79. Velocity	**80.** Motion through viscous Medium	**81.** Stoke's law
82. $F = 6 \pi \eta r v$	**83.** None of these (No unit)	**84.** Angle of inclination
85. Four forces	**86.** – 6.93 m/s^2	**87.** 4.9 m/S^2

MULTIPLE CHOICE QUESTIONS (MCQs):

(1) Body thrown at some angle θ above or below the horizontal and moves freely under the action of gravity is called:
* Rocket * Bullet * Airship * Projectile

(2) The path of a projectile is called its:
* Curve * Time of action * Orbit * Trajectory

(3) The path describe by a projectile represents a:
* Hyperbola * Parabola * Straight line * Circle

(4) The time taken by a projectile to reach its maximum height is:
* $t = \frac{V_o \sin\theta}{g}$ * $t = \frac{V_o \cos\theta}{g}$ * $t = \frac{V_o \sin\theta \cos\theta}{g}$ * $t = \frac{2V_o \sin\theta}{g}$

(5) The maximum height attained by a projectile is:
* $H = \frac{V_o^2 \sin^2\theta}{g}$ * $H = \frac{V_o^2 \cos^2\theta}{2g}$ * $H = \frac{V_o^2 \sin^2\theta}{2g}$ * $H = \frac{V_o^2 \sin\theta}{2g}$

(6) The horizontal range of a projectile be found by the formulas:
* $R = \frac{V_o^2 \sin^2\theta}{2g}$ * $R = \frac{V_o^2 \sin 2\theta}{2g}$ * $R = \frac{V_o^2 \sin 2\theta}{g}$ * $R = \frac{V_o^2 \cos^2\theta}{g}$

(7) The total time taken by a projectile from starting at the surface of the earth to landing again on it is given by:
* $T = \frac{V_o \sin\theta}{2g}$ * $T = \frac{2V_o \sin\theta}{g}$ * $T = \frac{2V_o \cos\theta}{2g}$ * $T = \frac{2V_o \sin^2}{2g}$

(8) Due to presence of air resistance the total time of flight of a projectile:
* Remains the same * Decreases * Becomes zero * Increases

(9) A projectile is fired with initial velocity of 90m/s to hit a ground level target its maximum horizontal range will be:
* 9.2m * 826.5m * 413m * 81m

(10) In projectile motion a body moves with:
* Constant vertical component of velocity * Constant horizontal component of velocity
* Both Changing horizontal and vertical component of velocity
* Vertical component changing but Horizontal component of velocity constant

(11) If a projectile is launched at 45° with velocity 100m/s it hits the target. It will have double the range if its velocity is:
* 141.4m/s * 200m/s * 173.2m/s * 400m/s

(12) If a projectile is thrown at an angle of 35° it hit a centrain target. It will have the same range if it is thrown at an angle of:
* 45° * 55° * 10° * 70°

(13) Maximum height of a projectile depends on:
* Angle of projection * Velocity of projection * Both angle and velocity * None of these

(14) During the projectile motion the acceleration along the horizontal direction:
* Decreases * Is zero * Increases * None of these

(15) The projectile motion is a superposition of:
* Circular motion * One diomentional motion * SHM * None of these

(16) A projectile which is fired horizontally has its speed maximum at the moment of:
* Projection * Hitting the ground * Both of these * None of these

(17) The range of a projectile is maximum when the factor Sin 2θ is equal:
* 0 * 1 * 45 * 90

(18) An angle subtending at its centre by an arc whose length is equal to its radius is:
* 37.3° * 47.3° * 57.3° * 67.3°

(19) Two projectiles A and B are thrown up with the some speed at an angle of 60° and 30° respectively with the horizontal then:
* The range of A will be greater * The range of B will be greater
* The range of A and B will be same * The range independent of the angle

(20) In a projectile motion the velocity with remains the same is:
* Velocity * Horizontal velocity * Vertical velocity * Terminal velocity

(21) An aircraft takes off at 30° with 500km/h it vertial component of velocity with:
* 500 km/h * 433 km / h * 250 km /h * Zero

(22) A projectile must be Launched to maximum range at an angle of:
* 60° * 45° * 30° * 90°

(23) Circular motion is an example of motion in:
* One dimension * Two dimension * Three dimension * No dimension

(24) In uniform circular motion, the acceleration is always directed:
* The centre * The tangent
* Between the these tangent and the normal * None of these

(25) The number of radians in a complete circle is:
* 360 * 180 * π * 2π

(26) The relation between time period end angular velocity is:
* $\omega = 2\pi T$ * $\omega = \frac{2\pi}{T}$ * $\omega = \frac{J}{2\pi}$ * $\omega = \frac{2T}{\pi}$

(27) If 'r' is the radius of the circular path of a particle its liner and angular velocities are:
* $\vec{v} = \vec{\omega} \times \vec{r}$ * $\vec{v} = \vec{\alpha} \times \vec{\omega}$ * $\vec{\omega} = \vec{v} \times \vec{r}$ * $\vec{\omega} = \vec{r} \times \vec{v}$

(28) The centripetal acceleration of a body moving along a circle is:
* $\frac{4Tr^2}{\pi^2}$ * $\frac{4\pi^2 r}{T^2}$ * $\frac{4r^2T^2}{\pi^2}$ * $\frac{4\pi^2}{T^2 r}$

(29) A body is moving along a circle with an increasing speed it possesses:
* Tangential acceleration only (at) * Centripetal acceleration only (a_c)
* Both tangential and centripetal acceleration * No acceleration

(30) The angle between centripetal acceleration and tangential acceleration is:
* 0° * 90° * 180° * 45°

(31) One radian is equal to:
* 1° * 35.7° * 57.3° * 0.017°

(32) S.I unit of angular velocity is:
* m/see * Radian/sec * Deg/see * Rev./see

(33) When a body moves along circumference of a circle with uniform speed, change take place is its:
* Linear velocity * Tangential acceleration * Both * None of these

(34) If r is the radius of the circular path of a particle its linear acceleration ($\vec{\alpha}$) are related by:
* $\vec{a} = \vec{\alpha} \times \vec{r}$ * $\vec{a} = \vec{r} \times \vec{\alpha}$ * $\alpha = \vec{a} \times \vec{r}$ * $\vec{\alpha} = \vec{a} \times \vec{r}$

(35) The length of an arc subtending one radian at the centre of a circle of radius 0.5m is:
* 0.05m * 0.5m * 1 m * 0.15m

(36) A body moving along a circular path with an increasing speed possesses:
* Tangential acceleration only * Centripetal acceleration only
* Both tangential and centripetal acceleration * No acceleration

(37) If a body is rotating in a circle with a certain constant tangential speed it must have:
* Only centripetal acceleration * Only tangential acceleration
* Both centripetal and tangential acceleration * None of these

(38) If a body is moving is a circle of radius "γ" with the constant speed "V" the centripetal acceleration.
* $\frac{V}{\gamma}$ * $\frac{V^2}{\gamma}$ * $\frac{V}{\gamma^2}$ * $\frac{V^2}{\gamma^2}$

(39) Centripetal force is also called:
* Centrifugal force * Centre-Seeking force * Tangential force * None of these

(40) The force required to keep a body in circle motion is called:
* Orbital force * Centripetal force * Centrifugal force * Restoring force

(41) What is the centrifugal force acting on a mass of 20kg tied to one end of a sting 10m long and rotated at a speed of 1m/sec.
* 1N * 2N * 5N * 10N

(42) A cyclist cycling around a circular racing track skids because:
* The centripetal force upon him is less than the limiting friction
* The centripetal force upon him is greater than the limiting friction
* The centripetal force upon him is equal to the limiting friction * None of these

(43) When angular velocity of a disk increases angular acceleration α and angular velocity ω are.
* parallel * Not parallel * perpendicular * None

(44) If the axis of rotation of a rotating body passes through the body itself, then its motion is called:
* Linear motion * Orbital motion * Spin motion * S.H motion

ANSWER KEY

(1) Projectile	(2) Trajectory	(3) Parabola	(4) $t = \frac{V_o \sin\theta}{g}$
(5) $H = \frac{V_o^2 \sin^2\theta}{2g}$	(6) $R = \frac{V_o^2 \sin 2\theta}{g}$	(7) $T = \frac{2V_o \sin\theta}{g}$	(8) Decreases
(9) 826.5m	(10) vertical component changing but Horizontal component of velocity constant	(11) 141.4m/s	(12) 55°
(13) Both angle and velocity	(14) Is zero	(15) None of these	(16) Both of these
(17) 1	(18) 57.3°	(19) The range of A and B will be same	(20) Horizontal velocity
(21) 250 km /h	(22) 45°	(23) Two dimension	(24) The centre
(25) 2π	(26) $\omega = \frac{2\pi}{T}$	(27) $\vec{v} = \vec{w} \times \vec{r}$	(28) $\frac{4\pi^2 r}{T^2}$
(29) Both tangential and centripetal acceleration	(30) 90°	(31) 57.3°	(32) Radian/see
(33) Linear velocity	(34) $\vec{a} = \vec{\alpha} \times \vec{r}$	(35) 0.5m	(36) Both tangential and centripetal acceleration
(37) Only centripetal acceleration	(38) $\frac{V^2}{r}$	(39) Centre-Seeking Force	(40) Centripetal force
(41) 2N	(42)	(43) parallel	(44) Spin motion