

QB365 Question Bank Software Study Materials

Laws of Motion 50 Important 1 Marks Questions With Answers (Book Back and Creative)

11th Standard

Physics

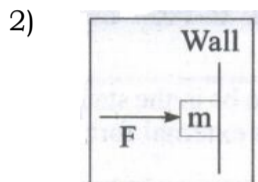
Total Marks : 50

Multiple Choice Question

50 x 1 = 50

1) When a car takes a sudden left turn in the curved road, passengers are pushed towards the right due to

- (a) **inertia of direction** (b) inertia of motion (c) inertia of rest (d) absence of inertia



An object of mass m held against a vertical wall by applying horizontal force F as shown in the figure. The minimum value of the force F is

- (a) Less than mg (b) Equal to mg (c) **Greater than mg** (d) Cannot determine

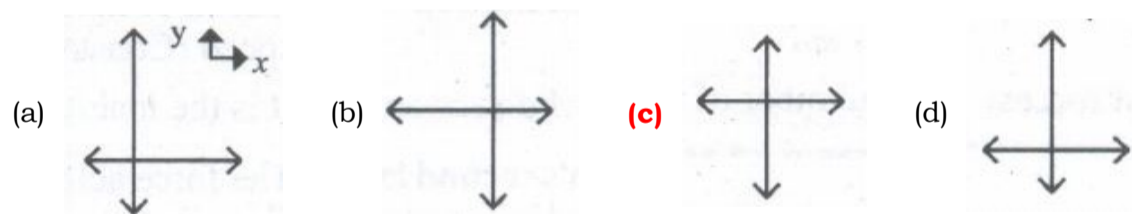
3) A vehicle is moving along the positive x direction, if sudden brake is applied, then

- (a) **frictional force acting on the vehicle is along negative x direction**
(b) frictional force acting on the vehicle is along positive x direction (c) no frictional force acts on the vehicle
(d) frictional force acts in downward direction

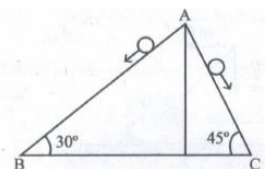
4) A book is at rest on the table which exerts a normal force on the book. If this force is considered as reaction force, what is the action force according to Newton's third law?

- (a) Gravitational force exerted by Earth on the book (b) Gravitational force exerted by the book on Earth
(c) **Normal force exerted by the book on the table** (d) None of the above

5) Choose appropriate free body diagram for the particle experiencing net acceleration along negative y direction. (Each arrow mark represents the force acting on the system).

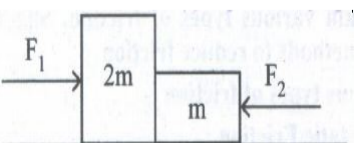


6) A particle of mass m sliding on the smooth double inclined plane (shown in figure) will experience



- (a) greater acceleration along the path AB (b) **greater acceleration along the path AC**
(c) same acceleration in both the paths (d) no acceleration in both the paths

7) Two blocks of masses m and $2m$ are placed on a smooth horizontal surface as shown. In the first case only a force F_1 is applied from the left. Later only a force F_2 is applied from the right. If the force acting at the interface of the two blocks in the two cases is same, then $F_1 : F_2$ is



- (a) 1:1 (b) 1:2 (c) **2:1** (d) 1:3

8) Force acting on the particle moving with constant speed is

- (a) always zero **(b) need not be zero** (c) always non zero (d) cannot be concluded
- 9) An object of mass m begins to move on the plane inclined at an angle θ . The coefficient of static friction of inclined surface is μ_s . The maximum static friction experienced by the mass is
- (a) mg (b) $\mu_s mg$ (c) $\mu_s mg \sin \theta$ **(d) $\mu_s mg \cos \theta$**
- 10) When the object is moving at constant velocity on the rough surface
- (a) net force on the object is zero** (b) no force acts on the object (c) only external force acts on the object
(d) only kinetic friction acts on the object
- 11) The centrifugal force appears to exist
- (a) only in inertial frames **(b) only in rotating frames** (c) in any accelerated frame
(d) both in inertial and non-inertial frames
- 12) Choose the correct statement from the following
- (a) Centrifugal and centripetal forces are action reaction pairs (b) Centripetal forces is a natural force
(c) Centrifugal force arises from gravitational force
(d) Centripetal force acts towards the center and centrifugal force appears to act away from the center in a circular motion.
- 13) If a person moving from pole to equator, the centrifugal force acting on him
- (a) increases** (b) decreases (c) remains the same (d) increases and then decreases
- 14) Two masses m_1 and m_2 are experiencing the same force where $m_1 < m_2$. The ratio of their acceleration $\frac{a_1}{a_2}$ is
- (a) 1 (b) less than 1 **(c) greater than 1** (d) all the three cases
- 15) When an object is at rest on the inclined rough surface,
- (a) static and kinetic frictions acting on the object is zero (b) static friction is zero but kinetic friction is not zero
(c) static friction is not zero and kinetic friction is zero (d) static and kinetic frictions are not zero
- 16) A car when passes through a bridge exerts a force on it which is equal to _____.
- (a) $mg + \frac{Mv^2}{r}$ (b) $\frac{Mv^2}{r}$ **(c) $mg - \frac{Mv^2}{r}$** (d) none
- 17) When milk is churned, cream gets separated due to _____.
- (a) Centripetal force **(b) Centrifugal force** (c) Frictional force (d) Gravitational force
- 18) A machine gun has mass 15 kg. It fires 15 g bullet at the rate of 200 bullets per minutes with a speed of 150 m/s. Then the recoil velocity of the gun is _____.
- (a) 20 ms^{-1} (b) 15 ms^{-1} (c) 150 ms^{-1} **(d) 0.2 ms^{-1}**
- 19) A batsman hits a ball straight in the direction of the bowler without change in its initial speed of 10 ms^{-1} . If the mass of the ball is 200 g, then change in momentum of the ball is _____.
- (a) 5 kg ms^{-1} (b) 6 kg ms^{-1} **(c) 4 kg ms^{-1}** (d) 3 kg ms^{-1}
- 20) A force of 2.5 N acts on a body of mass 10 g. What is the acceleration of the body?
- (a) $1.5 \times 10^2 \text{ ms}^{-2}$ (b) $2.0 \times 10^3 \text{ ms}^{-2}$ **(c) $2.5 \times 10^3 \text{ ms}^{-2}$** (d) $3.0 \times 10^2 \text{ ms}^{-2}$
- 21) Which concept was given by Newton's first law of motion?
- (a) Force (b) Weight (c) Work **(d) Inertia**
- 22) Which of the following force tends to stop the moving object?
- (a) Frictional force** (b) Magnetic force (c) Gravitational force (d) Electric force

- 23) When is the speed of a moving body doubled?
 (a) its acceleration is doubled **(b) its momentum is doubled** (c) its kinetic energy is doubled
 (d) its potential energy is doubled
- 24) Change in momentum of a body is _____.
 (a) force (b) acceleration (c) work **(d) impulse**
- 25) A force system is said to be concurrent, if the lines of all forces _____.
(a) intersect at a common point (b) intersect at a common point in equal angles
 (c) intersect at a common point in common plane (d) none of these
- 26) If the heart pumps blood at the rate of M kg per unit time, with constant velocity ' v ' the force required is _____.
 (a) $\frac{M}{v}$ (b) Mv^2 (c) M^2v **(d) Mv**
- 27) A particle of mass m is moving with a uniform velocity v_1 . It is given an impulse such that its velocity becomes v_2 . The impulse is equal to _____.
 (a) $m[|v_2| - |v_1|]$ (b) $\frac{1}{2}m[v_2^2 - v_1^2]$ (c) $m[v_1 + v_2]$ **(d) $m[v_2 - v_1]$**
- 28) The concept "force causes motion" was given by _____.
 (a) Galileo **(b) Aristotle** (c) Newton (d) Joule
- 29) According to Newton's third law _____.
(a) $F_{12} = F_{21}$ (b) $F_{12} = -F_{21}$ (c) $F_{12} + F_{21} = 0$ (d) $F_{12} \times F_{21} = 0$
- 30) The law which is valid in both inertial and non-inertial frame is _____.
 (a) Newton's first law (b) Newton's second law **(c) Newton's third law** (d) none
- 31) The action and reaction forces acting on _____.
 (a) same body **(b) different bodies** (c) either same or different bodies (d) none of the above
- 32) If same force is acting on two masses m_1 and m_2 , and the accelerations of two bodies are a_1 and a_2 respectively, then _____.
 (a) $\frac{a_2}{a_1} = \frac{m_2}{m_1}$ (b) $\frac{a_1}{a_2} = \frac{m_1}{m_2}$ **(c) $\frac{a_1}{a_2} = \frac{m_2}{m_1}$** (d) $m_1 a_1 + m_2 a_2 = 0$
- 33) A block of mass m_1 is pulled along a horizontal frictionless surface by a rope of mass m_2 . If a force F is given at its free end. The net force acting on the block is _____.
 (a) $\frac{m_1 F}{m_1 - m_2}$ **(b) F** (c) $\frac{m_2 F}{(m_1 + m_2)}$ (d) $\frac{m_1 F}{(m_1 + m_2)}$
- 34) When the object is at rest the resultant of gravitational force and upward normal force is _____.
 (a) Static force **(b) zero** (c) one (d) infinity
- 35) Kinetic friction is also called as _____.
 (a) sliding friction (b) dynamic friction **(c) both (a) and (b)** (d) static friction
- 36) The nature of materials in mutual contact decides _____.
 (a) μ_s (b) μ_k **(c) μ_s or μ_k** (d) none
- 37) The static friction _____.
(a) increases linearly (b) is constant (c) zero (d) varies parabolically
- 38) The kinetic friction _____.
 (a) increases linearly **(b) is constant** (c) zero (d) varies parabolically

- 39) The origin of the centripetal force can be _____.
- (a) gravitational force (b) frictional force (c) coulomb force (d) **all the above**
- 40) Centrifugal force is a _____.
- (a) **pseudo force** (b) real force (c) forced acting towards centre (d) none of the above
- 41) A constant retarding force of 50 N is applied to a body of mass 20 kg moving initially with a speed of 15ms^{-1} . How long does the body take to stop?
- (a) 0.75 s (b) 1.33 s (c) **6 s** (d) 35 s
- 42) A box is lying on an inclined plane what is the coefficient of static friction if the box starts sliding when an angle of inclination is 60°
- (a) 1.173 (b) **1.732** (c) 2.732 (d) 1.677
- 43) A particle of mass M is pulled along a horizontal frictionless surface by a rope of mass m. Force P is applied at one end of the rope. The force that the rope exerts on the block is
- (a) $\frac{PM}{m+M}$ (b) $\frac{P}{M-m}$ (c) $\frac{Pm}{M+m}$ (d) $\frac{Pm}{M-m}$
- 44) A rectangular body is at rest by pressing it against a vertical wall. It is due to the required pressing force is
- (a) **greater than weight of the body** (b) lesser than weight of the body (c) equal to the weight of the body
(d) none of the above
- 45) If two masses of A and B of 5 kg and 2 kg are connected by a string passing over a pulley. The acceleration of the system is
- (a) $\frac{1}{7}g$ (b) $\frac{7}{3}g$ (c) **$\frac{3}{7}g$** (d) $\frac{2}{7}g$
- 46) If a force $\vec{F} = (6\hat{i} + 8\hat{j} + 10\hat{k})$ N produces an acceleration of 1 m/s^2 then the mass of the body is
- (a) 10 kg (b) 20 kg (c) **$10\sqrt{2}\text{kg}$** (d) $2\sqrt{2}\text{kg}$
- 47) A body of mass 2 kg is tied with a string of length 1m. If the maximum tension acting on the string is 200 N then the minimum speed that the body can have during the whirling motion is
- (a) 100 m/s (b) 2 m/s (c) 20 m/s (d) **10 m/s**
- 48) A pseudo force has
- (a) two origins (b) one origin (c) **no origins** (d) none of the above
- 49) A box weighing 20 N is moved along a horizontal surface through a distance of 25 m. If the coefficient of friction is 0.4, then the work done against friction is
- (a) **200 J** (b) 250 J (c) 100 J (d) 50 J
- 50) An electric lift with a maximum load of 2000 kg (lift + passengers) is moving up with a constant speed of 1.5 ms^{-1} . The frictional force opposing the motion is 3000 N. The minimum power delivered by the motor to the lift in watts is : ($g = 10\text{ m s}^{-2}$)
- (a) 23000 (b) 20000 (c) **34500** (d) 23500