



MOTION AND FORCE

Each question has four possible answers, encircled the correct answer:

1. If a body changes its position with respect to its surroundings then it is said to be in:
(a) Rest (b) Motion
(c) Momentum (d) Force
2. If a body does not change its position with respect to its surroundings then it is said to be at:
(a) Rest (b) Motion
(c) Momentum (d) Force
3. The change in position of a body from initial to final position is called:
(a) Velocity (b) Displacement
(c) Acceleration (d) Speed
4. The rate of change of displacement is called:
(a) Velocity (b) Displacement
(c) Acceleration (d) Speed
5. The rate of change of distance is called:
(a) Velocity (b) Displacement
(c) Acceleration (d) Speed
6. The SI unit of velocity is:
(a) m/s (b) m-s
(c) s/m (d) None of these
7. The dimensions of velocity are:
(a) $[LT^2]$ (b) $[L^{-1}]$
(c) $[LT^{-1}]$ (d) $[L^2T]$
8. The expression $\text{Limit}_{\Delta t \rightarrow 0} \frac{\Delta \vec{d}}{\Delta t}$ represents:
(a) Average velocity (b) Displacement
(c) Instantaneous velocity (d) Acceleration
9. If the velocity of the body is increasing then its acceleration will be:
(a) Zero (b) Maximum
(c) Negative (d) Positive

10. The rate of change of velocity is called:
(a) Displacement (b) Velocity
(c) Speed (d) Acceleration
11. When the velocity of a body is increases at constant rate, it is said to be moving with:
(a) Constant velocity (b) Constant speed
(c) Constant displacement (d) None of these
- 12.☞ With the help of velocity-time graph, we can find:
(a) Distance (b) Time
(c) Velocity (d) Momentum
- 13.☞ The area under the curve of velocity-time graph gives:
(a) Acceleration (b) Velocity
(c) Distance (d) Direction
14. The motion and rest are:
(a) Relative (b) Discrete
(c) Absolute (d) None of these
15. When a body moves in straight line, displacement is:
(a) Circular (b) Curved
(c) Along the path (d) None of these
16. If the instantaneous velocity does not change, then the body is said to be moving with:
(a) Average velocity (b) Average acceleration
(c) Uniform velocity (d) Average speed
17. A man on the top of a tower throws an object upward with a certain velocity and allows another object to fall freely. The two objects strikes the Earth with:
(a) Different velocities (b) Same velocities
(c) Uniform velocities (d) None of these
18. If the velocity time graph becomes steeper and steeper then acceleration:
(a) Remains constant (b) Decreases
(c) Increases (d) None of these
19. Acceleration of a body sliding down a smooth inclined plane of constant angle is said to be:
(a) Variable (b) Increasing
(c) Decreasing (d) Constant
20. The dimensions of acceleration are:
(a) $[LT^{-1}]$ (b) $[LT^2]$
(c) $[L^2T]$ (d) $[LT^{-2}]$

21. Slope of velocity-time graph represents:
- (a) Distance (b) Displacement
(c) Acceleration (d) None of these
22. A paratrooper moves downward with:
- (a) Zero acceleration (b) Negative acceleration
(c) Positive acceleration (d) Acceleration due to gravity
23. If a body is moving with constant velocity of 20 m/s towards North then its acceleration is:
- (a) 5 m/s^2 (b) 9 m/s^2
(c) 10 m/s^2 (d) Zero
24. Acceleration in a body is always produced in the direction of:
- (a) Force (b) Velocity
(c) Weight (d) None of these
25. The velocity of a body at any instant of time is called:
- (a) Average speed (b) Uniform velocity
(c) Instantaneous velocity (d) None of these
26. The unit of acceleration in SI unit is:
- (a) m/s (b) m/s^2
(c) m-s (d) $\frac{1}{\text{m-s}^2}$
27. If a body covers equal displacement in equal interval of time then velocity of the body is:
- (a) Uniform (b) Average
(c) Instantaneous (d) None of these
28. If a body covers unequal displacement in unequal interval of time then velocity of the body is:
- (a) Uniform (b) Variable
(c) Instantaneous (d) None of these
29. The acceleration of a body at a particular instant of time is:
- (a) Uniform acceleration (b) Variable acceleration
(c) Instantaneous acceleration (d) None of these
30. Graphs which are used to describe the variation of velocity with time are called:
- (a) Speed-time graph (b) Velocity-time graph
(c) Distance-time graph (d) None of these
31. If a body is moving with constant acceleration then the velocity-time graph is:
- (a) Parabola (b) Hyperbola
(c) Straight line (d) None of these

32. In displacement-time graph, if the slope of line increases then:
- (a) The acceleration increases (b) The velocity becomes greater
(c) The speed decreases (d) None of these
33. The average and instantaneous accelerations will be equal when a body moves with:
- (a) Constant acceleration (b) Variable acceleration
(c) Retardation (d) Positive acceleration
34. A frame of reference at rest is called:
- (a) Non-inertial frame (b) Inertial frame
(c) Accelerated frame (d) None of these
35. Those frame of references which are moving with some acceleration is called:
- (a) Non-inertial frame (b) Inertial frame
(c) Both (a) and (b) (d) None of these
36. If $\vec{\Delta V}$ is the change in the velocity of a body during time Δt , then its acceleration is given by:
- (a) $\vec{a} = \frac{\vec{\Delta x}}{\Delta t}$ (b) $\vec{a} = \frac{\Delta t}{\vec{\Delta V}}$
(c) $\vec{a} = \frac{\vec{\Delta V}}{\Delta t}$ (d) $\vec{a} = \vec{\Delta V} \cdot \Delta t$
37. The laws of motion shows the relation between:
- (a) Distance and velocity (b) Displacement and velocity
(c) Mass and velocity (d) Force and acceleration
38. The quantity of matter in a body is called:
- (a) Force (b) Mass
(c) Displacement (d) Speed
39. Newton's first law of motion is also called:
- (a) Law of inertia (b) Law of momentum
(c) Ampere's law (d) None of these
40. The property of a body due to which it opposes its state of rest or of motion is called:
- (a) Momentum (b) Torque
(c) Weight (d) Inertia
41. Laws of motion are valid in a frame which is:
- (a) In motion (b) Inertial
(c) Both (a) and (b) (d) None of these

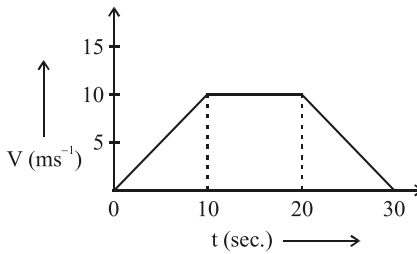
42. Laws of motion are not valid in a frame which is:
- (a) Inertial (b) Non-inertial
(c) In the space (d) None of these
43. Newton's laws are applicable on the objects which have:
- (a) High speed and light mass (b) Low speed and light mass
(c) Low speed and heavy mass (d) None of these
44. The magnitude of acceleration produced in an object is inversely proportional with:
- (a) Momentum (b) Velocity
(c) Mass (d) Applied force
45. The SI unit of force is:
- (a) Newton (b) Kilogram
(c) Joule (d) Metre
46. The force which produces an acceleration of 1 m/s^2 in an object of mass 1 kg is equal to:
- (a) One Ampere (b) One Watt
(c) One Newton (d) One Coulomb
47. If the force acting on a body is doubled, then acceleration becomes:
- (a) Half (b) Constant
(c) One forth (d) Double
48. A mass of 10 kg moves with an acceleration of 10 m/s^2 , the force on it is:
- (a) 5 N (b) 100 N
(c) 50 N (d) 25 N
49. Inertia of a body is measured in terms of its:
- (a) Weight (b) Force
(c) Mass (d) Acceleration
50. The rate of change of momentum is equal to:
- (a) Applied force (b) Torque
(c) Distance (d) Time
51. The product of mass and velocity is called:
- (a) Impulse (b) Momentum
(c) Force (d) Power
52. The expression $\vec{I} = \vec{F} \times \Delta t$ represents:
- (a) Momentum (b) Impulse
(c) Force (d) Power

53. Impulse is equal to the:
- (a) Change in momentum (b) Change of force
(c) Change of time (d) Change of velocity
54. The dimensions of weight are:
- (a) $[LT^{-1}]$ (b) $[MLT^{-2}]$
(c) $[M^2LT]$ (d) $[ML^2T]$
55. SI unit of impulse is:
- (a) kg m/s (b) N-m
(c) Ns (d) None of these
56. The motion of the rocket in the space is according to the law of conservation of:
- (a) Energy (b) Mass
(c) Linear momentum (d) None of these
57. A force of 100 N acts in a body for 5 seconds, what will be the change in momentum:
- (a) 20 N-s (b) 500 N-s
(c) 100 N-s (d) 1000 N-s
58. A body thrown upward making an angle with the horizontal and moving freely under the action of gravity is called:
- (a) Linear motion (b) Projectile motion
(c) Both (a) and (b) (d) None of these
59. The path followed by the projectile is called:
- (a) Height of projectile (b) Range of projectile
(c) Trajectory (d) None of these
60. During projectile motion, the horizontal component of velocity:
- (a) Remains constant (b) Increases
(c) Decreases (d) Becomes zero
61. The trajectory of a projectile is:
- (a) Circle (b) Parabola
(c) Hyperbola (d) Straight line
62. The vertical component of velocity at highest point during projectile motion is:
- (a) Maximum (b) Constant
(c) Zero (d) Same
63. A foot ball kicked in a air is the example of:
- (a) Linear motion (b) Circular motion
(c) Rotational motion (d) Projectile motion
64. The acceleration along x-direction in case of projectile is:
- (a) Zero (b) Equal to gravity
(c) Maximum (d) Constant

65. Motion of a projectile is:
- (a) One dimension (b) Two dimension
(c) Three dimension (d) None of these
66. Initial vertical velocity of a projectile is given by:
- (a) $v_i \cos \theta$ (b) $v_i \sin \theta$
(c) $v_i^2 \sin \theta$ (d) $v_i \tan \theta$
67. The magnitude of the velocity of the projectile is:
- (a) $v = \sqrt{v_x^2 + v_y^2}$ (b) $v = \sqrt{v_x^2 - v_y^2}$
(c) $v = v_x^2 + v_y^2$ (d) None of these
68. The expression for maximum height is:
- (a) $\frac{v_i^2 \sin^2 \theta}{2g}$ (b) $\frac{v_i^2 \sin \theta}{g}$
(c) $\frac{v_i \sin^2 \theta}{2g}$ (d) $\frac{v_i \sin \theta}{2g}$
69. The SI unit of acceleration is:
- (a) ms^2 (b) m/s^2
(c) m^2s (d) None of these
70. The horizontal component of velocity of a projectile thrown with initial velocity 300 m/s at an angle of 90° will be:
- (a) 450 m/s (b) 200 m/s
(c) 150 m/s (d) Zero
71. Height attained by the projectile will be maximum when the angle of projection is:
- (a) 30° (b) 60°
(c) 45° (d) 90°
72. Velocity of the projectile at the maximum height attained when projected with velocity v_i is:
- (a) $v_x = v_i \sin \theta$ (b) $v_H = v_i \cos \theta$
(c) Zero (d) v_i
73. A body falling freely strikes the ground in 5 seconds, distance covered by it in 5 second is:
- (a) 122.5 m (b) 25 m
(c) 24.5 m (d) 34.5 m
74. The total time for which the projectile remains in air is called:
- (a) Time of projectile (b) Time period
(c) Time of flight (d) Time constant

75. The time of flight is given by:
- (a) $\frac{2v_i \sin \theta}{g}$ (b) $\frac{v_i \sin \theta}{g}$
(c) $\frac{v_i^2 \sin \theta}{2g}$ (d) $\frac{v_i \sin \theta}{2g}$
76. The angle of projection to cover maximum horizontal range is:
- (a) 90° (b) 120°
(c) 18° (d) 45°
77. The expression for maximum range of projectile is given by:
- (a) $\frac{v_i^2}{g}$ (b) $\frac{2v_i}{g}$
(c) $\frac{2v_i^2}{g}$ (d) $\frac{v_i^2}{2g}$
78. The path followed by the ballistic missile is called:
- (a) Missile displacement (b) Ballistic trajectory
(c) Missile acceleration (d) Ballistic time
79. ¶ The ballistic missiles are useful only for:
- (a) Long range (b) Vertical range
(c) Short range (d) Normal range
80. ¶ For long range, the missiles used are called:
- (a) Long range missiles (b) Normal missiles
(c) Guided missiles (d) Rocket missiles
81. An object can have a constant speed even its velocity is:
- (a) Constant (b) Changing
(c) Zero (d) Maximum
82. The system in which no external force acts called:
- (a) Inertial system (b) Isolated system
(c) Non-material system (d) Thermal system
83. When there is no loss of K.E and momentum then the collision is called:
- (a) Elastic collision (b) In-elastic collision
(c) Inertial collision (d) None of these
84. The ballistic trajectory is the path followed by:
- (a) The powered guided missile (b) An un-powered and guided missile
(c) An un-powered and un-guided missile (d) None of these
85. The range of projectile is directly proportional to the:
- (a) $\sin 2\theta$ (b) $\sin^2 \theta$
(c) $\cos^2 \theta$ (d) $\tan^2 \theta$

86. The magnitude of vertical and horizontal range will be equal if angle of projection is:
- (a) 120° (b) 45°
(c) 70° (d) 76°
87. A rocket propulsion is based on the principle of:
- (a) Law of conservation of mass (b) Law of conservation of energy
(c) Law of conservation of momentum (d) None of these
88. The path of projectile is determined by:
- (a) Magnetic field (b) Gravitational field
(c) Electric field (d) Electromagnetic field
89. The equation of parabola is:
- (a) $y = bx - ax^2$ (b) $y = ax - bx^2$
(c) Both (a) and (b) (d) None of these
90. In a projectile motion, the horizontal range R depends upon:
- (a) Angle of projection (b) Initial velocity
(c) Both (a) and (b) (d) None of these
91. The horizontal component of a projectile moving with initial velocity of 200 m/s at an angle of 60° to x-axis is:
- (a) 100 m/s (b) 250 m/s
(c) 50 m/s (d) 200 m/s
92. The velocity of projectile is maximum at:
- (a) Highest point (b) One fourth of height
(c) Half of height (d) Before striking the ground
93. Horizontal range of projectile is:
- (a) Equal to height (b) One fourth of height
(c) One half of height (d) Double of height
94. A force of 15 N acts on a body of mass 5 kg for 5 sec. to a distance of 10 cm, the rate of change of momentum is:
- (a) 75 N (b) 45 N
(c) 15 N (d) 30 N
95. A fighter plane is chasing another plane, when it opens fire its speed.
- (a) Increases (b) Decreases
(c) Remains same (d) It stops
96. If the horizontal range of a projectile is four times its maximum height, the angle of projection is:
- (a) 30° (b) 45°
(c) $\sin^{-1}\left(\frac{1}{4}\right)$ (d) $\tan^{-1}\left(\frac{1}{4}\right)$

97. A train covers the first half distance between two stations at a speed of 40 kmh^{-1} and the other half at 60 kmh^{-1} then its average speed is:
- (a) 45 kmh^{-1} (b) 48 kmh^{-1}
(c) 40 kmh^{-1} (d) None of these
98. During the projectile motion, the horizontal component of velocity.
- (a) Changes with time (b) Becomes zero
(c) Remains constant (d) Increases with time
99. A ball is projected at angle of 45° to the horizontal. If the horizontal range is 20 m, the maximum height to which the ball rises is:
- (a) 2.5 m (b) 5.0 m
(c) 7.5 m (d) 10 m
100. In the following velocity time graph, the distance travelled by the body in metres is:
- (a) 200
(b) 250
(c) 300
(d) 400
- 
101. Newton's first law of motion gives definition of:
- (a) Mass (b) Force
(c) Acceleration (d) Speed
102. Motion of rocket is based upon:
- (a) Newton's third law of motion (b) Law of conservation of momentum
(c) Newton's law of gravitation (d) Both (a) and (b)
103. The acceleration of projectile at the highest point is:
- (a) Zero (b) Increases
(c) Decreases (d) Constant
104. A force of 12 N gives an acceleration 4 ms^{-2} to an object. The force required to give it an acceleration of 10 ms^{-2} is:
- (a) 15 N (b) 20 N
(c) 25 N (d) 30 N
105. Acceleration of 1.5 ms^{-2} expressed in kmh^{-2} is:
- (a) 324 (b) 5.4
(c) 5400 (d) 19440
106. A bomb of mass 12 kg initially at rest, explodes into two pieces of masses 4 kg and 8 kg. The speed of the 8 kg mass is 6 ms^{-1} . The K.E of the 4 kg mass is:
- (a) 32 J (b) 48 J
(c) 114 J (d) 288 J

107. The range of projectile when launched at an angle of 15° with the horizontal is 1.5 m. Its range, when launched at 45° with the same speed is:
- (a) 3.0 m (b) 1.5 m
(c) 6.0 km (d) 0.75 km
108. For a projectile, the ratio of maximum height reached to the square of flight time is:
- (a) 5 : 4 (b) 5 : 2
(c) 5 : 1 (d) 10 : 1
109. A stone is thrown vertically upward with a velocity of 30 ms^{-1} . If the acceleration due to gravity is 10 ms^{-2} , what is the distance travelled by the particle during the first second of its motion.
- (a) 30 m (b) 25 m
(c) 10 m (d) None of these
110. A body is dropped from a tower with zero velocity reaches ground in 4 seconds. The height of the tower is about:
- (a) 80 m (b) 20 m
(c) 160 m (d) 40 m
111. A body starting from rest covers a distance of 0.45 km and acquires a velocity of 300 km/h. Its acceleration will be:
- (a) 0.092 ms^{-2} (b) 0.5 ms^{-2}
(c) 7.71 ms^{-2} (d) 0.15 ms^{-2}
112. The distance covered by a body in time 't' starting from rest is:
- (a) $\frac{at^2}{2}$ (b) vt
(c) $\frac{a^2t}{2}$ (d) at^2
113. At what angle, the range and maximum range are equal?
- (a) 45° (b) 90°
(c) 60° (d) 0°
114. A cricket ball is hit so that it travels straight up in air and it can acquires 3 seconds to reach the maximum height. Its initial velocity is:
- (a) 10 ms^{-1} (b) 15 ms^{-1}
(c) 29.4 ms^{-1} (d) 12.2 ms^{-1}
115. A bullet of mass 10 g hits a target and penetrates 2 cm into it. If the average resistance offered by the target is 100 N then the velocity with which the bullet hits the target is:
- (a) 10 ms^{-1} (b) 1052 ms^{-1}
(c) 20 ms^{-1} (d) $20\sqrt{2} \text{ ms}^{-1}$

ANSWERS

1.	(b)	2.	(a)	3.	(b)	4.	(a)
5.	(d)	6.	(a)	7.	(c)	8.	(c)
9.	(d)	10.	(d)	11.	(a)	12.	(a)
13.	(a)	14.	(a)	15.	(c)	16.	(c)
17.	(a)	18.	(c)	19.	(d)	20.	(d)
21.	(c)	22.	(a)	23.	(d)	24.	(a)
25.	(c)	26.	(b)	27.	(a)	28.	(b)
29.	(c)	30.	(b)	31.	(c)	32.	(b)
33.	(a)	34.	(b)	35.	(a)	36.	(c)
37.	(d)	38.	(b)	39.	(a)	40.	(d)
41.	(b)	42.	(b)	43.	(c)	44.	(c)
45.	(a)	46.	(c)	47.	(d)	48.	(b)
49.	(c)	50.	(a)	51.	(b)	52.	(b)
53.	(a)	54.	(b)	55.	(c)	56.	(c)
57.	(a)	58.	(b)	59.	(c)	60.	(a)
61.	(b)	62.	(c)	63.	(d)	64.	(a)
65.	(b)	66.	(b)	67.	(a)	68.	(a)
69.	(b)	70.	(d)	71.	(c)	72.	(c)
73.	(a)	74.	(c)	75.	(a)	76.	(d)
77.	(a)	78.	(b)	79.	(c)	80.	(c)
81.	(b)	82.	(b)	83.	(a)	84.	(c)
85.	(a)	86.	(d)	87.	(c)	88.	(b)
89.	(b)	90.	(c)	91.	(a)	92.	(a)
93.	(a)	94.	(c)	95.	(b)	96.	(b)
97.	(b)	98.	(c)	99.	(b)	100.	(a)
101.	(b)	102.	(d)	103.	(d)	104.	(d)
105.	(d)	106.	(d)	107.	(a)	108.	(a)
109.	(b)	110.	(a)	111.	(c)	112.	(a)
113.	(a)	114.	(c)	115.	(c)		