Motion

Q.1: m/s^2 is the SI unit of -
(a) distance
(b) displacement
(c) velocity
(d) acceleration.

Q.2: A car goes from a town A to another town B with a speed of 40 km/h and returns back to the town A with a speed of 60 km/h. The average speed of the car during the complete journey is -
(a) 48 km/h
(b) 50 km/h
(c) zero
(d) none of these.

Q.3: The rate of change of displacement with time is called -
(a) speed
(b) velocity
(c) acceleration
(d) retardation

Q.4: The initial velocity of a body is *u*. It is under uniform acceleration *a*. Its velocity *v* at any time *t* is given by -
(a) $v = u + at^2$
(b) $v = u + \frac{1}{2} at^2$
(c) $v = u + at$
(d) $v = u$.

Q.5: The distance covered in time *t* by a body having initial velocity *u* and having a uniform acceleration *a* is given by $s = ut + \frac{1}{2} at^2$. This result follows from -
(a) Newton's first law
(b) Newton's second law
(c) Newton's third law
(d) None of these.

Q.6: A ball is thrown vertically upwards. It rises to a height of 50 m and comes back to the thrower,
(a) the total distance covered by the ball is zero.
(b) the net displacement of the ball is zero.
(c) the displacement is 100 m.
(d) none of these.

Q.7: In 12 minutes a car whose speed is 35 km/h travels a distance of
(a) 7 km
(b) 3.5 km
(c) 14 km
(d) 28 km

Q.8: When a graph of one quantity versus another results in a straight line, the quantities are
(a) both constant
(b) equal
(c) directly proportional
(d) inversely proportional

Q.9: A body moving along a straight line at 20 m/s undergoes an acceleration of -4 m/s^2. After two seconds its speed will be -
(a) -8 m/s
(b) 12 m/s
(c) 16 m/s
(d) 28 m/s.

Q.10: A car increases its speed from 20 km/h to 30 km/h in 10 seconds. Its acceleration is
(a) 30 m/s^2
(b) 3 m/s^2
(c) 18 m/s^2
(d) 0.83 m/s^2

Q.11: A body whose speed is constant
(a) must be accelerated
(b) might be accelerated
(c) has a constant velocity
(d) can not be accelerated.

Q.12: When the distance that an object travels is directly proportional to the length of time it is said to travel with
(a) zero velocity
(b) constant speed
(c) constant acceleration
(d) uniform velocity

Q.13: a particle moves with uniform positive acceleration. Its velocity-time graph will be
(a) a straight line parallel to the time axis
(b) a straight line inclined at an obtuse angle to the time axis
(c) a straight line inclined at an acute angle to the time axis
(d) none of these.

Q.14: The slope of speed-time graph gives
(a) speed
(b) velocity
(c) acceleration
(d) momentum

Q.15: A particle experiences constant acceleration for 20 seconds after starting from rest. If it travels a distance s_1 in the first 10 seconds and distance s_2 in the next 10 seconds then,
(a) $s_2 = s_1$
(b) $s_2 = 2s_1$
(c) $s_2 = 3s_1$

(d) $s_2 = 4s_1$

Q.16: In which of the following cases the object does not possess an acceleration or retardation when it moves in
(a) upward direction with decreasing speed
(b) downward direction with increasing speed
(c) with constant speed along circular path
(d) with constant speed along horizontal path

Q.17: A person travels distance πR along the circumference of a circle of radius R. Displacement of the person is
(a) R
(b) 2R
(c) $2\pi R$
(d) zero

Q.18: The velocity of an object is directly proportional to the time elapsed. The object has
(a) uniform speed
(b) uniform velocity
(c) uniform acceleration
(d) variable acceleration

Answers: 1 - d. 2 - a. 3 - b. 4 - c. 5 - d. 6 - b. 7 - a. 8 - c. 9 - b. 10 - d. 11 - b. 12 - b 13 - c. 14 - c. 15 - c. 16 - d. 17 - b. 18 - c.

1 What we say when a body remains in one position for a long time?

A. motion
B. rest
C. stationary
D. none of the above

Ans: B

2 The act, process or state of the change in place or position of a body with respect to time and relative to the observer is said to be ....

A. rest
B. stationary
C. motion
D. none of the above

Ans: C

3 Which of the following is a type of motion ?
A. Circular
B. Rectilinear
C. Periodic
D. All the above

Ans: D

4 Which type of motion of an object that moves in a straight line ?
A. Rectilinear motion
B. Periodic motion
C. Circular motion
D. none of the above

Ans: A (a train moving on a track, a parade, coins tossed in the air are all in rectilinear motion.)

5 Which type of motion of an object that moves at a fixed distance from a fixed point ?

A. Periodic motion

B. Rectilinear motion
C. Circular motion
D. none of the above

Ans: C Circular motion is the motion of an object that moves at a fixed distance from a fixed point. Here, all objects rotate in circular motion

6 Which type of motion is "a train moving on a track " ?
A. Circular
B. rectilinear
C. Periodic
D. none of the above

Ans: B "Rectilinear motion is the motion of an object that moves in a straight line.

7 Which type of motion repeats itself at regular intervals of time?
A. Circular motion
B. Periodic motion
C. Rectilinear motion
D. none of the above

Ans: B Periodic motion is motion that repeats itself at regular intervals of time. Every body executing circular motion can be said to be executing periodic motion

8 Which type of motion is "The hands of a clock" ?
A. Circular
B. rectilinear
C. Periodic
D. none of the above

Ans: A Here, all objects rotate in circular motion

9 If an object moves along a straight path it is said to be .... motion
A. linear
B. one-dimensional
C. Both A and B
D. two-dimensional.

Ans: C If an object moves along a straight path it is said to be linear or one-dimensional motion

10 Which type of motion is "the pendulum of a wall clock moves at regular intervals" ?
A. rectilinear
B. Periodic
C. Circular
D. none of the above

Ans: B Periodic motion is motion that repeats itself at regular intervals of time. Every body executing circular motion can be said to be executing periodic motion

11 When a ball hit for a sixer in a cricket then it is in..............
A. linear
B. one-dimensional
C. two-dimensional.
D. three-dimensional

Ans: C

12 What is known as the change in position of an object?
A. displacement
B. speed
C. velocity
D. none of the above

Ans: A The change in position of an object is termed displacement

13 Which two factors displacement requires ?
A. magnitude
B. direction
C. Both A and B
D. none of the above
Ans: C It requires both direction and magnitude for its complete operation and hence such physical quantities are called a vectors

14 Give the hazard motion of a honey bee.
A. two-dimensional.
B. three-dimensional
C. linear
D. one-dimensional

Ans: B

15 The physical quantities used in displacement both direction and magnitude are called as:
A. vectors
B. scalars
C. S.I
D. C.G.S

Ans: A

16 What is mean by the rate of displacement of a body?
A. speed
B. acceleration
C. velocity
D. none of the above
Ans: C The rate of displacement of a body is its velocity and is measured in metre per second in international units.

17 Which velocity is known as "If unequal displacements in equal intervals of time is moving"
A. average velocity
B. instantaneous velocity
C. non-uniform velocity
D. none of the above

Ans: C

18 Which of the following physical quantities is independent of direction?

A. vectors
B. C.G.S
C. scalars
D. S.I

Ans: C

19 Which velocity is known as "If unequal displacements in equal intervals of time is moving"
A. instantaneous velocity
B. uniform velocity
C. non-uniform velocity
D. average velocity

Ans: B

19 What is mean by the ratio of total displacement to total time taken by the body?
A. non-uniform velocity
B. average velocity
C. instantaneous velocity
D. uniform velocity

Ans: B

21 The velocity of a body at a given instant is called as
A. instantaneous velocity
B. uniform velocity
C. non-uniform velocity
D. none of the above

Ans: A

1. When body is in motion, _____ always changes.

   A. its velocity   **B.** its acceleration

   C. its position vector   **D.** its momentum

   Answer & Explanation

   Answer: Option **C**

   Explanation:

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2. A body is moving with uniform velocity. Its

   A. speed changes   **B.** acceleration changes

   C. direction of motion changes   **D.** displacement from origin changes

   Answer & Explanation

   Answer: Option **D**

   Explanation:

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3. A man is in a car is moving with velocity of 36km/hr. His speed with repect to the car is

   A. 10m/s   **B.** 36m/s

   C. zero   **D.** infinite

   Answer & Explanation

   Answer: Option **C**

   Explanation:

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4. When velocity time graph is a straight line parallel to time axis then

   A. acceleration is const   **B.** acceleration is variable

   C. acceleration is zero   **D.** velocity is zero

   Answer & Explanation

   Answer: Option **C**

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5. Area under velocity time graph represent

   A. force

   B. displacement

   C. distance

   D. acceleration

   Answer & Explanation

   Answer: Option **C**

   Explanation:

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6. Slope of velocity time graph is

   A. acceleration

   B. distance

   C. force

   D. momentum

   Answer & Explanation

   Answer: Option **A**

   Explanation:

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7. Instantaneous and average velocities become equal when body

   A. has zero acceleration

   B. has uniform acceleration

   C. has variable acceleration

   D. moves in a circle

   Answer & Explanation

   Answer: Option **A**

   Explanation:

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8. Which law of motion is also called law of inertia?

   A. 1st law

   B. 2nd law

   C. 3rd law

   D. all 1st, 2nd and 3rd laws

   Answer & Explanation

Answer: Option **A**

Explanation:

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9. Inertia of an object is quantitative measure of its

A. volume

B. density

C. mass

D. temperature

Answer & Explanation

Answer: Option **C**

Explanation:

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10. Newtons laws do not hold good for particles

A. at rest

B. moving slowly

C. move with high velocity

D. move with velocity comparable to velocity of light

Answer & Explanation

Answer: Option **D**

Explanation:

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11. 1st law of motion gives the definition of

A. rest

B. motion

C. velocity

D. force

Answer & Explanation

Answer: Option **D**

Explanation:

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12. 2nd law of motion gives the definition of

A. force

B. acceleration

| C. | velocity | D. | both force and acceleration |

Answer & Explanation

Answer: Option **B**

Explanation:

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13. 3rd law of motion explains

| A. | effect of force | B. | existence of a force |
| C. | existence of two forces | D. | existence of pair of forces in nature |

Answer & Explanation

Answer: Option **D**

Explanation:

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14. Momentum depends upon

| A. | force acts on the body | B. | mass of the body |
| C. | velocity of the body | D. | both mass and velocity of the body |

Answer & Explanation

Answer: Option **D**

Explanation:

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15. The dimension of force is

| A. | MLT-2 | B. | ML2T-2 |
| C. | ML2T2 | D. | ML-2T-2 |

Answer & Explanation

Answer: Option **A**

Explanation:

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16. When a body moves in a straight line then its displacement coincides with

    A. distance   **B.** force

    C. acceleration is zero   **D.** both (a) and (b)

Answer & Explanation

Answer: Option **A**

Explanation:

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17. Which of the following pair has same direction always?

    A. force, displacement   **B.** force, velocity

    C. force, acceleration   **D.** force, momentum

Answer & Explanation

Answer: Option **C**

Explanation:

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18. Motorcycle safety helmet extends the time of collision hence decreasing the

    A. chance of collision   **B.** force acting

    C. velocity   **D.** impulse

Answer & Explanation

Answer: Option **D**

Explanation:

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19. The collision between two bodies be elastic if bodies are

    A. solid and soft   **B.** soft and elastic

    C. solid and hard   **D.** hard and elastic

Answer & Explanation

Answer: Option **C**

Explanation:

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20. During long jump, athlete runs before taking the jump. By doing so he

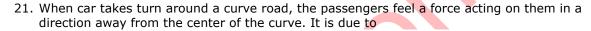   **A.** provide him a larger inertia   **B.** decreases his inertia

    C. decreases his momentum   **D.** increases his momentum

Answer & Explanation

Answer: Option **D**

Explanation:

21. When car takes turn around a curve road, the passengers feel a force acting on them in a direction away from the center of the curve. It is due to

    A. centripetal force   **B.** gravitational force

    C. their inertia   **D.** centrifugal force

Answer & Explanation

Answer: Option **C**

Explanation:

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22. A body is falling freely under gravity. How much distance it falls during an interval of time between 1st and 2nd seconds of its motion, taking g=10?

    A. 14 m   **B.** 20 m

    C. 5 m   **D.** 25 m

Answer & Explanation

Answer: Option **A**

Explanation:

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23. What is the shape of velocity, time graph for constant acceleration?

A.	straight inclined line.	B.	parabola
C.	inclined curve	D.	declined curve

Answer & Explanation

Answer: Option **A**

Explanation:

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24. When collision between the bodies in a system is inelastic in nature then for system

A.	momentum changes but K.E remain conserve	B.	K.E changes but momentum remain conserve
C.	both momentum and K.E changes	D.	both momentum and K.E remain conserve

Answer & Explanation

Answer: Option **B**

Explanation:

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25. Which shows the correct relation between time of flight T and maximum height H?

A.	H=gT2/8	B.	H=8T2/g
C.	H=8g/T2	D.	H=gT2

Answer & Explanation

Answer: Option **A**

Explanation:

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26. The acceleration in the rocket at any instant is proportional to the nth power of the velocity of the expelled gases. Where the value of n must be?

A.	-1	B.	1
C.	2	D.	-2

Answer & Explanation

Answer: Option **B**

Explanation:

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27. Taking off rocket can be explained by

A.	1st law of motion	**B.**	2nd law of motion
C.	Law of conservation of momentum	**D.**	law of conservation of energy

Answer & Explanation

Answer: Option **C**

Explanation:

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28. Which of the following is not an example of projectile motion.

A.	a gas filled ballon	**B.**	bullet fired from gun
C.	a football kicked	**D.**	a base ball shot

Answer & Explanation

Answer: Option **A**

Explanation:

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29. What is the angle of projection for which the range and maximum height become equal?

A.	tan-1 1/4	**B.**	tan-1 4
C.	tan-1 1/2	**D.**	tan-1 2

Answer & Explanation

Answer: Option **B**

Explanation:

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30. The thrust on the rocket in the absence of gravitational force of attraction is

A.	constant	**B.**	not constant

C. constant if the rate of ejected gases is constant

D. constant for short range rocket.

Answer & Explanation

Answer: Option **A**

Explanation:

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31. When two bodies move toward each other with constant speeds the distance between them decreases at the rate of 6m / sec. If they move in the same direction the distance between them increases at the rate of 4m/sec. Then their speeds are

A. 5m/s, 1m/s

B. 3m/s, 3m/s

C. 6m/s, 1m/s

D. 4m/s, 2m/s

Answer & Explanation

Answer: Option **A**

Explanation:

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32. Distance covered by a freely falling body in 2 seconds will be

A. 4.9 m

B. 19.6 m

C. 39.2 m

D. 44.1 m

Answer & Explanation

Answer: Option **B**

Explanation:

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33. The distance covered by a body in time t starting from rest is

A. at2/2

B. Vt

C. a2t/2

D. at2

Answer & Explanation

Answer: Option **A**

Explanation:

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34. Flight of a rocket in the space is an example of

    A.   second law of motion   **B.**   third law of motion

    C.   first law of motion   **D.**   law of gravitation

Answer & Explanation

Answer: Option **B**

Explanation:

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35. The trajectory (or path) of a projectile is

    A.   straight line   **B.**   parabola

    C.   hyperbola   **D.**   circle

Answer & Explanation

Answer: Option **B**

Explanation:

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36. At which angle the range of the projectile is maximum

    A.   45?   **B.**   60?

    C.   30?   **D.**   none

Answer & Explanation

Answer: Option **A**

Explanation:

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37. The force beared by a wall on which water strikes normally at a speed of 10m/sec and at a discharge of 0.0001m3/sec is.

    A.   1 N   **B.**   10 N

    C.   100 N   **D.**   none

Answer & Explanation

Answer: Option **A**

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38. Time rate of change of momentum is equal to

   A.   force

   B.   impulse

   C.   velocity

   D.   both (a) and (c)

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39. The range of the projectile at 30? and 60? are

   A.   equal to 45?

   B.   equal to 90?

   C.   equal to each other

   D.   none of the above

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40. Why Ballistic missile fails in some circumstances of precision.

   A.   due to their shape

   B.   due to air resistance

   C.   due to angle of projection

   D.   att of these