08 August 2024 Live Classes Schedule

| 8:00AM | 08 AUGUST 2024 DAILY CURRENT AFFAIRS | RUBY MA'AM |
| 9:00AM | 08 AUGUST 2024 DAILY DEFENCE UPDATES | DIVYANSHU SIR |

SSB INTERVIEW LIVE CLASSES

| 9:00AM | INTRODUCTION OF TAT & WAT | ANURADHA MA'AM |

AFCAT 2 2024 LIVE CLASSES

| 1:00PM | MAHA MARATHON SESSION - PART 4 | |

NDA 2 2024 LIVE CLASSES

11:00AM	GK - POLITY REVISION - CLASS 1	RUBY MA'AM
12:00PM	PHYSICS REVISION - CLASS 4	NAVJYOTI SIR
1:00PM	MATHS REVISION - CLASS 4	NAVJYOTI SIR
2:00PM	BIOLOGY REVISION - CLASS 4	SHIVANGI MA'AM
5:30PM	ENGLISH - MATCHING LIST - CLASS 1	ANURADHA MA'AM

CDS 2 2024 LIVE CLASSES

11:00AM	GK - POLITY REVISION - CLASS 1	RUBY MA'AM
12:00PM	PHYSICS REVISION - CLASS 4	NAVJYOTI SIR
2:00PM	BIOLOGY REVISION - CLASS 4	SHIVANGI MA'AM
3:00PM	MATHS REVISION - CLASS 4	NAVJYOTI SIR
5:30PM	ENGLISH - MATCHING LIST - CLASS 1	ANURADHA MA'AM

SSBCrack
EXAMS

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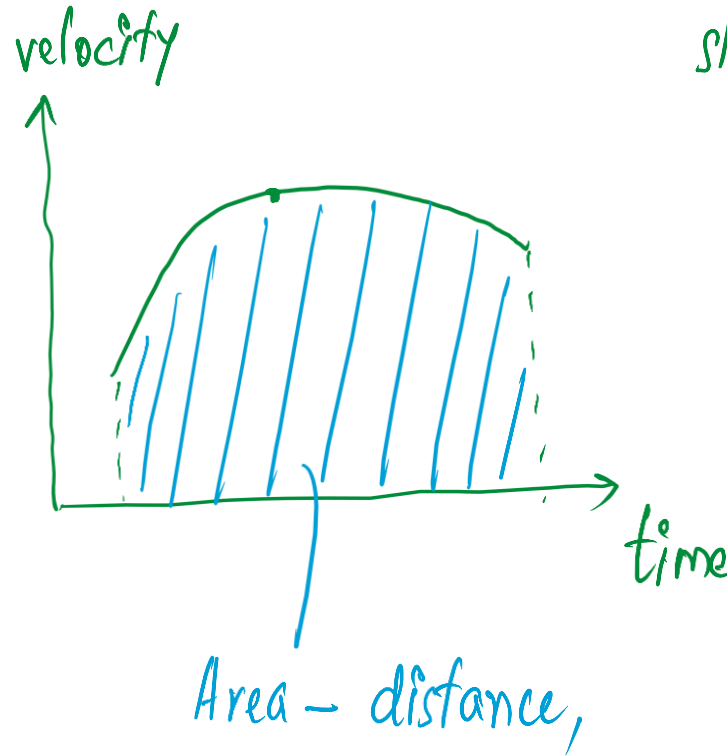
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REVISION TOPICS :

- **Motion**
- **Laws of Motion**

1. The Area Under Speed-time Graph Gives :

A. Acceleration

B. Velocity

C. Distance

D. None of the Above

velocity

time

Area – distance,

$slope = \dfrac{change\ in\ y\text{-coordinates}}{change\ in\ x\text{-coordinates}}$

$= \dfrac{change\ in\ velocity}{change\ in\ time}$

$= accleration,$

1. The Area Under Speed-time Graph Gives :

A. Acceleration

B. Velocity

C. **Distance**

D. None of the Above

2. If an object moves with constant velocity then which one of the following statements is NOT correct ?

(a) Its motion is along a straight line

(b) Its speed changes with time. ✓

(c) Its acceleration is zero

(d) Its displacement increases linearly with time

velocity $\equiv$ speed + direction
(constant)   (constant)

2. If an object moves with constant velocity then which one of the following statements is NOT correct?

(a) Its motion is along a straight line

(b) Its speed changes with time

(c) Its acceleration is zero
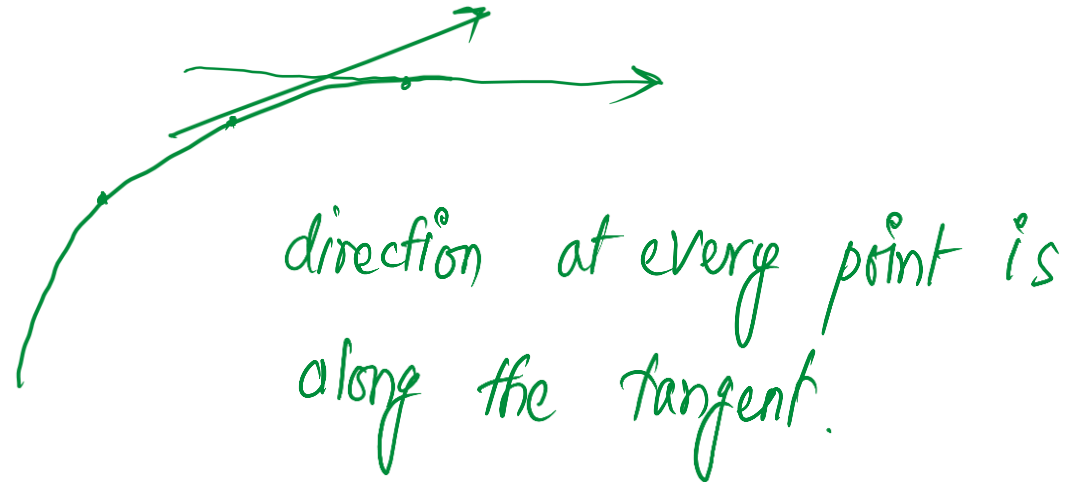
(d) Its displacement increases linearly with time

Answer: B

3. An object moves along a curved path. The following quantities may remain constant during its motion.

A. Speed

B. Velocity α

C. Magnitude of Acceleration

D. Both A and C

direction at every point is along the tangent.

3. An object moves along a curved path. The following quantities may remain constant during its motion.

A. Speed

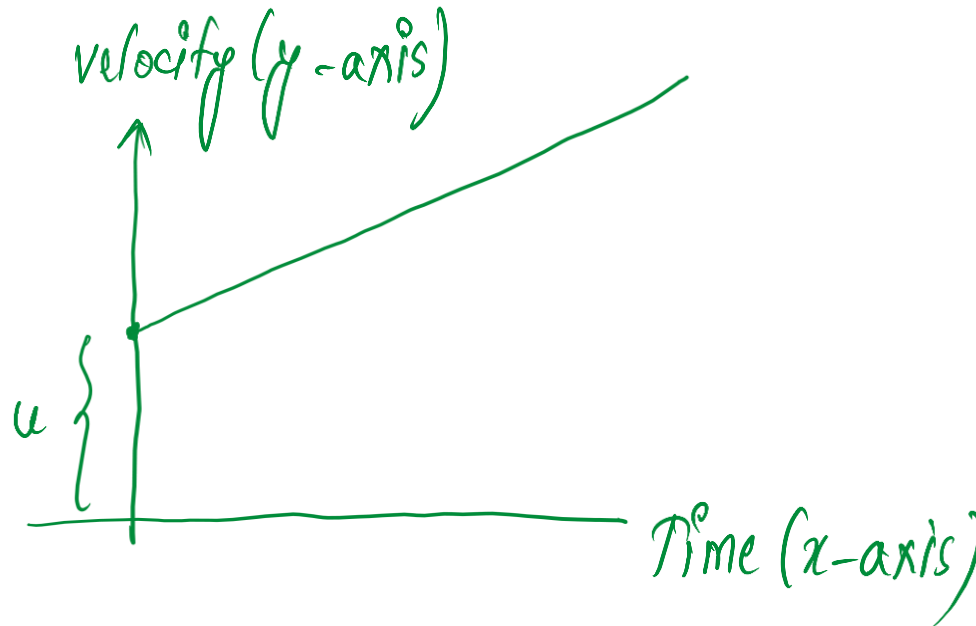B. Velocity

C. Magnitude of Acceleration

D. Both A and C

4. An object is moving with uniform acceleration a. Its initial velocity is u and after time t its velocity is v. The equation of its motion is $v = u + at$. The velocity (along y-axis) time (along x-axis) graph shall be a straight line

(a) passing through origin

(b) with x-intercept u

(c) with y-intercept u

(d) with slope u

4. An object is moving with uniform acceleration a. Its initial velocity is u and after time t its velocity is v. The equation of its motion is $v = u + at$. The velocity (along y-axis) time (along x-axis) graph shall be a straight line
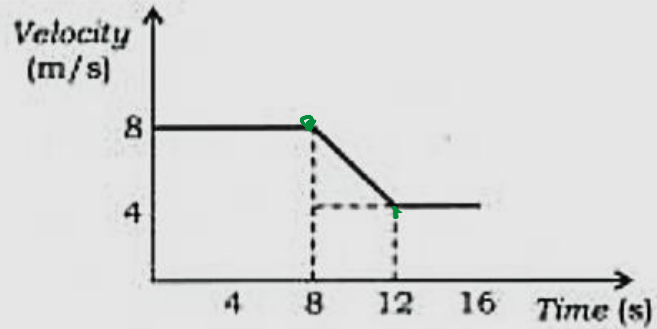
(a) passing through origin

(b) with x-intercept u

(c) with y-intercept u

(d) with slope u

Answer: C

Consider the following velocity and time graph :

5.

Which one of the following is the value of average acceleration from 8 s to 12 s?

(a) $8 \ m/s^2$

(b) $12 \ m/s^2$

(c) $2 \ m/s^2$

(d) $-1 \ m/s^2$

$$a = \frac{change \ in \ velocity}{Time \ taken \ in \ change} = \frac{final \ vel. - initial \ vel.}{Time}$$

$$a < 0,$$

$$a = \frac{4 - 8}{12 - 8} = \frac{-4}{4} = -1 \ m/s^2$$

5.

Consider the following velocity and time graph :

Which one of the following is the value of average acceleration from 8 s to 12 s?
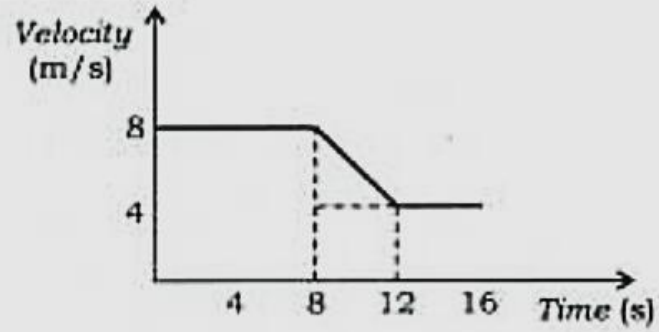
(a) 8 m/s^2

(b) 12 m/s^2

(c) 2 m/s^2

(d) -1 m/s^2

Answer: D

6. A car starts from Bengaluru, goes 50 km in a straight line towards south, immediately turns around and returns to Bengaluru. The time taken for this round trip is 2 hours. The magnitude of the average velocity of the car for this round trip

(a) is 0.

(b) is 50 km/hr.

(c) is 25 km/hr.

(d) cannot be calculated without knowing acceleration.

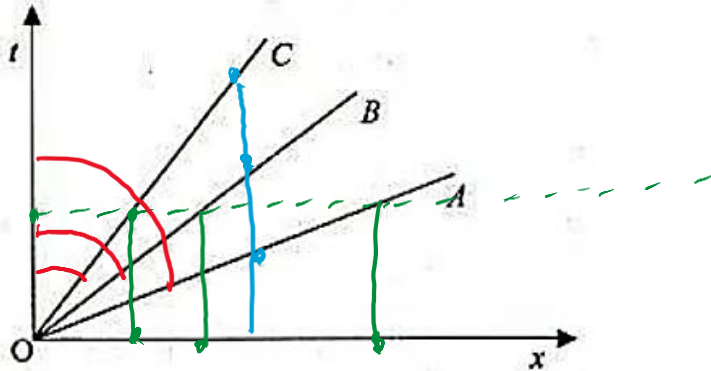**6.** A car starts from Bengaluru, goes 50 km in a straight line towards south, immediately turns around and returns to Bengaluru. The time taken for this round trip is 2 hours. The magnitude of the average velocity of the car for this round trip

(a)   is 0.

(b)   is 50 km/hr.

(c)   is 25 km/hr.

(d)   cannot be calculated without knowing acceleration.

Answer: A

7.

The figure shown above gives the time (*t*) versus position (*x*) graphs of three objects *A*, *B* and *C*. Which one of the following is the correct relation between their speeds V_A, V_B and V_C, respectively at any instant ($t > 0$)?

(a) $V_A < V_B < V_C$

(b) $V_A > V_B > V_C$

(c) $V_A = V_B = V_C \neq 0$

(d) $V_A = V_B = V_C = 0$
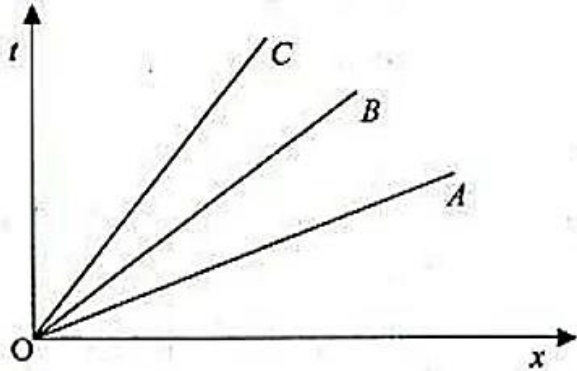
direct relation

$$\text{speed} = \frac{\text{distance} \checkmark}{\text{time}}$$

inverse.

$$V_A > V_B > V_C$$

{ (OR) θ – angle made by lines with time – axis
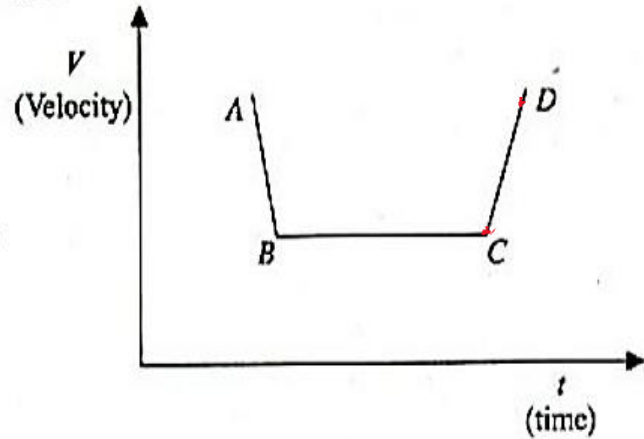greater θ —— greater speed }

7.

The figure shown above gives the time (*t*) versus position (*x*) graphs of three objects *A*, *B* and *C*. Which one of the following is the correct relation between their speeds V_A, V_B and V_C, respectively at any instant ($t > 0$)?

(a) $V_A < V_B < V_C$

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(c) $V_A = V_B = V_C \neq 0$

(d) $V_A = V_B = V_C = 0$

Answer: B

8.

In the given velocity (V) versus time (t) graph, accelerated and decelerated motions are respectively represented by line segments

(a) CD and BC

(b) BC and AB

(c) CD and AB

(d) AB and CD

reducing accleration / negative value of accleration,

increasing velocity (CD)

decreasing velocity (AB)

8.

In the given velocity (V) versus time (t) graph, accelerated and decelerated motions are respectively represented by line segments
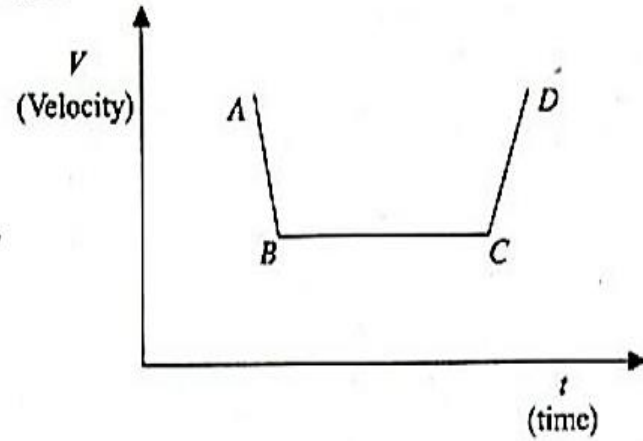
(a) CD and BC

(b) BC and AB

(c) CD and AB

(d) AB and CD

Answer: C

9. A tennis ball is thrown in the vertically upward direction and the ball attains a maximum height of 20 m. The ball was thrown approximately with an upward velocity of

(a) 8 m/s

(b) 12 m/s

(c) 16 m/s

(d) 20 m/s ✓

projectile

$$H = \frac{u^2 \sin^2\theta}{2g}$$

$$\theta = 90°, \quad H = \frac{u^2(1)}{2g}$$

$$20 = \frac{u^2}{2 \times 10}$$

$$u^2 = 20 \times 20 \implies u = 20 \ m/s$$

9. A tennis ball is thrown in the vertically upward direction and the ball attains a maximum height of 20 m. The ball was thrown approximately with an upward velocity of

(a) 8 m/s

(b) 12 m/s

(c) 16 m/s

(d) 20 m/s

Answer: D

10. A uniform motion of a car along a circular path experiences

(a) a change in speed due to a change in its direction of motion.

(b) a change in velocity due to a change in its direction of motion.

(c) a change in momentum due to no change in its direction of motion.

(d) a constant momentum due to a change in its direction of motion.

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(b) a change in velocity due to a change in its direction of motion.

(c) a change in momentum due to no change in its direction of motion.

(d) a constant momentum due to a change in its direction of motion.

Answer: B

11. Which one of the following statements about speed and velocity is correct?

(a) Speed and velocity both are vector quantities.

(b) Speed and velocity both are scalar quantities.

(c) Speed is vector quantity and velocity is scalar quantity.

(d) Speed is scalar quantity and velocity is vector quantity.

11. Which one of the following statements about speed and velocity is correct?

(a) Speed and velocity both are vector quantities.

(b) Speed and velocity both are scalar quantities.

(c) Speed is vector quantity and velocity is scalar quantity.

(d) Speed is scalar quantity and velocity is vector quantity.

Answer: D

12. What is the nature of velocity-time graph for a car moving with uniform acceleration?

(a) Parabola

(b) Logarithmic

(c) Straight line

(d) Exponential

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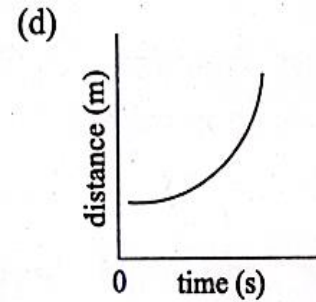**Answer: D**

13. Ram records the odometer readings of his car for the distance covered from 2000 km at the start of his journey and 2400 km at the end of the journey after 8 hours. What is the average speed of the car ?

(a) 50 km/h

(b) 60 km/h

(c) 70 km/h

(d) 80 km/h

**13.** Ram records the odometer readings of his car for the distance covered from 2000 km at the start of his journey and 2400 km at the end of the journey after 8 hours. What is the average speed of the car ?

(a) 50 km/h

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(c) 70 km/h

(d) 80 km/h

Answer: A

14. Which one of the following graphs represents the equation of motion $v = u + at$; where all quantities are non-zero and symbols carry their usual meanings ?

(a)

(c)

(b)

(d)
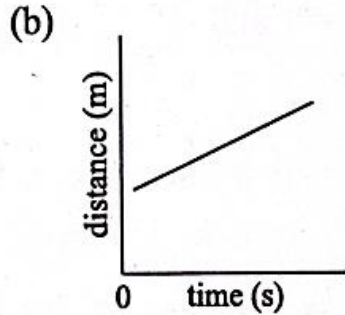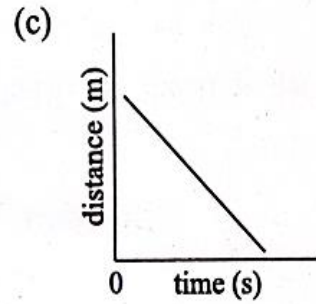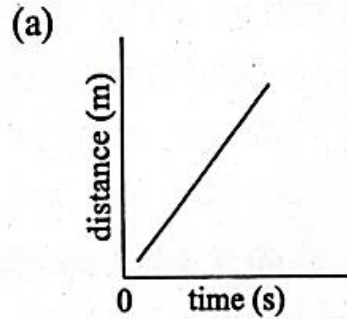
14. Which one of the following graphs represents the equation of motion $v = u + at$; where all quantities are non-zero and symbols carry their usual meanings?

Answer: D

(a)

(b)

(c)
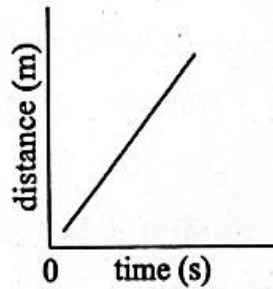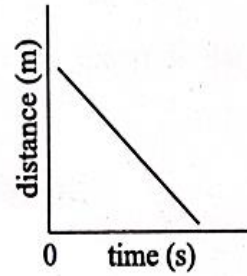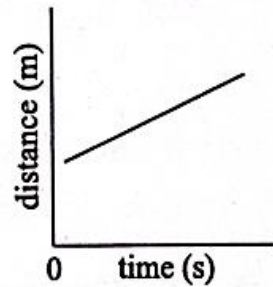
(d)

15. A stone is thrown horizontally from the top of a 20 m high building with a speed of 12 m/s. It hits the ground at a distance R from the building. Taking $g = 10$ m/s^2 and neglecting air resistance will give :

(a) $R = 12$ m

(b) $R = 18$ m

(c) $R = 24$ m

(d) $R = 30$ m

15. A stone is thrown horizontally from the top of a 20 m high building with a speed of 12 m/s. It hits the ground at a distance R from the building. Taking $g = 10$ m/s^2 and neglecting air resistance will give :

(a)   R = 12 m

(b)   R = 18 m

(c)   R = 24 m

(d)   R = 30 m

Answer: C

16. **A person travels distance πR along the circumference of a circle of radius R. Displacement of the person is**

A. R

B. 2R

C. 2πR

D. 0

16. A person travels distance πR along the circumference of a circle of radius R. Displacement of the person is

A. R

B. 2R

C. 2πR

D. 0

17. The distance – time graph of a body moving along a straight path in a single direction with uniform speed will be

A. Along X – Axis

B. A line with +ve slope

C. Parallel to X – Axis

D. None of these

17. The distance – time graph of a body moving along a straight path in a single direction with uniform speed will be

A. Along X – Axis

B. **A line with +ve slope**

C. Parallel to X – Axis

D. None of these

18. A particle is moving in a circle of radius R with a constant speed v. Its average acceleration over the time when it moves over half the circle is :

(a) $\dfrac{v^2}{R}$

(b) $\dfrac{\pi v^2}{2R}$

(c) $\dfrac{2v^2}{\pi R}$

(d) 0

18. A particle is moving in a circle of radius R with a constant speed v. Its average acceleration over the time when it moves over half the circle is :

   (a) $\dfrac{v^2}{R}$

   (b) $\dfrac{\pi v^2}{2R}$

   (c) $\dfrac{2v^2}{\pi R}$

   (d) 0

Answer: C

19. A motorcyclist drives from place A to B with a uniform speed of 30 km h^{-1} and returns from place B to A with a uniform speed of 20 kmh^{-1}. Find his average speed.

A. 12 kmh^{-1}

B. 6kmh^{-1}

C. 24 kmh^{-1}

D. 10 kmh^{-1}

19. A motorcyclist drives from place A to B with a uniform speed of 30 km h^{-1} and returns from place B to A with a uniform speed of 20 kmh^{-1}. Find his average speed.

A. 12 kmh^{-1}

B. 6kmh^{-1}

C. **24 kmh^{-1}**

D. 10 kmh^{-1}

20. John is travelling from home to his school. He travels a distance of 3 km towards East , then 4 km towards North and finally 9 km towards East. Is the distance and displacement equal in this case ?

A. Yes

B. No

C. Maybe

D. Can't say

20. John is travelling from home to his school. He travels a distance of 3 km towards East , then 4 km towards North and finally 9 km towards East. Is the distance and displacement equal in this case ?

A. Yes

B. No

C. Maybe

D. Can't say

21. Two forces of 5·0 N each are acting on a point mass. If the angle between the forces is 60°, then the net force acting on the point mass has magnitude close to :

(a)   8·6 N

(b)   4·3 N

(c)   5·0 N

(d)   6·7 N

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(d)   6·7 N

Answer: A

LAWS OF MOTION
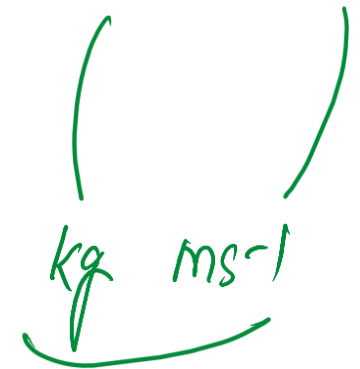
1. The SI Unit Of Momentum Is

A. $kgms^{-1}$

B. $kgms^{-2}$

C. $kgm^{-1}s^{-2}$

D. None of these

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A. kgms^{-1}

B. kgms^{-2}

C. kgm^{-1}s^{-2}

D. None of these

Momentum = mass × velocity

$$\Big(\quad\Big)$$

kg ms-1

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2. Car A Of Mass 1500 kg Travelling At 25 m/s Collides With Another Car B Of Mass 1000 kg Travelling At 15 m/s In The Same Direction. After Collision The Velocity of Car A Becomes 20 m/s. What Is The Velocity Of Car B After Collision ?

A. 25 m/s

B. 22.5 m/s

C. 36.7 m/s

D. 16.7 m/s

$$1500 \times 25 + 1000 \times 15 = 1500 \times 20 + 1000 \times v$$

$$\left(m_1 u_1 + m_2 u_2 = m_1 v_1 + m_2 v_2 \right)$$
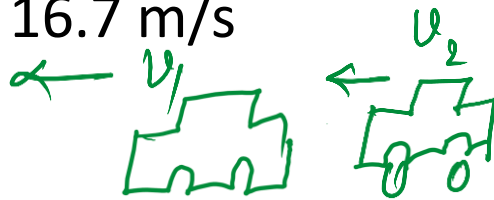
After collision

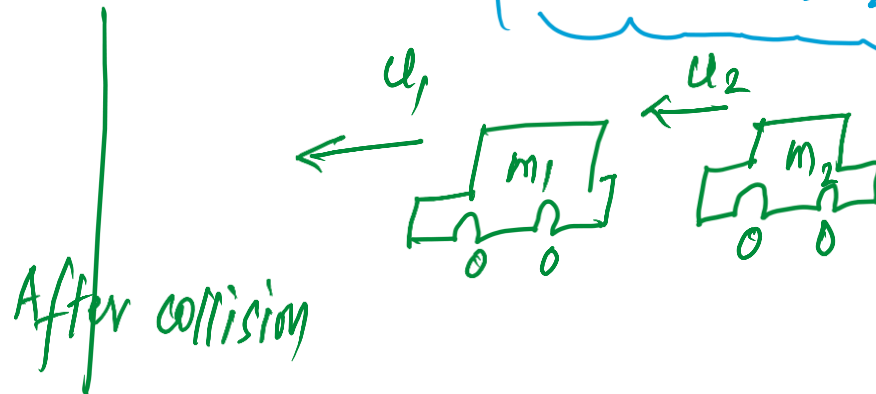**2. Car A Of Mass 1500 kg Travelling At 25 m/s Collides With Another Car B Of Mass 1000 kg Travelling At 15 m/s In The Same Direction. After Collision The Velocity of Car A Becomes 20 m/s. What Is The Velocity Of Car B After Collision ?**

A. 25 m/s

B. **22.5 m/s**

C. 36.7 m/s

D. 16.7 m/s

3. When A Body Is Stationary :

A. There Is No Force Acting On It

B. The Forces Acting On It Are Not In Contact With It

C. The Combination Of Forces Acting On It Balances Each Other

D. The Body Is In Vacuum

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A. There Is No Force Acting On It

B. The Forces Acting On It Are Not In Contact With It

C. **The Combination Of Forces Acting On It Balances Each Other**

D. The Body Is In Vacuum

4. A Cricket Player Catches A Ball Of Mass 10^{-1} kg Moving With A Velocity Of 25 ms^{-1}.

If The Ball Is Caught In 0.1 s , The Force Of The Blow Exerted On The Hand Of The

Player Is

A. 4 N

B. 25 N

C. 40 N

D. 250 N

$$\text{Impulse} = f \times t = \text{change in momentum} = \text{mass(change in velocity)}$$

$$f \times t = 0.1(0 - 25)$$

$$f = \frac{-2.5}{0.1} = -25 \ N$$

magnitude

(-ve due to direction)

force - is - opposite to motion of ball.

4. A Cricket Player Catches A Ball Of Mass 10^{-1} kg Moving With A Velocity Of 25 ms^{-1}. If The Ball Is Caught In 0.1 s , The Force Of The Blow Exerted On The Hand Of The Player Is

A. 4 N

B. 25 N

C. 40 N

D. 250 N

5. A Football And A Stone Has Same Mass,

A.   Both Have Same Inertia

B.   Both Have Same Momentum

C.   Both Have Different Inertia

D.   Both Have Different Momentum

5. A Football And A Stone Has Same Mass,

A. Both Have Same Inertia

B. Both Have Same Momentum

C. Both Have Different Inertia

D. Both Have Different Momentum

6. _____ is responsible for the change in magnitude of speed.

A. Momentum

B. Force

C. Speed

D. Kinetic Energy

6. _____ is responsible for the change in magnitude of speed.

A. Momentum

B.   Force

C. Speed

D. Kinetic Energy

7. Which one of the following has maximum inertia ?

(a) An atom

(b) A molecule

(c) A one-rupee coin

(d) A cricket ball
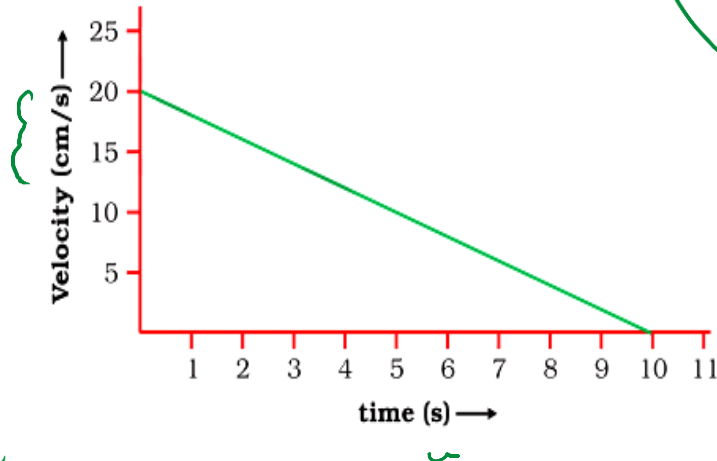
max. mass $\longrightarrow$ max. inertia

7. Which one of the following has maximum inertia ?

(a) An atom

(b) A molecule

(c) A one-rupee coin

(d) A cricket ball

Answer: D

8. The velocity-time graph of a ball of mass 20 g moving along a straight line on a long table is shown. How much force does the table exert on the ball to bring it to rest ?

A.   0.0002 N

B. - 0.0002 N

C.   0.004 N

D. - 0.0004 N

$$F = ma$$

$$= 0.02 \left(\frac{0 - 20 \text{ cm/s}}{10 - 0 \text{ s}} \right)$$

$$(kg)$$

$$= (0.02)(- 2 \text{ cm/s}^2)$$

$$= (0.02)(- 0.02 \text{ m/s}^2)$$

$$= - 0.0004 \text{ kgms}^{-2} / N$$

$$N - kgms^{-2}$$

Graph: Velocity (cm/s) on y-axis (5, 10, 15, 20, 25), time (s) on x-axis (1–11). Line from (0, 20) decreasing to about (10, 0).

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A.   0.0002 N

B.   - 0.0002 N

C.   0.004 N

D.   - 0.0004 N
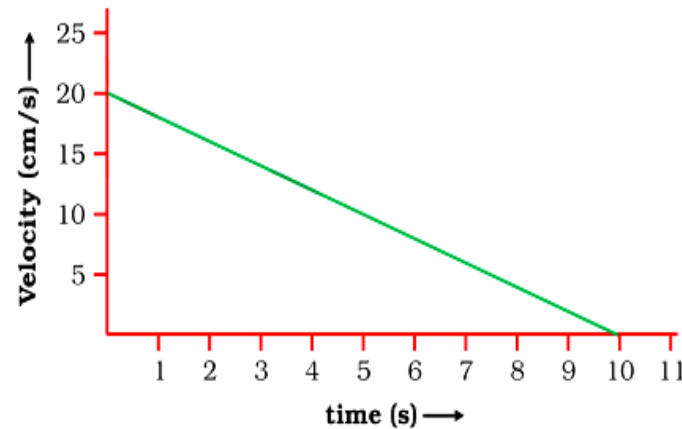
9. The statement "friction force is a contact force while magnetic force is a non-contact force" is

(a) always true.

(b) true only at 0°C.

(c) a false statement.

(d) either true or false depending upon the temperature of the surroundings.

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(a) always true.

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Answer: A

10. A bullet of mass 10 g is horizontally fired with velocity 300 m s^{-1} from a pistol of mass 1 kg. What is the recoil velocity of the pistol?

(a) 0·3 m s^{-1}

(b) 3 m s^{-1}

(c) −3 m s^{-1}

(d) −0·3 m s^{-1}

Initial momentum = Final momentum

$$0 + 0 = (0.01)(300) + 1(v)$$

$$v = -3 \ m/s$$

10. A bullet of mass 10 g is horizontally fired with velocity 300 m s^{-1} from a pistol of mass 1 kg. What is the recoil velocity of the pistol?

Answer: C

(a) 0·3 m s^{-1}

(b) 3 m s^{-1}

(c) −3 m s^{-1}

(d) −0·3 m s^{-1}

11. An Object Of Mass 2 kg Is Sliding With A Constant Velocity Of 4 m/s On A Frictionless Horizontal Table. The Force Required To Keep The Object Moving With The Same Velocity Is

A. 32 N

B. 0 N

C. 2 N

D. 8 N

11. An Object Of Mass 2 kg Is Sliding With A Constant Velocity Of 4 m/s On A Frictionless Horizontal Table. The Force Required To Keep The Object Moving With The Same Velocity Is

A. 32 N

B. 0 N

C. 2 N

D. 8 N

12. With reference to the third law of motion, Action and Reaction happens at _____.

A. Same Time

B. Different Time

C. Action happens first and then Reaction

D. Reaction happens first and then Action

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EXAMS

12. With reference to the third law of motion, Action and Reaction happens at _____.

A. Same Time

B.   Different Time

C.   Action happens first and then Reaction

D.   Reaction happens first and then Action

13. A boy of mass 52 kg jumps with a horizontal velocity of 2 m/s onto a stationary cart of mass 3 kg. The cart is fixed with frictionless wheels. Which one of the following would be the speed of the cart?

(a) 2·15 m/s

(b) 1·89 m/s

(c) 1·51 m/s

(d) 2·51 m/s

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(a) 2·15 m/s

(b) 1·89 m/s

(c) 1·51 m/s

(d) 2·51 m/s

Answer: B

14. Sand falls vertically on a conveyor belt at a rate of 0·1 kg/s. In order to keep the belt moving at a uniform speed of 2 m/s, the force required to be applied on the belt is :

(a) 0 N

(b) 0·2 N

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15. The motion of a particle of mass m is described by the relation, $y = ut - \frac{1}{2}gt^2$, where u is the initial velocity of the particle. The force acting on the particle is

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(b) $F = mg$

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Answer: D

16. A driver accelerates his car first at the rate of 4 m/s^2 and then at the rate of 8 m/s^2. Calculate the ratio of forces exerted by the engine.

A.   2 : 3

B.   3 : 4

C.   2 : 1

D.   1 : 2

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17. A Goalkeeper In A Game Of Football Pulls His Hands Backwards After Holding

The Ball Shot At Goal. This Enables The Goalkeeper To

A.   Exert Large Force On The Ball

B.   Increase The Force Exerted By The Ball On Hands

C.   Increase The Rate Of Change Of Momentum

D.   Decrease The Rate Of Change Of Momentum

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EXAMS

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18. Type of inertia that tends to Resist the change in case of an athlete often jumps before taking a long jump

A. Inertia of Rest

B. Inertia of Motion

C. Inertia of Direction

D. Uniformly Accelerated Motion

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19. A Sedan Car Of Mass 200 kg Is Moving With A Certain Velocity. It Is Brought To Rest By The Application Of Brakes , Within A Distance Of 20 m When The Average Resistance Being Offered To It Is 500 N. What Was The Velocity Of The Motor Car ?

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B. 30 m/s

C. 20 m/s

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20 . In the absence of External force , the velocity _____.

A. Remains constant

B. Vanishes

C. Changes continously

D. None of the Above

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REVISION TOPICS : (09/08/24)
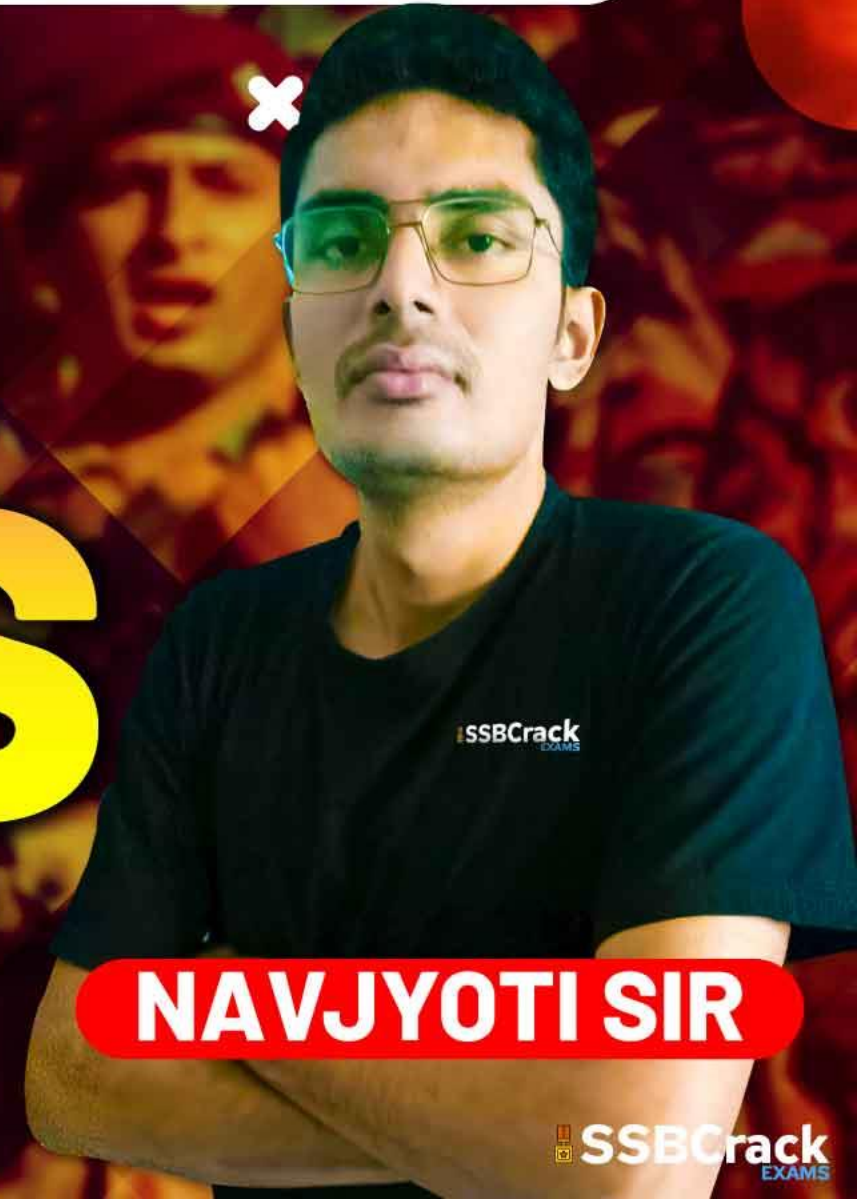
- **Work,Energy and Power**
- **Gravitation**