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# Practice Set 1

## Classical MECHANICS

**Topic :** Linear motion, velocity, acceleration, force, Newton's laws of motion, linear momentum and impulse of force.


**DDCET final exam weightage of this topic :** 3 Questions ( 6 Marks )

**Total Practice sets of this topic :**  $3 \text{ ( sets ) } \times 30 \text{ ( questions ) } = 90 \text{ Questions}$

**Total Practice tests of this topic :**  $3 \text{ ( exams ) } \times 25 \text{ ( questions ) } = 75 \text{ Questions}$

**Offline / Online during lecture :**  $4 \text{ ( lectures ) } \times 70 \text{ ( Questions ) } = 280 \text{ Question}$

Total 445 Questions to  
practice this topic

 **91739 04421**

## Section 1 :

### Linear motion, velocity, acceleration, force, Newton's laws of motion, linear momentum and impulse of force.

- 1 Which of the following is the SI unit of velocity?
  - A) Meter per second (m/s)
  - B) Kilometer per hour (km/h)
  - C) Newton (N)
  - D) Meter per second squared (m/s<sup>2</sup>)
- 2 According to Newton's first law of motion, an object at rest remains at rest unless acted upon by a:
  - A) Balanced force
  - B) Frictional force
  - C) Net external force
  - D) Centripetal force
- 3 The acceleration of an object is directly proportional to the:
  - A) Mass of the object
  - B) Velocity of the object
  - C) Net force acting on the object
  - D) Momentum of the object
- 4 Which of the following represents the correct formula for linear momentum?
  - A)  $p=mv$
  - B)  $p=ma$
  - C)  $p=Fd$
  - D)  $p=mv/F$
- 5 Impulse is equal to the:
  - A) Product of mass and acceleration
  - B) Rate of change of momentum
  - C) Change in momentum
  - D) Work done on the object
- 6 A body is moving with uniform velocity. What is the net force acting on it?
  - A) Equal to its weight
  - B) Greater than zero
  - C) Zero
  - D) Equal to its momentum

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# UNITY TRAINING ACADEMY FOR DDCET

## Section 1 :

### Linear motion, velocity, acceleration, force, Newton's laws of motion, linear momentum and impulse of force.

- 7 Which of the following is an example of Newton's third law of motion?
  - A) A ball rolling on the ground slows down due to friction
  - B) A rocket propelling forward due to the expulsion of gases
  - C) A car coming to a stop when brakes are applied
  - D) A ball falling freely under gravity
- 8 If the velocity of an object increases, what happens to its momentum?
  - A) Decreases
  - B) Increases
  - C) Remains constant
  - D) Becomes zero
- 9 Find the acceleration produced by applying a force of 30 N on an object of mass of 5 kg. [ DDCET 2024 ]
  - A)  $0.6 \text{ m/s}^2$
  - B)  $6 \text{ m/s}^2$
  - C)  $6 \text{ m/s}$
  - D)  $0.6 \text{ m/s}$
- 10 The rate of change of velocity is known as:
  - A) Speed
  - B) Acceleration
  - C) Momentum
  - D) Force
- 11 A force of 10 N is applied to a mass of 2 kg. What is its acceleration?
  - A)  $5 \text{ m/s}^2$
  - B)  $20 \text{ m/s}^2$
  - C)  $10 \text{ m/s}^2$
  - D)  $2 \text{ m/s}^2$
- 12 If no external force acts on a system, the total momentum of the system remains:
  - A) Constant
  - B) Zero
  - C) Increasing
  - D) Decreasing

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## Section 1 :

### Linear motion, velocity, acceleration, force, Newton's laws of motion, linear momentum and impulse of force.

- 13 A car moving with a velocity of 20 m/s comes to a stop in 5 seconds. What is its acceleration?
- A)  $-4 \text{ m/s}^2$   
B)  $4 \text{ m/s}^2$   
C)  $-10 \text{ m/s}^2$   
D)  $10 \text{ m/s}^2$
- 14 A force is said to be balanced when:
- A) It changes the state of motion of an object  
B) It causes acceleration  
C) The net force is zero  
D) It increases mass
- 15 The tendency of an object to resist a change in its motion is called:
- A) Acceleration  
B) Inertia  
C) Momentum  
D) Force
- 16 When a gun is fired, the bullet moves forward, and the gun moves backward. This is an example of:
- A) Newton's first law  
B) Newton's second law  
C) Newton's third law  
D) Law of inertia
- 17 What is the SI unit of force?
- A) Kilogram  
B) Newton  
C) Joule  
D) Watt
- 18 A car moves with a uniform velocity of 30 m/s. What is its acceleration?
- A)  $30 \text{ m/s}^2$   
B)  $10 \text{ m/s}^2$   
C)  $0 \text{ m/s}^2$   
D)  $-30 \text{ m/s}^2$

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## Section 1 :

### Linear motion, velocity, acceleration, force, Newton's laws of motion, linear momentum and impulse of force.

- 19 The impulse experienced by an object is equal to:
- A) The work done on the object
  - B) The change in the object's kinetic energy
  - C) The change in momentum of the object
  - D) The weight of the object
- 20 The force required to stop a moving object depends on:
- A) The mass of the object
  - B) The velocity of the object
  - C) Both mass and velocity
  - D) The shape of the object
- 21 If a force is applied to an object and there is no motion, what kind of force is it?
- A) Balanced force
  - B) Unbalanced force
  - C) Centripetal force
  - D) Impulsive force
- 22 What happens to acceleration if force is doubled and mass remains constant?
- A) It doubles
  - B) It halves
  - C) It remains the same
  - D) It becomes zero
- 23 What does Newton's first law of motion define?
- A) Force
  - B) Inertia
  - C) Momentum
  - D) Acceleration
- 24 A ball dropped from a height falls freely under the influence of:
- A) Friction
  - B) Gravity
  - C) Air resistance
  - D) Magnetic force

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# UNITY TRAINING ACADEMY FOR DDCET

## Section 1 :

### Linear motion, velocity, acceleration, force, Newton's laws of motion, linear momentum and impulse of force.

- 25 What happens to the momentum of a system when two objects collide and stick together?
- A) It remains the same
  - B) It increases
  - C) It decreases
  - D) It becomes zero
- 26 What does the slope of a velocity-time graph represent?
- A) Speed
  - B) Acceleration
  - C) Displacement
  - D) Momentum
- 27 Which of the following affects the inertia of an object?
- A) Its volume
  - B) Its velocity
  - C) Its mass
  - D) Its temperature
- 28 An object is thrown vertically upwards. At the highest point, its velocity is:
- A) Maximum
  - B) Zero
  - C) Negative
  - D) Equal to acceleration
- 29 A car and a truck have the same momentum. Which one has greater velocity?
- A) Car
  - B) Truck
  - C) Both have equal velocity
  - D) Cannot be determined
- 30 What force keeps a satellite moving in a circular orbit around Earth?
- A) Friction
  - B) Gravitational force
  - C) Magnetic force
  - D) Electrical force

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