UNIT-2

MULTIPLE CHOICE QUESTIONS

BOOK- MCQs

1. Newton's First law of motion is also known as law of
   a) speed b) rest
   c) inertia d) force
2. Quantity of matter contained in body is called_____.
   a) mass b) volume
   c) area d) weight
3. Quantity of motion contained in a body is called
   a) force b) inertia
   c) momentum d) gravity
4. Law of conservation of momentum defines that the total momentum of a system of two bodies before and after collision_____.
   a) remains constant b) retains more momentum
   c) losses some momentum d) None of above is true
5. Weight of a body can be measured using a spring balance, it differs from place to place because of variation in _____.
   a) acceleration **b) gravitational pull**
   c) velocity d) size of spring balance
6. It is easier to push an empty shopping cart than a full one, because the filled cart has more mass than the empty one. This can be expressed by
   a) $F > m$ b) $F < m$
   c) $F \alpha 1/m$ **d) $F \alpha m$**
7. Centrifugal force is always directed
   a) towards centre **b) away from centre**
   c) along the circular path d) all sides
8. Friction opposes motion between two bodies in contact because of
   a) charges on bodies b) weight of bodies
   c) roughness of surfaces d) None of above
9. Which statement is true for limiting frictional force.
   a) it is greater than rolling friction
   b) it is greater that sliding friction
   c) it is greater that kinetic friction
   d) all are true
10. A man pulls a crate of mass 25 kg across leveled ground with a horizontal force of 60 N. A constant force of friction of 20 N acts on the sledge. What is the acceleration of the sledge?
    a) 0.63 ms^{-2} **b) 1.6 ms^{-2}**
    c) 2.4 ms^{-2} d) 3.2 ms^{-2}

UNIT-2

EXAM PRACTICE MULTIPLE CHOICE QUESTIONS

1. The SI unit of momentum is:

A. kg m/s

B. N/m

C. kg m/s^2

D. J

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2 Momentum is a:

A. scalar quantity

B. vector quantity

C. constant quantity only

D. unitless quantity

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3. If velocity is doubled while mass remains constant, momentum:

A. becomes half

B. doubles

C. becomes zero

D. remains the same

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4. A 5 kg object at rest has momentum:

A. 0 kg m/s

B. 5 kg m/s

C. 10 kg m/s

D. 25 kg m/s

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5. The law of conservation of momentum applies when:

A. external force is zero

B. internal force is zero

C. velocity is zero

D. mass is zero

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6. **A 2 kg object moves with a velocity of 5 m/s. What is its momentum?**
A. 2.5 kg m/s
B. 7 kg m/s
C. 10 kg m/s
D. 25 kg m/s

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7. **A 4 kg ball has momentum 20 kg m/s. What is its velocity?**
A. 4 m/s
B. 5 m/s
C. 10 m/s
D. 20 m/s

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8. **A car of mass 1000 kg moves at 10 m/s. Find its momentum.**
A. 100 kg m/s
B. 1000 kg m/s
C. 10,000 kg m/s
D. 100,000 kg m/s

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9. **An object has momentum 30 kg m/s and velocity 6 m/s. What is its mass?**
A. 3 kg
B. 5 kg
C. 6 kg
D. 10 kg

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10. **The law of conservation of momentum states that total momentum remains constant if:**
A. external force is zero
B. internal force is zero
C. mass is zero
D. velocity is zero

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11. **In a closed system, total momentum before collision is:**
A. greater than after collision
B. less than after collision
C. equal to total momentum after collision
D. always zero

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12. **Momentum is conserved in:**
A. explosions only
B. collisions only
C. both collisions and explosions
D. neither collisions nor explosions

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13. **If two objects collide and no external force acts, total momentum:**
A. increases
B. decreases
C. remains constant
D. becomes zero

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14. **A 2 kg ball moving at 3 m/s collides with a 1 kg ball at rest. If the 2 kg ball stops after collision, what is the velocity of the 1 kg ball?**
A. 3 m/s
B. 4 m/s
C. 6 m/s
D. 9 m/s

Hint
Initial momentum = 2 × 3 + 1 × 0 = 6 kg m/s
Final momentum = 0 + 1 × v = v
So, v = **6 m/s**

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15. **A 5 kg object moving at 4 m/s collides with a 3 kg object at rest. They stick together. What is their common velocity?**
A. 1.5 m/s
B. 2.5 m/s
C. 4 m/s
D. 8 m/s

Hint
Initial momentum = 5 × 4 = 20 kg m/s
Total mass = 5 + 3 = 8 kg
Velocity = 20/8 = **2.5 m/s**

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16. A 10 kg body moving at 2 m/s collides with a 5 kg body moving in the same direction at 1 m/s. They stick together. Find their final velocity.

A. 1 m/s
B. 1.5 m/s
C. 1.67 m/s
D. 2 m/s

Hint
Initial momentum = (10 × 2) + (5 × 1) = 25 kg m/s
Total mass = 15 kg
Velocity = 25/15 = **1.67 m/s**

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17. A 4 kg object moving at 6 m/s hits a 2 kg object at rest. After collision, the 4 kg object moves at 3 m/s. Find the velocity of the 2 kg object.

A. 3 m/s
B. 6 m/s
C. 9 m/s
D. 12 m/s

Hint
Initial momentum = 4 × 6 = 24 kg m/s
Final momentum = (4 × 3) + (2 × v)
24 = 12 + 2v
v = **6 m/s**

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18. A gun of mass 5 kg fires a bullet of mass 0.05 kg at 100 m/s. What is the recoil velocity of the gun?

A. 0.5 m/s backward
B. 1 m/s backward
C. 2 m/s backward
D. 5 m/s backward

Hint
Initial momentum = 0
Final momentum = bullet momentum + gun momentum
0 = (0.05 × 100) + (5 × v)
0 = 5 + 5v
v = -1 m/s

19. Newton's First Law of Motion is also called the law of:

A. acceleration
B. inertia
C. action and reaction
D. momentum

20. According to Newton's First Law, an object at rest will remain at rest unless:
A. its mass changes
B. an external force acts on it
C. its speed becomes zero
D. gravity stops acting

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21. Newton's Second Law of Motion gives the relationship between:
A. force, mass, and acceleration
B. force, distance, and work
C. mass, velocity, and momentum
D. energy, power, and time

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22. If the force on an object increases while mass remains constant, acceleration:
A. decreases
B. increases
C. becomes zero
D. remains same

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23. Which is an example of Newton's Third Law?
A. A ball falling towards the Earth
B. A rocket moving upward by pushing gases downward
C. A ball slowing down due to friction
D. A car stopping at a red light

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24. A passenger moves forward when a moving bus suddenly stops. This is due to:
A. acceleration
B. inertia of motion
C. reaction force
D. gravity

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25. What force is needed to accelerate a 4 kg object at 3 m/s^2?
A. 7 N
B. 12 N
C. 1.33 N
D. 16 N