# PHYSICS NMDCAT

## PMC TOPIC WISE TEST (UNIT-1)

**TOPICS:**

✓ **Force and Motion**

**Q. 1 A duck flies 60 meters in 10 seconds. What is the duck's speed?**

A. 6 m/s
B. 50 m/s
C. 600 m/s
D. 70 m/s

**Q. 2 A beetle crawls 2 cm/minute for ten minutes. How far did it crawl?**

A. 8 centimeters
B. 20 centimeters
C. 5 centimeters
D. 0.20 centimeters

**Q. 3 The slope of v-t graph for uniform velocity is**

A. 0
B. Negative
C. Positive
D. Positive or negative

**Q. 4 What unit do scientists use to measure force?**

A. grams
B. meter per second per second
C. meters
D. newton

**Q. 5 What is the net force on the box shown below?**


A. 10 N to the right
B. 10 N to the left
C. 60 N to the left
D. 50 N to the right

**Q. 6 When projectile is projected in XY-plane makes an angle θ with x-axis then $v_y$**

A. Remains same
B. Goes on decreasing with height
C. Goes on increasing with height
D. First increases then decreases

**Q. 7 A stone is released from moving train the stone will follow**

A. Hyperbolic path
B. Straight path
C. Parabolic path
D. Circular path

**Q. 8 A person can throw a stone to maximum distance of 80m the greatest height to which he can throw the stone is**

A. 100 m
B. 50 m
C. 80 m
D. 20 m

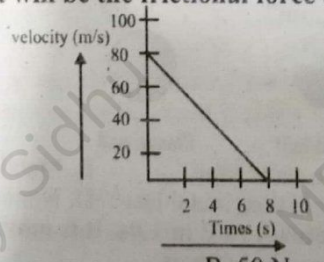
**Q. 9 At the top of trajectory in projectile motion angle between v and acceleration is**

A. 90°
B. 60°
C. 0°
D. 180°

**Q. 10 When a body is stationary**

A. There is no force acting
B. Net force is zero
C. Body is in vacuum
D. Force is less than weight

**Q. 11 Velocity versus time graph of a ball of mass 50 g rolling on a concrete floor is shown in the figure below. What will be the frictional force of the floor on the ball?**




A. 500 N
B. 50 N
C. 0.5 N
D. 0.05 N

**Q. 12 Force bear by wall on which water strike normally at speed of 10 m $sec^{-1}$ and at a discharge .0001 $m^3$/sec is**

A. 1 N
B. 100 N
C. 10 N
D. 1000 N

**Q. 13 A car accelerates from 4·0 $ms^{-1}$ to 20 $ms^{-1}$ in 5·0 s. Calculate the acceleration of the car**

A. 0.5 $ms^{-2}$
B. 3.2 $ms^{-2}$
C. 4.0 $ms^{-2}$
D. 4.8 $ms^{-2}$

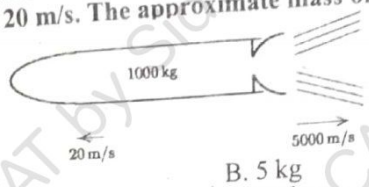
**Q. 14 When a ball is thrown straight up with no air resistance, the acceleration at its highest point**

A. Is upward
B. Is zero
C. Reverses from upward to downward
D. Is downward

**Q. 15 K.E of projectile at highest point is half of its initial K.E angle of projection is**

A. 30°
B. 45°
C. 60°
D. None

**Q. 16 A 1000-kg space probe is motionless in space. To start moving, its main engine is fired for 5 s during which time it ejects exhaust gases at 5000 m/s. At the end of this process it is moving at 20 m/s. The approximate mass of the ejected gas is:**




A. 0.8 kg
B. 5 kg
C. 4 kg
D. 20 kg

**Q. 17 When you walk across the ground and push on it with your feet**

A. There is no effect on the ground
B. The ground pushes back less strongly than your feet
C. The ground pushes back on your feet with equal force
D. The ground pushes back more strongly than your feet

**Q. 18 The displacement time graph for two bodies A and B are straight these inclined at 60° and 30° to time axis. Find ratio of their speed is**

A. 3 : 1
B. $\sqrt{3}:1$
C. 1 : 3
D. $1:\sqrt{3}$

**Q. 19 The speed of a car weighing 1500 kg increases from 36 km/h to 72 km/h uniformly. What will be the change in momentum of the car?**

A. 15000 kg km/h
B. 15000 kg m/s
C. 54000 kg m/s
D. 54000 g m/s

**Q. 20 A force of 10 N acts on a body for 5 sec. What will be the change in momentum?**

A. 10 N s
B. 50 N s
C. 5 N s
D. 100 N s

**Q. 21 A person walks along a straight road for the first half time with velocity $v_1$ and second half time with velocity $v_2$. Then mean velocity v is given by**

A. $\frac{v_1+v_2}{2}$
B. $\frac{2v_1v_2}{v_1+v_2}$
C. $\frac{\vec{v_1}+\left(-\vec{v_2}\right)}{4}$
D. $\sqrt{v_1v_2}$

**Q. 22 Which ball will hit the ground first if dropped at the same time and at the same height in a perfect vacuum?**

wood ball Plastic ball metal ball

A. They will all hit at the same time
B. Metal first, then plastic, then wood last
C. Wood first, then plastic, then metal last
D. None of these

**Q. 23 A particle goes from point A to B in 1.0s. It is moving in a semicircle of radius 1.0m. The magnitude of average velocity is**

A. 3.14 m/s
B. 1.9 m/s
C. 2.0 m/s
D. Zero

**Q. 24 At the highest point, the velocity of projectile is**

A. Maximum
B. Minimum
C. Zero
D. Equal to half of x–component of velocity

**Q. 25 The quantity of motion that the body possesses due to its mass and velocity is known as**

A. Moment of force
B. Force
C. Impulse
D. Momentum

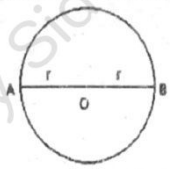
**Q. 26 Newton's 2nd law of motion establishes relationship between:**

A. Force and acceleration
B. Mass and force
C. Mass and velocity
D. Acceleration and mass

**Q. 27 Newton's third law of motion explains the two forces namely 'action' and 'reaction' coming into action when the two bodies are in contact with each other. These two forces:**

A. Always act on the different bodies in opposite directions
B. Have same magnitude and direction
C. Always act on the same body
D. Acts on either body at normal to each other

**Q. 28 The displacement after half a circle would be**




A. $\pi r$
B. Zero
C. 2r
D. non-uniform motion

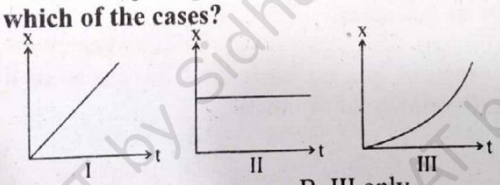
**Q. 29 If $R = \frac{R_{max}}{2}$ then angle of projection is**

A. 30°
B. 60°
C. 15°
D. None

**Q. 30 A 70 g ball collides with another ball of mass 140 g. The initial velocity of the first ball is 9 $ms^{-1}$ to the right while the second ball is at rest. If the collision were perfectly elastic; what would be the velocity of the two balls in $ms^{-1}$ after the collision?**

A. –3, 6
B. 6, –3
C. 3, 7
D. –7, 3

**Q. 31 Three objects can only move along a straight, level path. The graphs below show the position x of each of the objects plotted as a function of time t. The net force on the object is zero in which of the cases?**




A. II only
B. III only
C. I and III only
D. I and II only

**Q. 32 In a free fall the velocity of a stone is increasing equally in equal intervals of time under the effect of gravitational force of the earth. Then what can you say about the motion of this stone? Whether the stone is having:**

A. Non-uniform acceleration
B. Uniform acceleration
C. Retardation
D. Constant speed

**Q. 33 A body of mass M collides against a wall with a velocity v and retraces its path with the same speed. The change in momentum is (take the initial direction of the velocity as positive)**

A. 2Mv
B. –2Mv
C. Mv
D. Zero

**Q. 34 In elastic collision, 100% energy transfer takes place when**

A. $m_1 > m_2$
B. $m_1 = m_2$
C. $m_1 < m_2$
D. $m_1 = 2m_2$

**Q. 35 If two equal masse ($m_1 = m_2$) collide elastically in one dimension, where $m_2$ is at rest and $m_1$ moving with velocity $u_1$, then final velocities of the two masses are**

A. $v_1 = v_2 = 0$
B. $v_1 = 0$ ; $v_2 = u_1$
C. $v_1 = -u_1$ ; $v_2 = 0$
D. $v_1 = 0$ ; $v_2 = -u_1$

**Q. 36 A freight train rolls along a track with considerable momentum. If it rolls at the same speed but has twice as much mass, its momentum is**

A. Zero
B. Twice
C. Unchanged
D. Four times as much

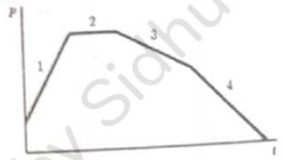
**Q. 37 The impulse-momentum relationship is a direct result of**

A. Newton's 1st law
B. Newton's 3rd law.
C. Newton's law of gravity
D. Newton's 2nd law.

**Q. 38 A heavy truck has more momentum than a passenger car moving at the same speed because the truck**

A. Has greater speed
B. Is not streamlined.
C. Has a large wheelbase
D. Has greater mass

**Q. 39 A particle moves along the x axis. Its momentum is graphed below as a function of time. Rank the numbered regions according to the magnitude of the force acting on the particle, least to greatest.**




A. 1, 2, 3, 4
B. 1, 4, 3, 2
C. 1, 3, 4, 2
D. 2, 3, 4, 1

**Q. 40 A 2.5-kg stone is released from rest and falls toward Earth. After 4.0 s, the magnitude of its momentum is:**

A. 39 kg m/s
B. 78 kg m/s
C. zero
D. 98 kg m/s

**Q. 41 A rifle of mass M is initially at rest but free to recoil. It fires a bullet of mass m and velocity v (relative to the ground). After firing, the velocity of the rifle (relative to the ground) is:**

A. −Mv/m
B. −mv
C. mv/M
D. −mv/M

**Q. 42 What is the path of a projectile?**

A. A hyperbola
B. A parabola
C. A wavy line
D. Projectiles do not follow a predictable path

**Q. 43 An object is accelerating**

A. Only when its speed changes
B. When its speed or direction changes
C. Only when its direction changes
D. If its velocity is large.

**Q. 44 The maximum range of gun on horizontal terrain is 16 km. If g = 10 m/s². What must be the muzzle velocity of the shell?**

A. 100 m/s
B. 400 m/s
C. 200 m/s
D. 50 m/s

**Q. 45 At the height 80 m, an aeroplane is moving with 150 m/s. A bomb is dropped from it so as to hit a target. At what distance from the target should the bomb be dropped**

A. 650 m
B. 600 m
C. 230 m
D. 80 m

**Q. 46 A ball is projected with velocity 10 m/sec at angle of 30°with the horizontal surface. The time taken by ball to reach the ground is**

A. 1 sec
B. 2sec
C. 20 m/sec
D.8m/sec

**Q. 47 Two particles are projected with same velocity but at angles of projection (45 - θ) and (45 + θ). Then their horizontal ranges are in the ratio of**

A. 1 : 2
B. 1:1
C. 4 : 1
D. 2 : 1

**Q. 48 A body is thrown with the velocity (4i + 3j) m/s. Its maximum height is (g=10m/s²)**

A. 2.5m
B. 0.45m
C. 0.9m
D. 0.8m

**Q. 49 If a tennis ball moving with velocity 15 ms⁻¹ collides elastically with a wall, then velocity of tennis ball after collision will be_____**

A. 15 ms⁻¹
B. 30 ms⁻¹
C. −15 ms⁻¹
D. −30 ms⁻¹

**Q. 50 The acceleration of a projectile relative to another projectile is**

A. g
B. 0
C. −g
D. 2g

| | A | B | C | D | | A | B | C | D | | A | B | C | D | | A | B | C | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | ● | | | | 16 | | | ● | | 31 | | | | ● | 46 | ● | | | |
| 2 | | ● | | | 17 | | | ● | | 32 | | ● | | | 47 | | ● | | |
| 3 | ● | | | | 18 | ● | | | | 33 | | ● | | | 48 | Grace | | | |
| 4 | | | | ● | 19 | | ● | | | 34 | | ● | | | 49 | | | ● | |
| 5 | | ● | | | 20 | | ● | | | 35 | | ● | | | 50 | | | ● | |
| 6 | | ● | | | 21 | ● | | | | 36 | | ● | | | 51 | | | | |
| 7 | | | ● | | 22 | ● | | | | 37 | | | | ● | 52 | | | | |
| 8 | | | | ● | 23 | | | ● | | 38 | | | | ● | 53 | | | | |
| 9 | ● | | | | 24 | | ● | | | 39 | | | | ● | 54 | | | | |
| 10 | | ● | | | 25 | | | | ● | 40 | | | | ● | 55 | | | | |
| 11 | | | ● | | 26 | ● | | | | 41 | | ● | | | 56 | | | | |
| 12 | ● | | | | 27 | ● | | | | 42 | | ● | | | 57 | | | | |
| 13 | | ● | | | 28 | | | ● | | 43 | | ● | | | 58 | | | | |
| 14 | | | | ● | 29 | | | ● | | 44 | | ● | | | 59 | | | | |
| 15 | | ● | | | 30 | ● | | | | 45 | | ● | | | 60 | | | | |

Roll No.

1. Use Blue Ball Point Pen Only.
2. Please Fill In The Roll No. Correctly.
3. It Is Important That The Circle Is Filled Completely And Correctly As Shown In The Example Below, Otherwise

Correct Example: ○ ● ○ ○ ✓

Incorrect Examples: ○ ● ● ○ ✗ ○ ○ ● ○ ✗ ○ ○ ○ ◉ ✗

CTS-1

CHAPTER/TEST# Physics DATE: 3 August

NAME: [redacted]

ROLL NO. (IN WORDS): 12

CLASS/SESSION:

CANDIDATE'S SIGNATURE:

48 MCQ → Grace Mark