

Convent School

(2026 – 27)

Set - A

Unit Test 1
Class 10
Physics**Time: 45 Min.**

Name: _____

Roll no: _____

MM: 20

General Instructions:

1. This Question paper contains - four sections A, B, C, and D. Each section is compulsory.
2. Section A has 4 MCQs based questions of 0.5 mark each.
3. Section B has 2 Very Short Answer (VSA)-type questions of 1 mark each.
4. Section C has 5 Short Answer (SA)-type questions of 2 marks each.
5. Section D has 2 Long Answer (LA)-type questions of 3 marks each.
6. Write neatly and clearly in the space provided.
7. Do not cut or fill the circle given on upper and bottom of paper.

Section A: 4 MCQs based questions of 0.5 mark each.Write down the correct answer from the given options for each of the following questions:

Q1. The turning effect of a force about a point is called:

0.5 / 0.5

- a) Work b) Power c) Moment d) Energy

ANS: ☒ C ✓

Q2. The SI unit of power is:

0.5 / 0.5

- a) Joule b) Watt c) Newton d) Erg

ANS: ☒ B ✓

Q3. In uniform circular motion, the force acting towards the center is called:

0.0 / 0.5

- a) Centrifugal force b) Centripetal force c) Gravitational force d) Magnetic force

ANS: ☐ A ✗

Q4. A spring is compressed, storing potential energy. When the spring is released, it propels an object forward. What change would you notice in the total mechanical energy of the system?

- (a) It increases (b) It decreases (c) It becomes zero (d) It remains constant

0.0 / 0.5

ANS: ☐ B ✗Page total: **1.0** von **2.0**

Section B : 2 Very Short Answer (VSA)-type questions of 1 mark each.

Q5. Differentiate between uniform linear motion and uniform circular motion.

9.5

Circular motion missing: speed constant; specify direction changes continuously also.

Answer: uniform linear motion is defined as moving with a constant speed in a straight path. uniform circular motion is defined as moving in a circular path with change in velocity.

Q6. State the Principle of Conservation of Energy.

1.0 /1

Answer: Acco. to the principle of conservation of Energy, Energy can neither be created nor be destroyed. Energy can not be lost, but it can change.

Section C: 5 Short Answer (SA)-type questions of 2 marks each

Q7. State the conditions for a body to be in equilibrium.

1.0 /2

First condition unclear and incorrectly written; moment condition not stated.

Answer: (i) the sum of Moments of force will be zero.
(ii) the resultant force will be zero.

Q8. Write two differences between centripetal force and centrifugal force.

2.0 /2

Answer: <u>Centrifugal force</u>	<u>Centripetal force.</u>
<u>(i) A force assumed in the direction away from the center of centrifugal path, the force acting</u>	<u>(i) A force in the body moving in a circular path, the force acting</u>
<u>(ii) It is not real.</u>	<u>towards the center.</u>
	<u>(ii) It is real.</u>

Q9. A boy of mass 40 kg climbs a staircase of height 5 m in 20 seconds. Calculate the work done and power developed. (Take $g = 9.8 \text{ m/s}^2$). /2

Answer *Given*

$m = 40 \text{ kg}, g = 9.8 \text{ m/s}^2$
 $h = 5 \text{ m}$
 $t = 20 \text{ s}$ force = mg
 $= 40 \times 9.8$
 $= 392 \text{ N}$

work = $F \times S$
 $= 392 \times 5$
 $= 1960 \text{ J}$

power = $\frac{\text{work}}{\text{time}} = \frac{1960}{20}$

Marks	2.0
Feedback	

Q10. A ball of mass 0.20 kg is thrown vertically upwards with an initial velocity of 20 m/s.
Calculate the maximum potential energy it gains as it goes up. /2

Answer: $m = 0.20 \text{ kg}$
 $u = 20 \text{ m/s}; A.T.O$
potential energy will be
zero when it goes up.
Bcz = potential energy is

Marks	0.5
Feedback	{Use energy conservation: maximum potential energy equals kinetic energy. $PE_{\text{max}} = \frac{1}{2} m u^2 = 40 \text{ J}$; 'PE zero' wrong.}

Q11. When a body moves in a circular path, how much work is done by the body? Give reason. /2

Reason incorrect: displacement is not zero; force perpendicular to displacement. 1.0

Answer: When a body moves in a circular path, the work done will be zero. bcz work depend on the displacement and force, as displacement is zero so, work done will also be zero.

Section D: 2 Long Answer (LA)-type questions of 3 marks each.

Q12. A piece of stone tied at the end of a thread is whirled in a horizontal circle with uniform speed by hand.

1.25

/3

Answer the following questions:

(a) Is the velocity of stone uniform or variable?

Answer: velocity of stone will be variable. ✓

(b) Is the acceleration of stone uniform or variable?

Answer: the acceleration of stone will be variable. ✓

(c) What is the direction of acceleration of stone at any instant?

Answer: Direction of an acceleration of stone will be circular. Acceleration points toward the centre, not along the circular path.

(d) Which force provides the centripetal force required for circular motion?

Answer: Centrifugal force. incorrect: centrifugal force is wrong; tension provides centripetal inward force.

(e) Name the force and its direction which acts on the hand.

Answer: Rotational motion in circular direction acts on hand. the force will be centrifugal. Force named correctly but direction outward not given answer incomplete.

(f) What happens if the thread suddenly breaks? Give reason for your answer.

Answer: Centrifugal force will be applied Bcz will go away from the centre of circular path. Motion is tangential due to inertia; centrifugal force is incorrect.

Q13. A body of mass m falls through a height h . Obtain an expression for the work done by the force of gravity.

/3

Answer: Given Mass = m
height = h

We know,

$$\text{Work done} = F \times \text{Displacement} \\ = m \times a \times h$$

$$\text{Work done} = m \cdot g \cdot h$$

Work store in the form of
potential energy = $M \times g \times h$ stored

$\therefore$ When a body falls from a height
its acceleration convert into
gravity.

Marks	2.0
Feedback	Attempt good. Use $F=mg$. Work equals mgh ; potential energy decreases by mgh , not 'acceleration converts into gravity' during a fall.

12.25/20.0

Usha Rani 11:41, 27.07.2026