



ST. JOSEPH'S COLLEGE, PRAYAGRAJ

FIRST UNIT TEST 2025-26

PHYSICS

CLASS – X

TIME: 1 Hour

MM: 30

SECTION – A [18 Marks]

(Attempt all questions)

Q 1) Choose the correct answer from the options given below:

[6]

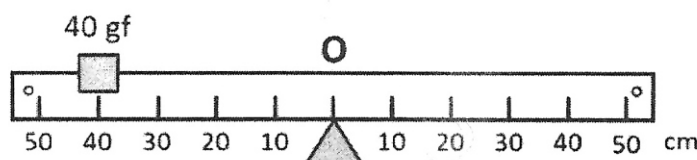
- (i) 10^7 dyne cm is equal to _____ Nm.
 (a) 1 (b) 10 (c) 100 (d) 1000
- (ii) The direction of motion in circular motion:
 (a) is linear (b) is along the tangent at that point of the circular path
 (c) towards the centre (d) none of these
- (iii) kWh is the unit of:
 (a) Power (b) Force (c) Energy (d) None of these
- (iv) **Assertion:** The centre of gravity of an irregularly shaped object always lies at its geometric centre.
Reason: The centre of gravity depends on the distribution of mass within an object.
 (a) Assertion is false but Reason is true.
 (b) Assertion is true but Reason is false.
 (c) Both Assertion and Reason are true.
 (d) Both Assertion and Reason are false.
- (v) According to work energy theorem, the increase in the kinetic energy of a moving body is equal to _____ by a force acting in the direction of the moving body.
 (a) displacement (b) velocity (c) acceleration (d) work done
- (vi) In a photoelectric cell, the change in energy is from:
 (a) electrical to mechanical (b) light energy to electrical energy
 (c) electrical energy to light energy (d) chemical energy to light energy

Q 2) (i) What do you understand by the term couple? State its effect on a body.

[2]

(ii) The diagram below shows a uniform bar supported at the middle point O. A weight of 40 gf is placed at a distance 40 cm to the left of point O. How can you balance the bar with a weight of 80 gf?

[2]



(iii) What is the position of the centre of gravity of a:

- (a) hollow sphere, and (b) solid cone

[2]

(iv) State two differences between centripetal and centrifugal force.

[2]

(v) A boy weighing 350 N climbs up 30 steps, each 20 cm high in 1 minute. Calculate :

[2]

- (a) the work done, and (b) the power spent.

(vi) Calculate the kinetic energy of a body of mass 0.1 kg and momentum 20 kg ms⁻¹.

[2]

SECTION – B [12 Marks]

Q 3) (i) (a) A light mass and a heavy mass have equal momentum. Which will have more kinetic energy?

[1]

(b) A satellite revolves around the earth in a circular orbit. What is the work done by the satellite? Give reason.

[2]

(ii) A uniform half metre rule can be balanced at the 29.0 cm mark when a mass 20 g is hung from its one end.

(a) Draw a diagram of the arrangement.

[1]

(b) Find the mass of the half metre rule.

[2]

(iii) (a) Complete the following sentence:

The moon revolving around the earth is in _____ equilibrium.

[1]

(b) A body is acted upon by two forces each of magnitude F , but in opposite directions. State the effect of the forces if

(i) both forces act at the same point of the body.

[1]

(ii) the two forces act at two different points of the body at a separation r .

[1]

(iv) (a) The stone of a hand flour grinder is provided with a handle near its rim. Give reason.

[1]

(b) State the condition when the work done by a force is (i) positive, (ii) negative

[2]