FIRST TERM EXAMINATION 2025-2026
STANDARD – X
SUBJECT - PHYSICS

TIME: 2 HRS. **M.M:80**

1. Answers to this Paper must be written on the paper provided separately.
2. You will not be allowed to write during first 15 minutes.
3. This time is to be spent in reading the question paper.
4. The time given at the head of this Paper is the time allowed for writing the answers.

Section A is compulsory. Attempt any four questions from Section B.

The intended marks for questions or parts of questions are given in brackets [ ].

SECTION-A (40 MARKS)

(Attempt all questions from this Section)

Question 1.

Choose the correct answers to the questions from the given options. **[15]**

(Do not copy the questions, write the correct answer only).

I) **The moment of a force about a given axis depends:**

a) only on the magnitude of force

b) only on the perpendicular distance of force from the axis

c) neither on the force nor on the perpendicular distance of force from the axis

d) on both the force and its perpendicular distance from the axis.

II) **Which of the following quantity remains constant in a uniform circular motion :**

a) velocity.
b) speed
c) acceleration.
d) both velocity and speed.

III) **A man standing near the building construction with a heavy tool box in his hand the work done by the man is:**

a) Maximum
b) Zero
c) Minimum
d) all of the above.

IV) Clockwise moment produced by a force about fulcrum is considered to be:

a) Positive.
b) Negative
c) Zero.
d) None of these

V) **When the speed of a moving object is doubled, then its kinetic energy.**

a) remains the same.
b) decreases
c) is doubled.
d) becomes four times

VI) **Class II levers are designed to have:**

a) M.A. = V.R.
b) M.A. > V.R
c) M.A. > 1.
d) M.A. < 1

VII) **Assertion (A): When a force retards the motion of a body, the work done by the body is zero.**

Reason (R): Work done depends on the angle between force and displacement.

a) Both A and R are true.
b) Both A and R are false.
c) A is false but R is true.
d) A is true but R is false.

VIII) The principle of working of a physical balance is

a) equality of moments.
b) long arm of balance
c) equality of forces.
d) equal weights in the pans

IX) Rain droplets drizzling with uniform speed are under

a) static equilibrium.
b) dynamic equillbrium
c) rotational equilibrium.
d) None of these

X) The CG of a body depends on

a) mass of the body
b) shape of the body
c) material of the body
d) height above the Earth

XI) A ball of mass m is thrown vertically up with an initial velocity so as to reach a height h. The correct statement is:

a) Potential energy of the ball at the ground is mgh.
b) Kinetic energy of the ball at the ground is zero.
c) Kinetic energy of the ball at the highest point is mgh.
d) Potential energy of the ball at the highest point is mgh.

XII) A body has kinetic energy 160 J. If the mass of the body is 5 kg, then choose its momentum from the following options.

a) $40\ kg\ ms^{-1}$
b) $60\ kg\ ms^{-1}$
c) $80\ kg\ ms^{-1}$
d) $20\ kg\ ms^{-1}$

XIII) What is the amount of force required to be applied on a body so as to displace it through 20m performing 8000J of work?

a) 400J
b) 40J
c) 400N
d) 40N

XIV) A movable pulley is used as :

a) a force multiplier. b) a speed multiplier

c) a device to change the direction of effort. d) an energy multiplier

XV) The moment of force changes with

a) axis of rotation. b) the magnitude of the force

c) Point of application of force d) all of these

Question: 2.

Complete the following sentences by choosing the correct option from the bracket: (6x1=6)

a) In case of a practical machine work input is _____(less/more) than work output.

b) A weight lifter and a coolie raises a load of 500N to a height of 6m in 10 min 20 min respectively. The ratio of power spent by weight lifter to power spent by coolie is _____(5:2/2:5/2:1)

c) Force necessary to produce uniform circular motion is _____(centripetal/centrifugal) force.

d) On reducing the speed of motorcycle the motorcyclist tends to come towards the centre of the circular path due to _____(centripetal/centrifugal) force.

e) An example of a simple machine that brings about transformation of energy is_____(sugarcane juice extractor/lever/pulley)

f) Rain droplets drizzling with uniform speed are under_____(static equilibrium/dynamic equilibrium).

ii) Give the units of Mechanical Advantage. (2)

iii) A force of 50N produces a moment of 10Nm in a rigid body. Calculate the perpendicular distance between the point of application of force and the turning point. (2)

Question: 3 **[15]**

I) Define kilowatt hour. How is it related to joule? **[2]**

ii) Which class of lever will always have MA> 1 and Why? **[2]**

iii) What is the velocity ratio of single moveable pulley? How does the friction in the pulley bearing affect it **[2]**

iv) Define power. State how it is related to horse power. **[2]**

v) Define Mechanical advantage. Write its SI unit. **[2]**

vi) A satellite revolves around a planet in a circular orbit. **[2]**

a) What is the work done by the satellite at any instant?

b) Give reason for your answer

vii) A uniform meter scale can be balanced at the *70.5 cm* mark when a mass of 0.05 kg is hung from the *94 cm mark.* ***[3]***

a) Draw a diagram of the arrangement.

b) Find the mass of the meter scale.

SECTION B (40 MARKS)

(Attempt any four questions)

Question 4

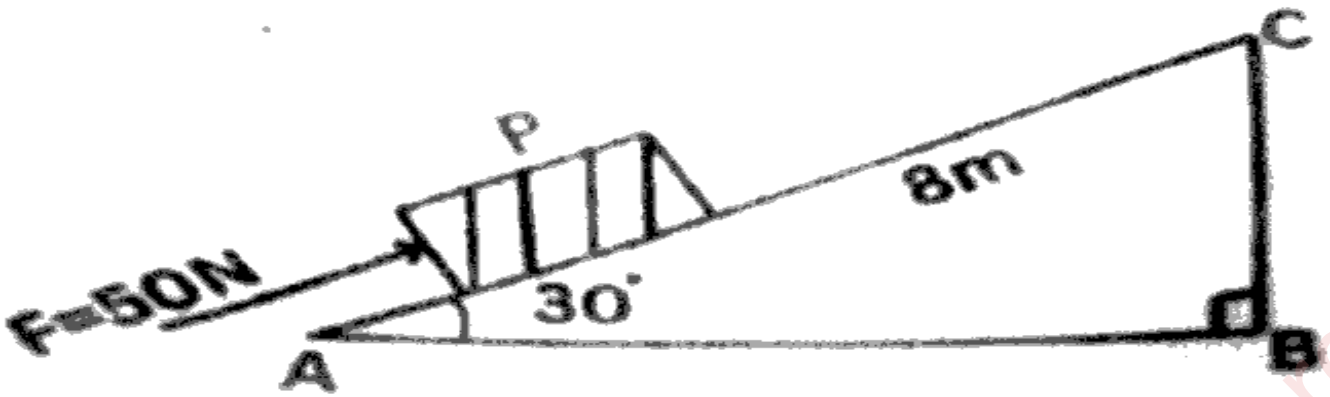
i) A meter rod is half made of copper and half made of iron if the mass of copper part is 900 gram and the mass of iron is 800 gram then calculate the position at which the rod can remain in equilibrium **(3)**

ii) Draw a block and tackle system of pulleys with velocity ratio equal to 3 **(3)**

iii) If a body of mass M is moving with velocity v then drive and expression for its kinetic energy **(4)**

Question 5

i) The mass of block P is 5 kg it is to be moved along and inclined plane AC of length 8 m which makes an angle of 30 degree with the horizontal a force of 50 Newton is applied on the block to move it through the inclined plane AC shown in the figure **(4)**



a) What is the work done by the force F along the inclined plane?

b) Find the gain in potential energy of block P if it is directly lifted to C from the ground

c) Why is the work done on the block and increase in potential energy of the block is different

ii) A person having a box on his head climbs up a slope and another man having an identical box walks the same distance on a level road who does more work against the force of gravity and why? **(3)**

iii) A nut which can be broken by applying a force of 40 kgf is broken by using a nutcracker having its handle 20 cm long by placing it at a distance 2 cm from the hinge. Calculate the minimum force needed to break the nut **(3)**

QUESTION 6

i) Draw diagram to illustrate the positions of fulcrum, load and effort in each of the following is **(3)**

a) A seesaw

b) A nutcracker

c) A forceps

ii) A simple pendulum while oscillating rises to maximum vertical height of 7 cm from its rest position when it reaches its extreme position on one side the mass of bob of simple pendulum is 400 gram and g = 10m/s2.

What is the total energy of the simple pendulum at any instant while it is oscillated **(3)**

ii) The given image a boy uses bow and arrow to hit a target **(4)**

a) What energy changes takes place in pulling the Bow string back
b) What energy changes takes place on releasing the arrow from bow
c) Which law is explaining this energy changes
d) State that law

QUESTION 7

i) State the energy changes in the following cases while in use: (3)

a) An electric iron. b) A ceiling fan.
c) Loudspeaker

ii) Define moment of force. State two factors affecting moment of force **(3)**

iii) A pulley system comprises two pulleys, one fixed and the other movable. **(4)**

a) Draw labelled diagram of the arrangement and show clearly the directions of all the forces acting on it.
b) Give two advantage of this combination

QUESTION 8

i) Two bodies A and B have masses in the ratio 5:1 and their kinetic energies in the ratio 125:9. Find the ratio of their velocities. **(3)**

ii) Give three examples where one form of mechanical energy changes to other form of mechanical energy. **(3)**

iii) Draw a block and tackle system having VR=4. **(4)**

QUESTION 9

i) Drive the relationship between mechanical advantage velocity ratio and efficiency **(3)**

ii) A spanner has a long handle why? **(3)**

iii) A roller with a diameter of 0.2 meter is raised over a pavement buy applying forces F1 and F2 as shown in the figure if the magnitude of both the forces is 20 Newton then compare the magnitude of torque produced by two forces **(4)**