

MOTITHANG MIDDLE SECONDARY SCHOOL

THIMPHU THROMDE

MID-TERM EXAMINATION, 2017

Physics

Writing Time: 2 Hours

Class X

Total Marks: 100

READ THE FOLLOWING DIRECTIONS CAREFULLY:

1. Do not write during the first fifteen minutes. This time is to be spent on reading the questions. After having read the questions, you will be given two hours to answer questions.
2. In this paper, there are two sections: A and B. Section A is compulsory. You are expected to attempt any five questions from Section B.
3. The intended marks for questions or parts of questions, are given in brackets [].
4. Read the directions to each question carefully and write all your answers in the answer sheet provided separately.

Section A (50 Marks)

*Compulsory: Attempt **all** questions.*

Question 1

- a) For each question, there are four alternatives: A, B, C and D. Choose the correct alternative and circle it. Do not circle more than ONE alternative. If there are more than one choice circled, NO score will be awarded.

[1 × 25 = 25]

- i) The point through the which the whole weight of the body acts is called
- A) gravitational field.
 - B) centre of gravity.
 - C) weight.
 - D) stability of the body.
- ii) Pressure due to solid increases with decrease in
- A) pressure.
 - B) area of contact.
 - C) magnitude of force.
 - D) thrust.

- iii) 1 Joule is equal to
A) 10^4 erg .
B) 10^5 erg .
C) 10^6 erg .
D) 10^7 erg .
- iv) The unit to measure power is
A) Joule.
B) Newton.
C) Kilometer.
D) Watt.
- v) Two bodies of different masses kept at a same height possesses
A) same K.E.
B) different K.E.
C) same P.E.
D) different P.E.
- vi) Potential difference is also called
A) voltage.
B) resistance.
C) workdone.
D) current.
- vii) What is the direction of the resultant force for the following figure?



- A) Along the direction of the force 7N.
B) Along the direction of the force 3N.
C) No moment.
D) Along both directions.
- viii) Hydraulic brake system works on the principle of
A) hydraulic machine.
B) force.
C) Pascal's law.
D) C. G.

- ix) Electrons flow from _____ to _____ concentration of electrons.
A) high, low
B) low, high
C) high, high
D) low, low
- x) Force of gravity depends on mass and
A) density of the mass.
B) volume of the mass.
C) distance between the masses.
D) C.G of the mass.
- xi) Current increases linearly with the increase in voltage in case of
A) insulators.
B) ohmic conductors.
C) Non-Ohmic conductors.
D) diodes.
- xii) When the displacement is normal to the direction of force, the work done is equal to
A) 0
B) 1
C) 2
D) 3
- xiii) is  a symbol to represent
A) resistor.
B) thermistor.
C) LDR.
D) filament lamp.
- xiv) A rice cooker draws 5 A when a voltage of 220 V is applied to it. What is the resistance of the rice cooker?
A) 44 Ω
B) 44 V
C) 44 J
D) 44 W

- xv) Work done against gravity is equal to
A) Kinetic Energy.
B) Potential Energy.
C) Sound Energy.
D) Heat Energy.
- xvi) Energy derived from the core of the earth's crust is called
A) geothermal energy.
B) solar energy.
C) wind energy
D) bioenergy.
- xvii) Pema and Karma throws a ball of 0.5 kg with a velocity of 10m/s and 15 m/s respectively. K.E acquired by the ball thrown by Karma is _____ times greater than the one thrown by Pema.
A) 4
B) 31.25
C) 2.25
D) 3
- xviii) Velocity of a falling object when the weight of the body equals drag force is called
A) terminal velocity.
B) terminal voltage.
C) acceleration.
D) displacement.
- xix) One of the environmental impacts of large scale solar power installations is
A) it effects migration of fishes.
B) it reduces number of transmission lines.
C) it produces noise.
D) it leads to destruction of ecosystem and habitats of native plants and animals.
- xx) A force of 5 N was applied to bring about a moment of force of 30 Nm. At what distance from the pivot the force was applied?
A) 5 m
B) 6 m
C) 7 m
D) 8 m

- xxi) Wool, cotton, straw and cellulose are used as _____ material.
- conduction
 - insulating
 - building
 - lighting
- xxii) A book of mass 1500 g, raised to a height of 0.5 m possesses P.E of
- 7.5 J
 - 7.5 W
 - 750 W
 - 7500 J
- xxiii) Resistance of a conductor is directly proportional to
- mass of the conductor.
 - volume of the conductor.
 - length of the conductor.
 - shape of the conductor.
- xxiv) To push a rock of 65 kg to a distance of 2 m, Sonam has to overcome a force of friction of 10 N. What is the work done against force of friction?
- 30 J
 - 40 J
 - 20 J
 - 10 J
- xxv) Work done against resistive force is dissipated in the form of
- sound energy and heat energy.
 - kinetic energy and potential energy.
 - mechanical energy.
 - wind energy.

- b) Match each item under Column A with the most appropriate item in Column B.
Rewrite the correct matching pairs in the answer sheet provided.

[5]

Column A	Column B
1. Buoyant Force	a. Open circuit
2. Cone on its base	b. Noise pollution
3. Solar energy	c. ρgV
4. emf	d. Close circuit

5. Wind energy	e. Stable equilibrium
	f. Photovoltaic
	g. hdg
	h. Unstable equilibrium

c) Fill in the blanks by writing suitable word(s). [5]

- Stability of a body depends on C.G and _____ of a body.
- Apparent weight is less than original weight due to _____.
- If a block of wood applies a force of 30 N on an area of 7.5 m^2 , then the pressure exerted by the block is _____.
- Efficiency of machines will be equal to 1 if work input is _____ to work output.
- Voltage drop is due to the presence of _____.

d) State whether the following statements are 'True' or 'False' and correct the false statements. [5]

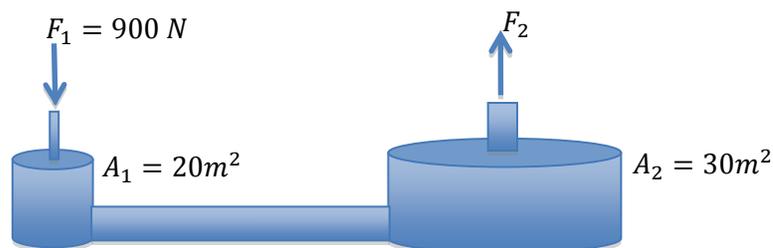
- The Centre of gravity of a body is always within the body.
- When a body is completely immersed in a liquid, up thrust is equal to weight of liquid displaced.
- Work is said to be done if an applied force do not produce a displacement.
- Coulomb is a unit to measure charge.
- A device to obstruct or regulate the flow of electric current is called a cell.

e) Answer the following questions.

i. Define equilibrant and find the value of the equilibrant for the given figure.[2]



ii. A hydraulic lift is shown in the figure. Refer the figure to calculate [2]



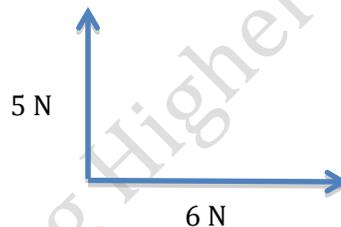
- a) pressure at A_1 .
 - b) force F_2 .
- iii. A boy pulls a cupboard of mass 55 kg to a distance of 80 cm in 5 seconds with an application of force of 150 N. [2]
- a) What is the work done by the boy?
 - b) Power developed by the boy?
- iv. Dorji lifts a load of 70 N using a pulley of efficiency 70%. How much of force must Dorji apply to lift the load to a height of 2.5 m? [2]
- v. State Ohm's law and use it to derive relationship between R, V and I. [2]

SECTION B (50 Marks)

Attempt any *five* questions.

Question 2

- a) For the following diagram, find the magnitude and direction of the resultant force. [3]



- b) State Pascal's law. [1]
- c) What happens to the equipment if the drop in voltage is too high? [2]
- d) Define electric current and mention the unit to measure it. [2]
- e) Define Mechanical energy. Mention two types of mechanical energy. [2]

Question 3

- a) Define couple and state two examples of couple. [2]
- b) What are the factors that determine the magnitude of fluid pressure? Explain each one of them. [6]
- c) What does a motor cycle weigh if each tire covers an area of 3cm^2 and each tire exerts a pressure of 25 kg/cm^2 on the ground? [2]

Question 4

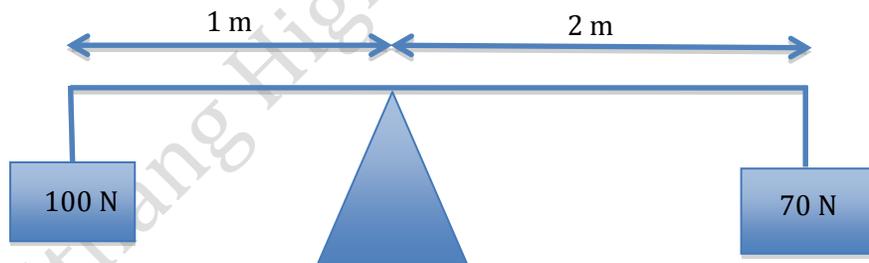
- a) State law of conservation of energy and explain the law with the help of an example. [3]
- b) A metal block of volume $1.5 \times 10^{-4} m^3$ and density of $7.874 \times 10^3 kg m^{-3}$ is completely immersed in water of density $1000 kg m^{-3}$. Calculate [3]
- Buoyant force experienced by the metal block.
 - Apparent weight of the metal block.
- c) What are the environmental implications of our current methods for generating energy? [3]
- d) What is a resistance of a conductor? [1]

Question 5

- a) Tashi pushes a rock up a hill to a distance of 8 m with a force of 1500 N. The height of the hill is 5m. What is the work done by Tashi? [3]
- b) Define neutral equilibrium with an example. [2]
- c) Draw I-V graph for thermistor and also draw the symbol to represent it. [3]
- d) What is energy? Provide some examples of energy. [2]

Question 6

- a) State principle of moment and use it in solving the following questions. [5]



- Calculate CW moment.
 - Calculate CCW moment.
 - If a load is suspended at a distance of 0.8 m from the pivot, on the side of 100 N force, how much must the load weigh in order to bring the system to equilibrium?
- b) Define pure translational motion and provide an example. [2]
- c) Compare work and power. [3]

Question 7

- a) Explain any two ways to use energy efficiently. [4]

- b) What is gravitational field? Which of moon or earth will have more gravitational field and why? [3]
- c) A fire brigade pumps 2000 kg of water to a height of 15 m in 10 seconds to put off the fire. What is the power of the fire brigade? [3]

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