



MOTITHANG HIGHER SECONDARY SCHOOL  
THIMPHU THROMDE



“Every child is inspired to learn and empowered with wisdom to excel in life”  
TRIAL TERM EXAMINATIONS 2019

Physics

Marks: 100

Class X

Time: 2.15 Hours

Date:

Name: ..... Class & Sec. .... Roll No.: .....

Invigilator's initial

<i>For teacher's USE only</i>											
<i>Section A</i>						<i>Section B</i>					
<i>Question Number</i>	Q1 (a)	Q1 (b)	Q1 (c)	Q1 (d)	Q1 (e)	Q2	Q3	Q4	Q5	Q6	Q7
<i>Marks</i>	25	5	5	5	10	10	10	10	10	10	10
<i>Marks Awarded</i>											
<i>Total Marks Awarded</i>						<i>Teacher's Initial</i>					

**READ THE FOLLOWING INSTRUCTIONS 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 all the 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 the brackets [ ].
4. Read the directions to each question carefully and follow accordingly.

**Section A (50 Marks)**

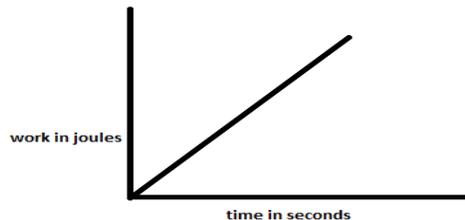
**Compulsory: Attempt All questions**

**Question 1**

**a. Each question in this section is provided with four possible options. Choose one of the most appropriate options and circle it. [25 x 1]**

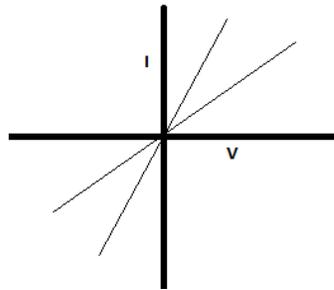
- i. A force of 20 N is applied by Deki brings 150 Nm moment of force. At what distance from the pivot is Deki applying the effort?
  - A. 7.5m
  - B. 75m
  - C. 750m
  - D. 7500m
- ii. When all the forces acting on the ball becomes zero, then it falls with
  - A. Zero velocity
  - B. Initial velocity
  - C. Final velocity
  - D. Terminal velocity
- iii. When the velocity of the falling object becomes equal to drag force, the object is said to be in
  - A. Stable equilibrium
  - B. Unstable equilibrium
  - C. Neutral equilibrium
  - D. Dynamic equilibrium
- iv. What happens to the total mechanical energy, when the object falls freely(without friction) towards the ground?
  - A. increase
  - B. Decrease
  - C. Remains same
  - D. Initially increase and the decrease
- v. Which of the following is the correct factor on which the pressure of liquid depends?
  - A. Mass of the body
  - B. Volume of the liquid
  - C. Depth of the liquid
  - D. Surface area of the liquid
- vi. Which of the following is best described by; ‘normal force acting per unit cross sectional area’?
  - A. Volume
  - B. Pressure
  - C. Weight
  - D. Friction

- vii. What is the pressure due to the water at the bottom of the swimming pool 8m deep?
- 78.400 Pa
  - 784.00 Pa
  - 7840.0 Pa
  - 78400 Pa
- viii. Which of the following will affect the pressure due to liquid?
- Density of the liquid
  - Gravitational force of earth
  - Height of the liquid column
  - All of the above
- ix. Which of the following statement correctly describes about the pressure of a liquid at a point?
- Pressure at any point in a liquid is always zero
  - Pressure at a point in a liquid is the same in all directions
  - Pressure at a point in a liquid is greater in downward directions
  - Pressure at a point in a liquid is greater in horizontal directions
- x. Sun is one of the renewable sources of energy. What does renewable mean?
- Can be reused
  - Can be recycled
  - Can be replaced
  - does not cause pollution
- xi. Which of the following would be the correct unit for the slope of the graph given below?



- watt
  - joule
  - second
  - newton
- xii. Which of the following is the major impact of the hydro power plants towards environment ?
- Change in the timing of the flow of water
  - Change in the temperature of water
  - Obstruction of the migration of the fishes
  - Occupation of large land areas by its huge structures
- xiii. A ball is thrown straight up and then fall straight back down. What would be the velocity of the ball when it attains its highest height?

- A. At its minimum
  - B. At its maximum
  - C. Equal to its displacement
  - D. Equal to acceleration due to gravity
- xiv. A car changes its direction but its speed remains constant. Which of the following quantity remains same?
- A. Distance
  - B. Momentum
  - C. Kinetic energy
  - D. Displacement
- xv. A hydraulic machine in an automobile workshop raises a 2000kg car to 500cm above the ground. What is the potential energy given to the car?
- A. 98.000 J
  - B. 980.00 J
  - C. 9800.0 J
  - D. 98000 J
- xvi. Calculate the work done when 2kg stone is thrown to a distance of 600cm?
- A. 1176 J
  - B. 1.176 J
  - C. 11.76 J
  - D. 117.6 J
- xvii. Which of the following is represented by the graph given below?



- A. Diode
  - B. Thermistors
  - C. Light dependent resistor
  - D. Incandescent bulb
- xviii. The following statements describe the induced voltage in an a.c generator.
- I. The magnitude of induced voltage depends on the speed of rotation of the armature coil
  - II. The magnitude of induced voltage depends on the number of armature coil
  - III. The direction of induced voltage depends on the strength of magnetic field

- IV. The direction of induced voltage depends on the number of turns of the armature coil
- A. I and IV
  - B. I and II
  - C. II and III
  - D. I and III
- xix. Which of the following unit is used in measuring the potential difference?
- A. volt
  - B. watt
  - C. joule
  - D. ampere
- xx. Which of the following is used in detecting the flow of induced current in an a.c generator?
- A. Fleming's left hand rule
  - B. Fleming's right hand rule
  - C. Right hand thumb rule
  - D. Ampere's swimming rule
- xxi. Which one is given out while doing welding of metals?
- A. Radio waves
  - B. Infrared radiation
  - C. Ultraviolet radiation
  - D. Micro waves
- xxii. The radio waves are used in broadcasting television and radio programs. The cable operators have antennas to receive signals in the form of radio waves. How do these waves travel?
- A. In transverse waves
  - B. In longitudinal waves
  - C. Both in longitudinal and transverse
  - D. None of the above
- xxiii. What does the cosmological redshift indicate?
- A. Expansion of black hole
  - B. Contraction of universe
  - C. Super massive black hole
  - D. Galaxies speeding away from us
- xxiv. Which one of the following is the unit for universal gravitational constant?
- A.  $\text{N}^2\text{m}^2\text{kg}^{-2}$
  - B.  $\text{Nmkg}^{-2}$
  - C.  $\text{Nm}^2\text{kg}^{-2}$
  - D.  $\text{N}^2\text{m}^2\text{kg}^{-1}$

- xxv. Which of the following best describes our galaxy that is Milky Way?
- A. An elliptical galaxy
  - B. An irregular galaxy
  - C. A dwarf galaxy
  - D. A spiral galaxy

**b. Match each item under Column A with the most appropriate item in Column B. Rewrite the correct matching pair in the space provided below. [5]**

Column A	Column B
1. Acceleration due to gravity	Electromotive force
2. Optical fiber	Andromeda
3. Closed circuit	Europa
4. Wind energy	Total internal reflection
5. Nearest galaxy to earth	Terminal voltage
	Dependent on mass of an object
	Arsenic
	Kinetic to mechanical energy

Column A	Column B

**c. Fill in the blanks by writing suitable words. [5]**

- i. Energy object possesses due to its position is called.....
- ii. The current flows in the electric circuit so long as ..... exists.
- iii. Electromagnetic waves carry ..... charge
- iv. Our sun is just one of many millions of stars in a group of stars called.....
- v. The sun derives its energy from fusion of hydrogen onto.....

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

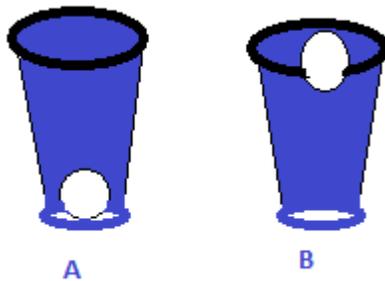
- i. The sun is now at the balance stage of its life
  
- ii. Star system is the unit of universe

- iii. In a transverse wave, the motion of the medium is parallel to the motion of the wave
- iv. For a thermistors, the current –voltage graph is a linear graph passing through the origin
- v. If the area of a n object is more, the pressure acting on the object will be less

**e. Answer the following questions: [10]**

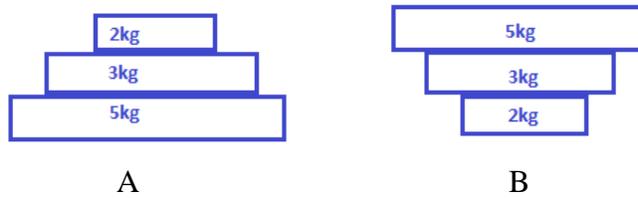
- i. Which tumbler has the higher centre of gravity? Why?

[11/2]



- ii. The boxes having different masses are staged below. In which case pressure will be more? Why?

[11/2]



- i) Why is there a need for economical and sustainable use of energy resources? [2]
- ii) Calculate the decrease in potential energy if a ball of 100kg is brought down from a height of 60m to 30m. ( $g = 10\text{m/s}^2$ ) [3]
- iii) Suppose your weight is 55kg and you are taking part in 200m race. How fast should you run so that your kinetic energy is 540J? [2]

**Section B (50 Marks)**

Attempt only *FIVE* questions

**Question 2**

- a. What would happen to the kinetic energy of a moving object if its velocity is doubled?[2]
- b. State two advantages of harnessing wind energy in our country [2]
- c. Calculate the amount of work done when a force of 50N displaces the object to a distance of 500cm. [2]

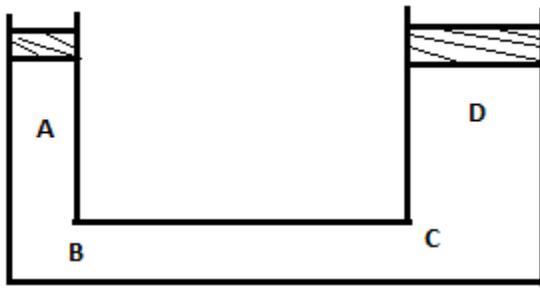
d. Give two examples of work done to be zero despite applying force. [2]

e. Calculate the amount of force required to throw 250 kg iron ball. [2]

### Question 3

a. A girl while playing with 80g box of dimensions 30cm x 40cm x 70cm hurts her toes due to maximum pressure exerted. Which face of the box dropped on her toes so that it exerted maximum pressure? Why do you think your answer is the correct one? [2]

b. A machine is filled with liquid and enclosed. Study the diagram given below and answer the following questions.



1. At which point the pressure will be equal to point A? Why? [2]

2. Which law is applicable in the above machine? [1]

c. A mechanic applied a force of 520N on an area of  $4\text{m}^2$  and lifted a car kept on  $10\text{m}^2$ . Calculate the weight of the car. [2]

d. Calculate the force required to lift a log of 400kf floating on water. Density of the log is  $34.5\text{kg/m}^3$  [3]

#### Question 4

- a. Define 1N [2]
- b. State three difference between step up and step down transformers [3]
- c. Name two electrical devices that works under the principle of electromagnetic induction [1]
- d. 340V runs through 200 coils. Calculate the number of turns required on the other end of the transformer to make the voltage of 550. Name the transformer. [3]

e. Define Ohmic conductor. Give one example. [1]

**Question 5**

a. Give two uses of gamma rays. [1]

b. Give two differences between Wi-Fi and blue tooth [2]

c. Give your two views on the statement, 'Digital system is important than analogue system'. [2]

d. Draw a diagram to represent the mode of travel for sound waves. [2]

e. Why do you think microwaves are used instead of radio waves to send signals to the satellites? [2]

f. Name the electromagnetic waves that has longest wavelength. [1]

**Question 6**

a. Explain law of universal gravitation. [2]

b. Explain your views on how scientists know that the universe is expanding. [2]

c. Name two celestial bodies which are likely to be habitable. [2]

d. Draw diagrams to show the difference in gravitational force due to change in mass only. [3]

e. Give two possible fates of the universe in the big Bang model. [1]

**Question 7**

a. Draw a graph to represent that diode is a non-ohmic conductor. [2]

