CHUMEY HIGHER SECONDARY SCHOOL.
BUMTHANG
Annual Examination 2022

Subject: Physics.   **Time: 2Hrs**
Class: IX   **Full Mark: 100**
Student Code…………………………………………..

Directions
- ✓ The first 15 minutes of the examination are for reading the QA papers only. You must not start writing during this time.
- ✓ This paper has two sections A and B.
- ✓ Section A contains objective questions and all questions are compulsory.
- ✓ Section B contains extended response questions, wherein you have to answer **ALL** the questions.

SECTION A [40 MARKS]
ANSWER ALL QUESTIONS

Question 1

a)   **Directions: For each question, there are four alternatives A, B, C and D. Choose the correct alternative and circle it with PEN.**   **[20]**

i.   The slope of the straight line in a distance-time graph indicates;
       A. speed of a moving body.
       B. velocity of a moving body.
       C. acceleration of moving body.
       D. distance travelled by a moving body.

ii.   The graph alongside shows Sonam's journey from her school to her home. What does part BC indicate?
       A. Sonam reached her home
       B. Sonam took rest for a while.
       C. Sonam started her journey from school.
   D. Sonam is walking along the straight path.
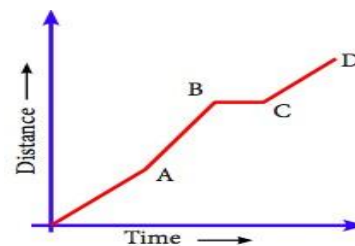
iii.   What would be the initial velocity of the body moving from rest?
       A. 0 m/s.
       B. 1 m/s.
       C. -1 m/s.
       D. More than 1 m.

iv.   Which of the following statement is true about the given figure?
       A. Pressure at point A is greater than pressure at point B.
       B. Pressure at point B is greater than pressure at point A.
       C. Pressure at point A and point B are different.
       D. Pressure at point A and point B are same.
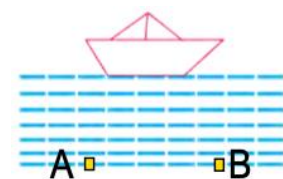
v.   If a momentum of a body is 50Kgm/s, and it's mass is 5 kg. Then the velocity will be
     A. 10m/s
     B. 45m/s
     C. 55m/s
     D. 250m/s

vi. According to Newton's First Law of Motion, an object will
     A. slow down when moving down a hill.
     B. stay in motion unless acted upon by an outside force.
     C. stay in motion when it is acted upon by an outside force.
     D. always moves sideways when acted upon by an outside force.

vii. If the pressure exerted by an object is Z to the surface area Y. The force A can be
     calculated by using the formula
         A. A=ZxY
         B. A=Z/Y
         C. Z=AxY
         D. Y=A/Z

viii. The amount of heat required to raise the temperature of a substance by 1°C is known as
         A. Latent heat.
         B. Heat Capacity
         C. Specific heat capacity.
         D. Specific latent heat capacity.

ix. Which property of gas is demonstrated by the
     balloon in the diagram (b)?
     A. Hot air.
     B. Hot air and beaker.
     C. Expansion of the balloon.
     D. Thermal expansion of gas.
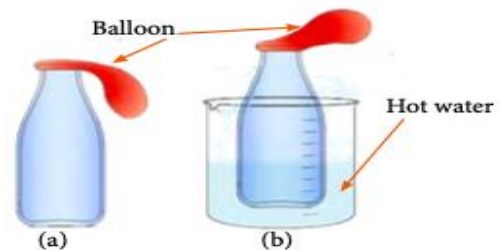
x.   Vegetables and fruits are usually kept in cold storage rooms in order to keep them fresh
     for longer time. These cold storage rooms have;
     A. cold walls.
     B. thick walls.
     C. double walls.
     D. transparent walls.

xi. AC generators works on the principle of;
         A. Newton's law.
         B. Lorentz' force.
         C. Archimedes' principle.
         D. Electromagnetic induction.

xii. When light passes from rarer medium to denser medium, the light
         A. does not bend at all.
         B. bends towards the normal.
         C. bends away from the normal.
         D. reflect back in the same medium.

xiii.   Mr. Tandin Penjor is singing a boedra song by playing dramnyen which produces a transverse wave of 20 Hz with the velocity of 20m/s. The wavelength for this wave will be
    A. 400 m.
    B. 40 m.
    C. 1 m.
    D. 0 m.

xiv.   The mass of the school bus is 2000 kg. If it travels with an acceleration of 5 m/s^2, what is the force developed by bus?
    A. 400 N.
    B. 1000 N.
    C. 10000 N.
    D. 20000 N.

xv.   Lunar exploration is important for mankind as it helps us to
    A. know more about moon.
    B. build human settlement on the moon.
    C. Send more satellite and people on the moon.
    D. learn about the past and get a glimpse of future.

xvi.   A current of 0.5 ampere flows through a conductor when a charge of 2.5 coulomb passes through a point in certain time. What is the time taken by the charge to pass through the point in the wire?
    A. 2 seconds.
    B. 3 seconds.
    C. 4 seconds.
    D. 5 seconds.

xvii.   In 1957, which satellite was launched as first artificial Earth satellite on the moon?
    A. Luna 1.
    B. Sputnik 1.
    C. Surveyor 1.
    D. Chandrayaan 1.

xxiii. Weather forecasting is done by observing the barometric reading. Which of the following observation indicates the storm?
    A. Sudden increase in the barometric height.
    B. Gradual increase in barometric height.
    C. Sudden fall in the barometric height.
    D. Gradual decrease in barometric height.

xix.   Bats comes out at night in search of prey. When they fly, the produce sounds and listen to the echo to avoid obstacles and to locate the prey. The type of sound waves used by the bats are;
    A. infrasonic waves.
    B. ultrasonic waves.
    C. transverse waves
    D. longitudinal waves

xx.   …………………… made the first crewed landing on the moon
        A.   Apollo 11
        B.   Apollo 15
        C.   Apollo 16
        D.   Apollo 17

b)   Fill in the blanks by writing the most suitable words.   **[10]**
i.   The slope of displacement-time graph represents …………………………..

ii.   The angle between refracted ray and normal is called……………………..

iii.   The phenomenon of bouncing back of light ray into the denser medium when the angle of incidence in the denser medium is ……………..than the critical angle is called the total internal reflection.

iv.   The D.C motor converts electrical energy into ………………….energy.

v.   Speed of the body in a particular direction is known as………………………

c)   Write whether the following statement is TRUE or FALSE   **[5]**
i.   Light waves must travel from rarer to denser medium for total internal reflection. [   ]

ii.   RADAR is used by aircraft to locate the enemy aircraft. [   ]

iii.   Induced voltage exists in the circuit so long the change in the magnetic field continues.[   ]

iv.   Current in the circuit always flows from negative to positive terminals. [   ]

v.   The reaction that occurs involving the electron is called nuclear reaction. [   ]

d)   Match each item under Column A with the item in Column B. Rewrite the correct   [5] pairs by writing the alphabet against the number in the space provide.

Column A	Column B	Answer
1. Acceleration	a. Superficial expansion	1 =
2. Lactometer	b. moving charged particles in magnetic field	2 =
3. Increase in Area	c. Principle of hydrometer.	3 =
4. Fleming's left hand rule	d. rate of change of velocity.	4 =
5. Depth of sea	e. Cubical Expansion	5 =
	f. direction of induced current.	
	g. SONAR	

SECTION B [60 Marks]
ATTEMPT ALL THE QUESTIONS

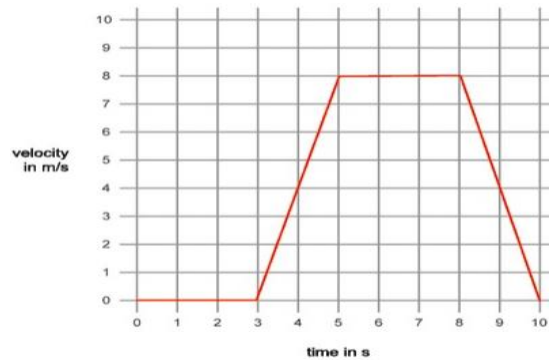**Question 2.**

a)   Write any two conclusions we can make from the distance-time graph   **[2]**

b)   Why do astronauts wear space suits?   **[2]**

c)   The figure below shows velocity-time graph for car travelling in a straight line along a road.

    i. Calculate the acceleration between t=3s and t=5s. **[2]**

    ii. Calculate the distance travelled by the body.   **[2]**

d)   Water is used as coolant in the car. Justify.   **[2]**

Question 3

a) Classify the following situations as examples of Newton's first law, second law **[2]** and third law. Justify your classification.

    i.   A person pulls a table cloth swiftly and plates and mugs remain on the table.

    ii.   Pushing a child on a swing is much easier than an adult on it.

b) State the conditions for total internal reflection. **[2]**

c) For a ray of light passing from air to glass with an angle of incidence 50o and **[3]** angle of refraction 30o. What will be the refractive index of glass?

d) State Archimedes' principle. **[1]**

e) Differentiate between mechanical wave and electromagnetic waves using some daily examples of waves. **[2]**

Question 4.

a) Explain two applications of Thermal Insulation. **[2]**

b) A sports car accelerates 0 to 30 m/s in 10s. If the car exerts a force of 4306N. What is the mass of the car? **[3]**

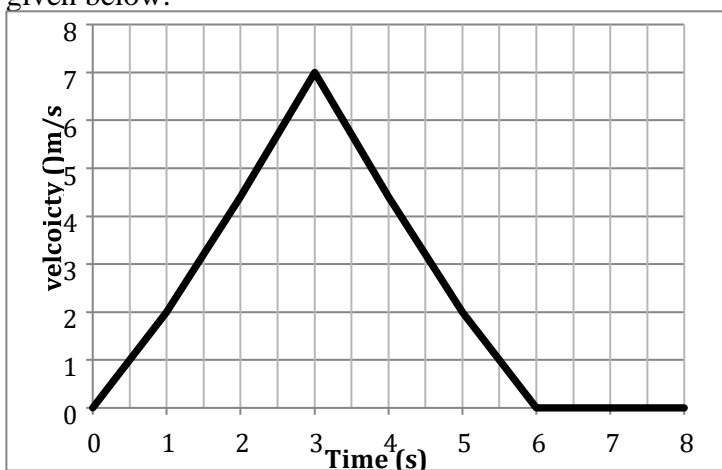**c)** Mention three factors affecting the pressure at a point inside the liquid. **[3]**

d) State any two types of thermal expansion. **[2]**

Question 5.

a)   Draw a simple DC motor and label its parts.   **[3]**

b)   How is alternating current different from direct current?   **[2]**

c)   Calculate the total distance travelled by studying the velocity- time graph   **[3]**
   given below.

d) Define the following terms. **[2]**
      i.   Wavelength

      ii.   Frequency

Question 6.

a) A charge of 1coulomb passes through a cross-section of a conductor in 2 seconds. Calculate the current flowing through the conductor. **[2]**

b) State the laws of refraction of light. **[2]**

c) A transverse wave passes through a medium as shown in the figure below. Find its wavelength, amplitude and frequency if its velocity is 330 m/s. **[4]**
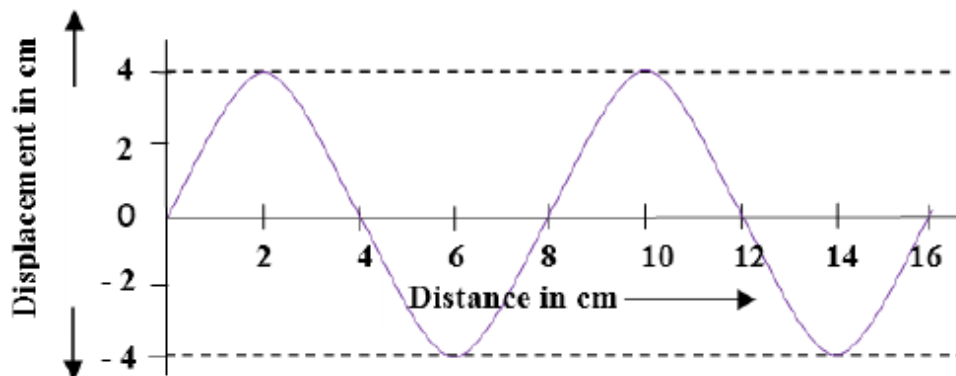
d) State at least two applications of total internal reflection. **[2]**

Question 7.

a) Write two differences between speed and velocity. **[2]**

b) Why a person sitting in a bus falls forward when the bus suddenly stops. **[2]**

c) What is the significance of exploring moon in the scientific world? **[2]**

d) Tenzin found the temperature of her aluminium container of mass 500 g fell from 50°C to 35°C. Find the amount of heat lost by the container. Take specific heat capacity of aluminium as 900Jkg^{-1}°C^{-1}. **[2]**

e) What is the atomic and mass number for the given element? **[2]**

$$^4X_2$$