Alternative No:

Index No: | **0** | **1** | **0** | **0** | **9** | | | | | |

Supervising Examiner's/Invigilator's initial:

Paper 1 (Physics)   **Writing Time: $1\frac{1}{2}$ Hours**

NEW CURICULUM   **Total Marks : 80**

READ THE FOLLOWING DIRECTIONS CAREFULLY:

1. Do **not** write for the first **fifteen minutes**. This time is to be spent reading the questions. After having read the questions, you will be given **one and a half hours** to answer all questions.

2. Write your **index number** in the space provided on the **top right hand corner of this cover page only**.

3. In this paper, there are **two** sections: A and B. Section **A** is compulsory. You are expected to attempt **any four** questions from Section **B.**

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

5. Read the directions to each question carefully and write **all** your answers in the space provided in the **question booklet** itself.

6. Remember to write **quickly** but **neatly**.

7. **Do not** remove or tear off any pages from the question booklet.

8. **Do not** draw lines or pictures **on** or in the question booklet to beautify it.

9. **Do not** leave the examination hall before you have made sure that you have answered all the questions.

For Chief Marker's and Markers' Use Only

Question Number														Total	Chief Marker's Signature ↓
Award															
Markers' initial →															

SECTION A (40 Marks)

Compulsory: To be attempted by all candidates.

Question 1

(a) ***Directions: Each question in this part is followed by four possible choices of answers. Choose the correct answer and write it in the space provided.*** **[15]**

(i) The gravitational unit of force is

    A   Newton.
    B   Dyne.
    C   Kgf.
    D   Kg.

    Answer:……………………………………………………………………………

(ii) A single fixed pulley is used because it

    A   gives 100% efficiency.
    B   has a low velocity ratio.
    C   has a high mechanical advantage.
    D   helps to apply the force in a convenient direction.

    Answer:…………………………………………………………………………….

(iii) The total internal reflection occurs when the angle of incidence is

    A   equal to the critical angle.
    B   less than the critical angle.
    C   greater than the critical angle.
    D   equal to the angle of refraction.

    Answer:……………………………………………………………………………

(iv) If the barometric height suddenly falls, it indicates

    A   fair weather
    B   arrival of rain.
    C   arrival of storm.
    D   arrival of cyclone.

    Answer:……………………………………………………………………………

(v)   When an object is placed at a distance *2f* from a convex lens of focal length *f*, the image formed will be

A   same size.
B   at infinity.
C   magnified.
D   diminished.

Answer:…………………………………………………………………………………

(vi)   The diagram below shows two incident rays A an B which emerge out. The device used in the box marked 'X' is a
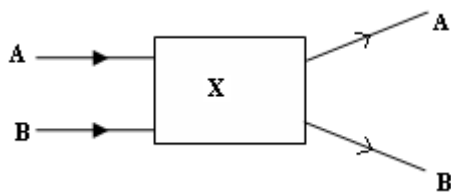
A   prism.
B   convex lens.
C   concave lens.
D   concave mirror.

Answer:…………………………………………………………………………………

(vii)   The pressure inside a liquid with density '*d*' at depth '*h*' is

A   *hdg*.

B $\dfrac{h}{dg}$.

C $\dfrac{hd}{g}$.

D   *hd*.

Answer:…………………………………………………………………………………

(viii) Which of the following combination of statements given below best describes a noise?
I.   Sudden changes of loudness or intensity.
II.   No sudden changes of loudness or intensity.
III.   Frequency is generally low.
IV.   Frequency is generally high.

A   I and II
B   I and III
C   II and IV
D   III and IV

Answer:………………………………………………………………………………

(ix)   If a length of a given wire is doubled by stretching it, its resistance will increase by

A $\frac{1}{4}$ times.

B $\frac{1}{2}$ times.

C   2 times.
D   4 times.

Answer:………………………………………………………………………………

(x)   When the MCB of a house circuit is switched off, it disconnects the

A   live wire.
B   earth wire.
C   neutral wire.
D   live and neutral wire.

Answer:………………………………………………………………………………

(xi)   A fuse wire must have

A   low resistance and high melting point.
B   high resistance and low melting point.
C   low resistance and low melting point.
D   high resistance and high melting point.

Answer:………………………………………………………………………………

(xii)   When a body of mass 5 kg falls from a height of 1000 cm, the energy possessed by it is

A   50J.
B   500J.
C   5000J.
D   50000J.

Answer:……………………………………………………………………………………

(xiii) Steam produces more severe burns than water at 100ºC because

A   the temperature of steam is much higher than that of water.
B   steam has high specific heat capacity.
C   water has high specific heat capacity.
D   of the latent heat of steam.

Answer:……………………………………………………………………………………

(xiv)   When a beam of electrons travel through a uniform magnetic field, it follows a

A   parabolic path.
B   circular path.
C   straight path.
D   random path.

Answer:……………………………………………………………………………………

(xv)   The statements given below are methods to increase the sensitivity of a galvanometer **EXCEPT**

A   taking a coil of small area.
B   taking a thin and long suspension fibre.
C   increasing the number of turns in the coil.
D   increasing the strength of the magnetic field.

Answer:…………………………………………………………………………………….

(b) *Match each item under Column A with the most appropriate item in Column B. You must rewrite the correct matching pairs in the space provided.*

Column A	Column B
(i) Work	(a) frequency
(ii) Pascal's law	(b) virtual, erect
(iii) Knife	(c) second class lever
(iv) Concave lens	(d) hydrometer
(v) Loudness	(e) vector
	(f) amplitude
	(g) scalar
	(h) hydraulic break
	(i) third class lever
	(j) real, inverted

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

(i) The apparent weight of a floating body is …………………

(ii) The apparent loss of weight of a stone in water is due to ……….

(iii) When a soft iron bar is introduced inside a current carrying solenoid, the magnetic field inside the solenoid will ………………..

(iv) A fuse is connected in series to the ……………….. wire.

(v) Pieces of ice cool the drinks better than water at 0ºC because 1g of ice takes ……………….. of heat from drinks to melt into water at 0ºC.

(d) *Rewrite the following statements by correcting ONLY the letters in BOLD.* **[5]**

(i) To photograph a fast moving object, it is desirable to have **small** aperture and high shutter speed.

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(ii)   When the internal resistance is negligible, the emf will be **greater** than the terminal

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(iii)   The echo of a sound is not heard in a small room as it overlaps with the **natural** sound.

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(iv)   A red flower appears **red** with green leaves when it is viewed in pure green light.

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(v)   In **series** connection of resistors, the equivalent resistance is equal to the sum of reciprocal

of individual resistance.

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(e)   *Answer the following questions.*

(i)   How does the resistance of a wire depend on its length and area?   **[2]**

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(ii)   What will be the angle of refraction, when a ray of light falls normally on a glass block? **[1]**

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(iii) Calculate the heat required to raise the temperature of 42g of water from 50ºC to 60 (Given specific heat capacity of water = 4.2 J/g ºC)

(iv) State *one* difference between photographic camera and human eye in terms of their focussing in the table given below. **[1]**

Photographic camera	Human eye

(v) How does β – particle differ from an ordinary electron? **[1]**

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(vi) What happens to the mass number of an element when a β – particle is emitted? **[1]**

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(vii) Why does the Newton's colour disc painted with VIBGYOR appear greyish or dull white when rotated rapidly? **[1]**

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(viii)   Mark the magnetic polarity at the ends A and B in the diagram given below.
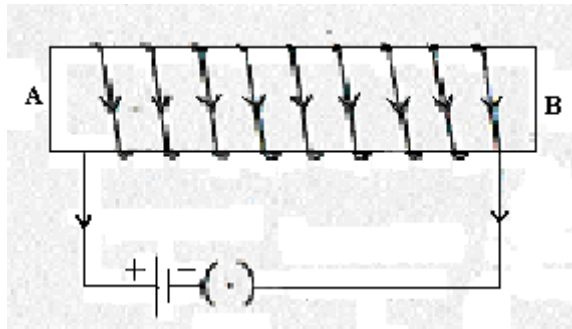
SECTION B (40 Marks)

Attempt any four questions

Question 2

(a)   (i)   State Newton's Second law of motion.   **[1]**

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(ii)   Write the expression related to Newton's Second law of motion.   **[½]**

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(iii)   A body does 50 joules of work in 5 seconds. What is the power developed?   **[1½]**

(b)   A rectangular coil ABCD is placed between the pole pieces of a horse shoe magnet as shown in the diagram given below.
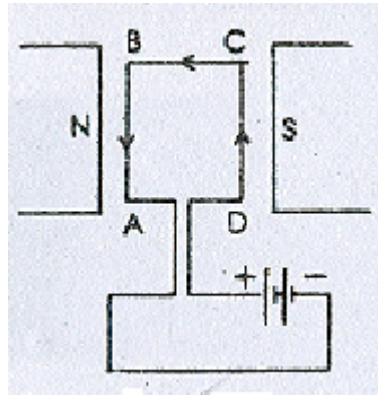
(i)   What is the effect of the force on the coil?   **[1]**

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(ii)   How does the effect of the force on the coil change if the terminals of the battery are interchanged?   **[1]**

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(c)   (i)   Name the radiation A and B emitted in the following radio active decay.   **[2]**

1. $^{226}X \rightarrow\ ^{222}_{86}Y + A$

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2. $^{24}_{11}P \rightarrow\ _{12}Q + B$

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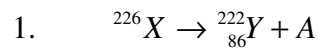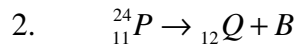
(ii)   Which of the radiations alpha, beta and gamma:

      1.   causes maximum biological damage?

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      2.   has highest ionizing power?   **[1]**

………………………………………………………………………………………………

(iii)   Pema found the weight of an object in air, water and sea water.   **[1]**

      1.   The weight is less in ………………….

      2.   The weight is more in ………………….

Question 3

(a)   (i)   State the S.I units of   **[1]**

      1.   electrical power.

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      2.   electrical energy.

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(ii)   What is the present international colour coding of   **[1]**

      1.   live ware?

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      2.   neutral wire?

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(iii) State *two* advantages of a pivoted type of galvanometer over a suspended type

of galvanometer.   **[2]**

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(b)   Is it possible to burn a piece of paper using a convex lens in daylight without using matches or any other direct flame? Draw a diagram to support your answer.

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(c)   Calculate the equivalent resistance between points A and B from the diagram given below.   **[2]**
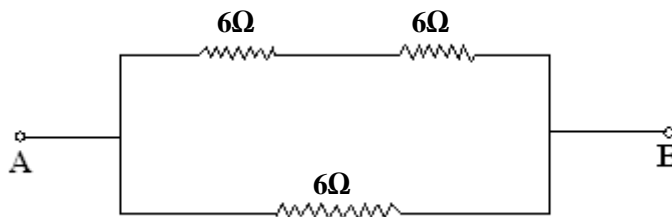
(d) The diagram given below shows the rays of light traveling from source 'S' placed at the bottom of the beaker containing water. Study the diagram and answer the questions that follow.

    (i)   Complete the ray marked with two arrows. **[1]**
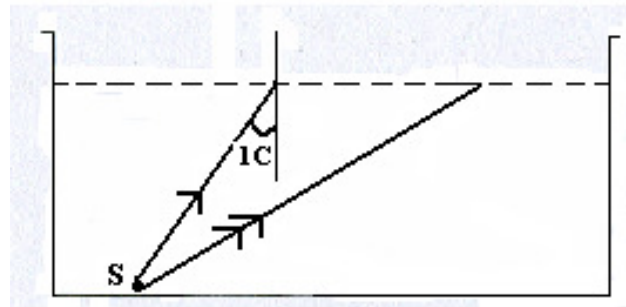
    (ii)   State *one* condition necessary for the phenomenon exhibited by the ray marked with two arrows. **[1]**

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Question 4

(a) (i) What is the minimum distance between the source of sound and a reflector so that an echo can be heard distinctly? **[1]**

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    (ii)   What is 1 Ohm? Write the mathematical expression for resistance. **[2]**

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(b) The diagram below shows a lever in use. Study the diagram and answer the
     questions that follows
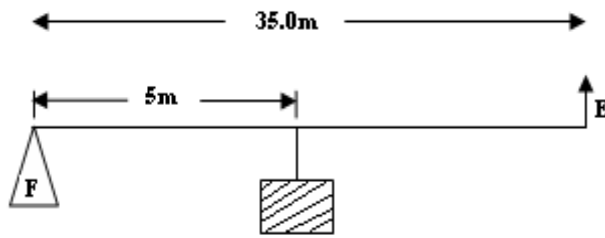
(i) What is the mechanical advantage of the lever?   **[1]**

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(ii) What is the effort required to lift a load of 20 kg?   **[1]**

(c) (i) Give *two* reasons why a machine cannot be 100% efficient?   **[2]**

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(ii)   A lens having focal length of 2 cm forms a virtual, erect and magnified image of an object. Complete the ray diagram given below.
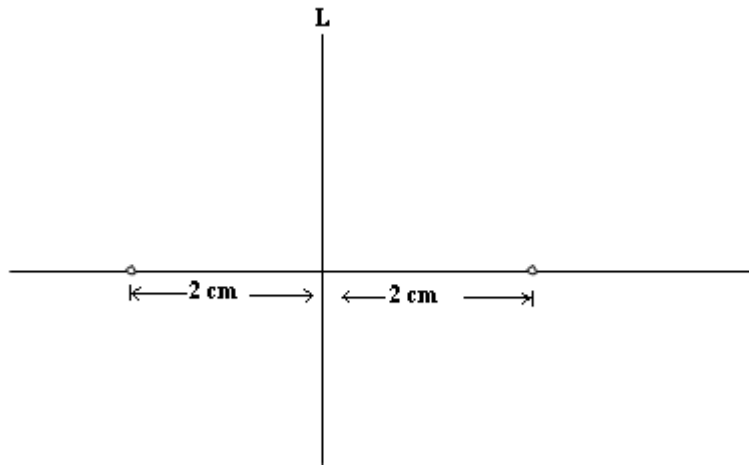
(iii) What will happen to the film in a camera, if the exposure time is more than 1 second in day light?   **[1]**

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Question 5

(a)   (i)   Define specific latent heat of fusion.   **[1]**

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(ii) Why are infra-red radiations used for photography in foggy conditions? Explain.   **[2]**

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(iii)   A man shouts in front of a building 167 m away. If the speed of sound
         is 334 m/s, calculate the time when his echo can be heard.

(b)   (i)   Can water be used in a barometer instead of mercury? Justify your answer with
              a reason.   **[1]**

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       (ii)   Why does an iron nail float in mercury and sink in water?   **[2]**

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(c)   A pumpkin was weighed at Phuentsholing and at Gasa. In which place will the pumpkin
       weigh more? Justify your answer.   **[2]**

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Question 6

(a) (i) The specific heat capacity of water is 4200J/kg°C. What information does
it convey? **[1]**

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(ii) Explain the following statements.

1. β - particles are deviated to a greater extent in a magnetic field than
α - particles. **[1]**

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2. γ - rays are not deflected in an electric field. **[1]**

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(b) (i) An electric oven is heated at 1500W, 250V and draws a current of 6A.
If it is connected to a 250V mains, calculate the cost of energy consumed
in 20 hours at the rate of Nu. 2 per unit. **[3]**

(i) Why is copper preferred over aluminum to make calorimeters?

Give *two* reasons.

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(c) A torch bulb when cold has 2 Ω resistance. It draws a current of 0.6A when glowing from a source of 6V.

(i) Calaculate the resistance when the bulb is glowing. **[1]**

(ii) Why is there a difference in the resistance? **[1]**

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Question 7

(a) Give reasons for the following. **[3]**

(i) Church bells are very large in size.

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(ii)   We usually cup our hands to make a loud sound.

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(iii)   Marching troops are usually asked to break their steps while crossing a bridge.

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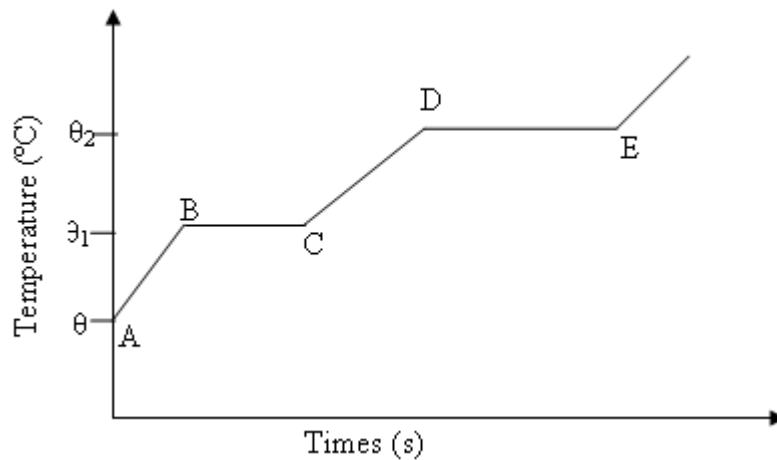…………………………………………………………………………………………………

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(b)   The diagram below shows the change of state of a substance on a temperature time graph. **[2]**

Why is the part BC shorter than DE?

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(c)   (i)   How is heat capacity related to specific heat capacity?

(ii)   A solid weighs 55 gf in air and 45 gf when completely immersed in water.

Calculate the relative density of the solid.   **[2]**

(iii)   Is any work done by a body when moving in a circular path? Justify.   **[1]**

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