Alternative No:

Index No: | 0 | 1 | 0 | 1 | 3 | | | | | |

Supervising Examiner's/Invigilator's initial:

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

Total Marks : 80

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 **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 page 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															
Section		**A**						**B**							
Question Number	**1**a	**1**b	**1**c	**1**d	**1**e	**2**	**3**	**4**	**5**	**6**	**7**			**Total**	**Chief Marker's Signature ↓**
Award															
Markers' initial →															

SECTION A (40 Marks)
Compulsory: Attempt all questions.

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) If a body weighs 600N on earth, its weight on the moon will be

A 60N.
B 100N.
C 600N.
D 6000N.

Answer:………………………………………………………………………………

(ii) One horse power is equal to

A 476W.
B 467W.
C 746W.
D 764W.

Answer:………………………………………………………………………………

(iii) In which class of levers is the mechanical advantage always more than one?

A Class I
B Class II
C Class III
D Class 1 & III

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

(iv) All the following statements are correct **EXCEPT**

A mercury is used in an aneroid barometer.
B pressure decreases with increase in altitude.
C hydraulic brakes function based on Pascal's law.
D altimeter measures altitude and atmospheric pressure.

Answer:………………………………………………………………………………

(v)   Which of the following liquids will provide the maximum buoyant force?

     A   kerosene oil
     B   pure water
     C   sea water
     D   mercury

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

(vi)   The sparkling of diamonds is because of

     A   reflection of light.
     B   refraction of light.
     C   total internal refelection.
     D   critical angle of diamond.

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

(vii)   The size of the pupil in a human eye ball is controlled by the iris. Similarly, the size
     of the aperture in a photographic camera is controlled by the

     A   diaphragm adjusting ring.
     B   converging lens.
     C   focussing ring.
     D   ring shutter.

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

(viii) Which of the following cases will the image formed by a convex lens be virtual,
     upright and magnified?

     A   When the object is between F_1 and optical centre.
     B   When the object is between F_1 and $2F_1$.
     C   When the object is at infinity.
     D   When the object is at F_1.

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

(ix)   The colour combination which gives white colour is

     A   blue and yellow.
     B   green and blue.
     C   red and green.
     D   red and blue.

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

(x)   Bats and dolphins are able to detect obstacles with the help of

     A   echoes.
     B   sound.
     C   light.
     D   heat.

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

(xi)   Ohm metre is the SI unit of

     A   electrical resistance.
     B   potential difference.
     C   electric current.
     D   resistivity.

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

(xii)   A fuse is always connected to the

     A   three pin plug.
     B   neutral wire.
     C   earth wire.
     D   live wire.

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

(xiii)   The ratio of turns in the secondary coil to those in the primary coil in a transformer, which steps down 220V to 11V, is

   A   20:1.
   B   1:20.
   C   10:1.
   D   1:10.

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

(xiv)   The heat required to raise the temperature of 50g of water through 10ºC is
   (use Specific heat capacity of water = 4200 Jkg^{-1} ºC^{-1})

   A   500J.
   B   2100J.
   C   2500J.
   D   3000J.

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

(xv)   The particle 'X' emitted in the disintegration $_{92}^{238}U \longrightarrow _{90}^{234}Th + _{2}^{4}X$ is

   A   a gamma particle.
   B   an alpha particle.
   C   a X-ray particle.
   D   a beta particle.

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

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

Column A	Column B
1. Atmospheric pressure	(a) volt
2. Refraction	(b) electrical to mechanical energy
3. D.C motor	(c) ampere
4. Potential difference	(d) f-number
5. Aperture	(e) 76 mm of mercury
	(f) lens
	(g) mechanical to electrical energy
	(h) mirror
	(i) shutter
	(j) 76 cm of mercury

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

(i)   The work done by a body moving in a complete circular path is ....

(ii) A man carrying a load on a wheel barrow uses .... Class lever.

(iii) Vibrations of a simple pendulum in air is an example of ....
      vibrations.

(iv) The total resistance of a 2Ω and 4Ω resistors connected in parallel is .... Ω.

(v)   An increase in pressure will .... the boiling point of water.

(d) *Correct the following statements by changing the underlined word/s ONLY.*
       Rewrite the correct word/s ONLY.   **[5]**

(i)   The electromagnetic radiations beyond red end of the visible spectrum are
      called <u>ultraviolet</u> radiations.

………………………………………………………………………………………………………

(ii) The sound that produces a pleasant effect on our ear is called <u>noise</u>.

………………………………………………………………………………………………………

(iii) Two notes of the same pitch and loudness given by two different instruments
      can be distinguished from each other by their <u>amplitude</u>.

………………………………………………………………………………………………………

(iv) The current flowing through a metallic conductor at a constant temperature
      is proportional to the <u>resistance</u> applied to its end.

………………………………………………………………………………………………………

(v)   In a cathode ray tube, the X-plates and Y-plates together form the <u>electron gun</u>.

………………………………………………………………………………………………………

(e) *Answer the following questions:*

(i)   List down *two* factors affecting upthrust.

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(ii)   Define power of lens and state its unit.   **[2]**

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(iii)   An electric bulb is marked 250W, 230V. How much energy does it consume in

1.   10 hours?   **[1]**

2.   150 minutes?   **[1]**

(iv) Write *two* differences between heat capacity and latent heat in the table given below.

Heat capacity	Latent heat

(v) A bismuth isotope $^{214}_{83}\text{Bi}$ undergoes decay and changes to polonium isotope $^{214}_{84}\text{Po}$. What particle was emitted? Support your answer with reasons. **[2]**

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…………………………………………………………………………………………………
…………………………………………………………………………………………………
…………………………………………………………………………………………………

SECTION B (40 Marks)

Attempt any four questions.

Question 2

(a) (i) Give *two* differences between potential and kinetic energies in the table given below. **[2]**

Potential energy	Kinetic energy

(ii)   Study the graph given below and explain what it means.

....

....

....

....

....

....
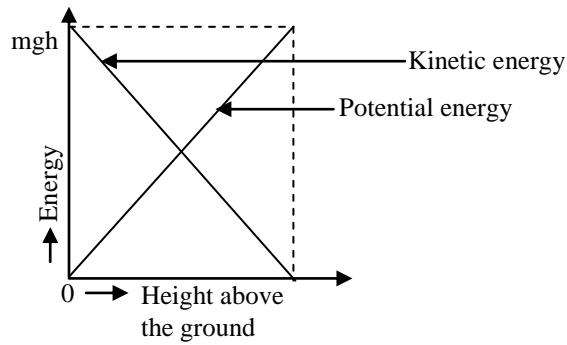
(b)   (i)   What force is required to accelerate a 500kg car from 5m/s to 30m/s in 10s?   **[2]**

(ii)   How is force related to the momentum of a body?   **[1]**

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(c)   (i)   Give *two* examples of a Class I lever.

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    (ii)   The following figure shows an arrangement of a single moving pulley.

            Study the diagram carefully and answer the questions that follow:
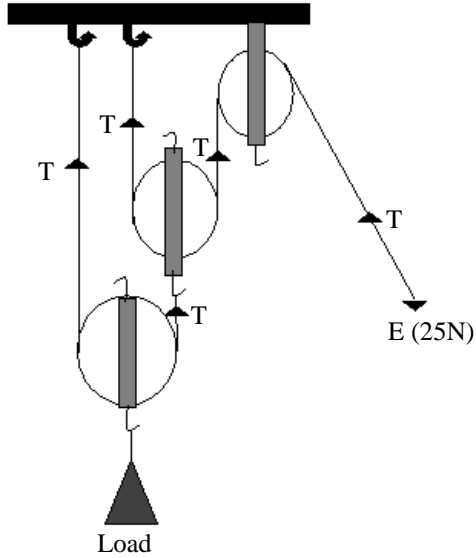
Load

1.   Calculate the mechanical advantage of the system.   **[1]**

2.   Calculate the load that can be lifted by an effort of 25N.   **[1]**

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3. Define one pascal.

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Question 3

(a) (i) It is easier to cut vegetables with a sharp knife than with a blunt one. Why? **[1]**

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……

(ii) A ship sinks deeper in the river than in the sea. Explain. **[1]**

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……

……

(iii) Define the following terms: **[2]**

1. Principal axis

……

……

……

……

……

2. Optical centre

………

………

………

………

(b) (i) Define density and state its SI unit. **[1]**

………

………

………

………

………

(ii) The density of mercury is 13.6×10^3 kgm^{-3}. Calculate its relative density. **[2]**

(c) (i) Define critical angle for a pair of media. **[1]**

………

………

………

………

………

(ii)   In the diagram given below, a ray of light is incident on an equilateral glass prism for which the critical angle is 42º.

1. Complete the ray AB marked with an arrow after they meet the glass-air boundary.   **[1]**
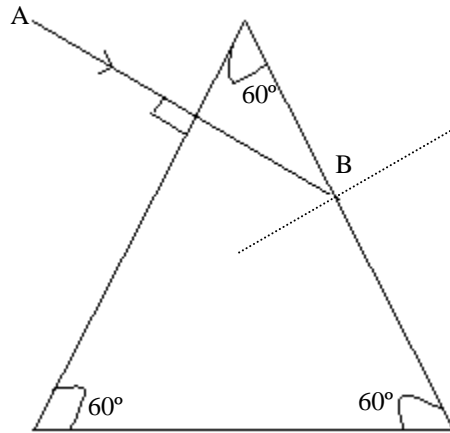
2.   Name the phenomenon exhibited by the ray.   **[1]**

……………………………………………………………………………………………………

……………………………………………………………………………………………………

Question 4

(a)   (i)   Write *two* differences between a converging and a diverging lens in the table given below.   **[2]**

Converging lens	Diverging lens

(ii)   Why is the inner side of a camera coated black?

………………………………………………………………………………………………

………………………………………………………………………………………………

………………………………………………………………………………………………

(iii)   List down any *two* pairs of complementary colours.   **[2]**

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(b)   (i)   Write *one* function each for the parts labeled A and B in the diagram given

below.   **[2]**

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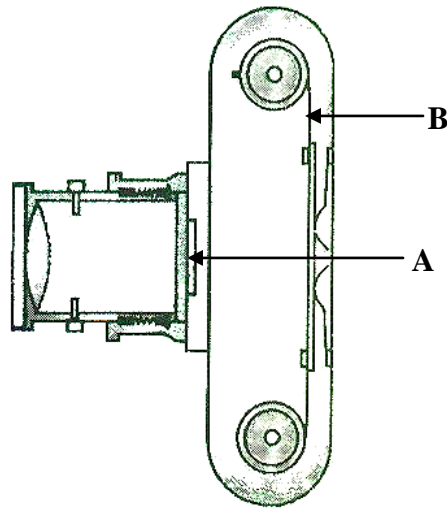
(ii)   Yangzom uses blue and red filters together on the path of a light ray.

What is the colour of the final emerging light?   **[1]**

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(iii)   Santosh stands 200m away from a high wall and blows a whistle.

He hears the echo after 1.2s. Calculate the velocity of the sound.

Question 5

(a)   (i)   Explain the following terms: **[2]**

1.   pitch

……………………………………………………………………………………………………

……………………………………………………………………………………………………

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……………………………………………………………………………………………………

2.   loudness

……………………………………………………………………………………………………

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(ii)   What is the minimum distance required to hear an echo? Why?   **[2]**

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(b) (i) How does the electrical resistance of a wire change with the change in the

   1. length of the wire?

   …………………………………………………………………………………………………
   …………………………………………………………………………………………………
   …………………………………………………………………………………………………
   …………………………………………………………………………………………………

   2. temperature of the wire? **[1]**

   …………………………………………………………………………………………………
   …………………………………………………………………………………………………
   …………………………………………………………………………………………………
   …………………………………………………………………………………………………

(ii) Two resistors of 2Ω each are connected in series and in parallel connection

   as shown below. In which case will the total resistance be less and why? **[2]**
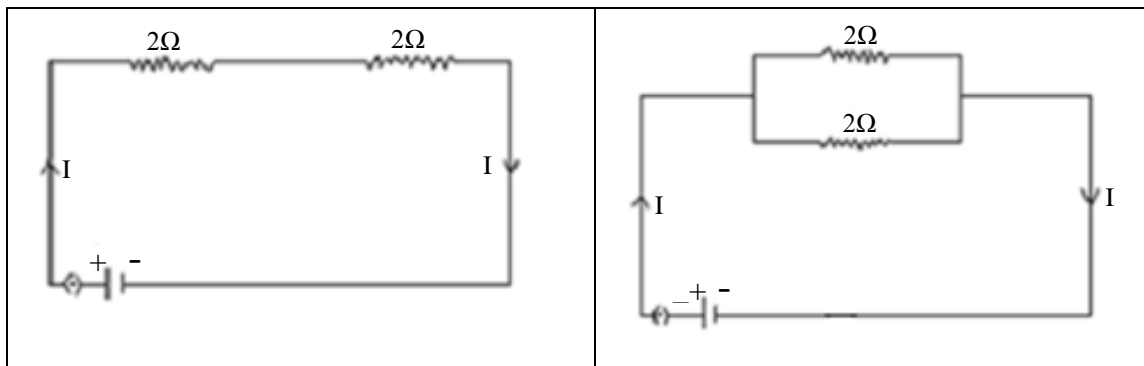
2Ω 2Ω	2Ω
I I	2Ω
+ –	I I
	– + –
Series connection	**Parallel connection**

……
……
……
……
……
……

(c)   Calculate the following:

   (i)   the total resistance between the points X and Y.
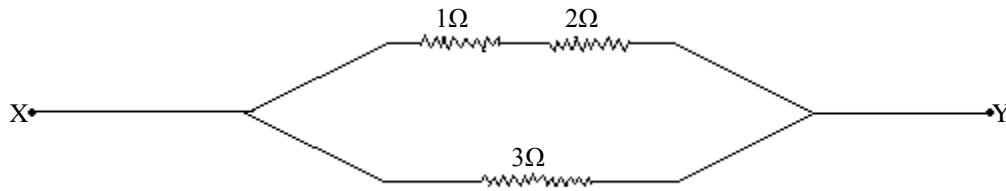
   (ii)   The energy released by a heater which draws a current of 5A at 220V

          for 1 minute.   **[1]**

Question 6

(a) (i) Differentiate between a safety fuse and cartridge type fuse in the table given

below. **[1]**

Safety fuse	Cartridge type fuse

(ii) State *two* ways to increase the sensitivity of a galvanometer. **[2]**

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(b) Mr. Sonam uses five 60W electrical bulbs and four 40W fluorescent tubes in his

house for 8 hours. Calculate the cost of electricity used, if electric energy cost is

Nu. 2 per KWh. **[3]**

(c) (i) In which type of transformer are the number of secondary coils more?
          Why?

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....

....

....

....

....

(ii) Write *one* function of each of the following: **[2]**

      1. Armature in an A.C generator

....

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      2. Brushes

....

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Question 7

(a) (i) Define the term calorie.   **[1]**

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(ii)   Explain how crops are saved from the ill effects of frost.   **[1]**

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(iii)   Give *two* uses of cathode rays.   **[2]**

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(b)   (i)   A thorium isotope $^{232}_{90}\text{Th}$ first emits a β-particle and then an α-particle.

The resulting nucleus can be represented by $^{P}_{Q}\text{Ac}$. What are the values

of P and Q in terms of atomic number and mass number?   **[2]**

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(ii)   Differentiate between α and γ rays in terms of their penetrating power.

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(iii)   Explain why beta (β) particles are deflected more by electric and magnetic

         fields than alpha (α) particles.   **[1]**

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(c)   Ice at -10ºC is heated and completely changed to vapour. Draw a graph

        between time and temperature showing change of states of ice while heating and

        label the following correctly: **[2]**

        1. latent heat of fusion

        2. latent heat of vapourisation

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for Rough Work