Alternative No:

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

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 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 simple machines given below are examples of Class II levers **EXCEPT**

A wheel barrow.
B bottle opener.
C nut cracker.
D table knife.

Answer:……

(ii) A force 'F' acting on a mass 'm' causes it to move with acceleration 'a'. Which formula gives the correct relationship between 'F', 'm' and 'a'?

A $F = \frac{m}{a}$.

B $F = \frac{a}{m}$.

C $m = \frac{F}{a}$.

D $a = Fm$.

Answer:……

(iii) In which of the following, work is being done?

A A coolie carrying a box on his head and moving on a frictionless horizontal surface.
B A coolie standing with a load of 20 kg on his head.
C A coolie moving over a complete circular path.
D A coolie climbing up a staircase.

Answer:…….

(iv) Which of the following changes will **NOT** cause a block of wood to sink if it is imm in a liquid?

A If the volume of the liquid is increased.
B If the density of the liquid is increased.
C If the volume of wood is increased.
D If the value of 'g' is increased.

Answer:……

(v) In order for total internal reflection to occur

A light must travel from a denser medium to a rarer medium.
B light must travel from a rarer medium to a denser medium.
C the angle of incidence must be less than the critical angle.
D the angle of incidence must be equal to the critical angle.

Answer:……

(vi) The image formed by a convex lens when the object is placed between the optical centre and focal point F_1 is

A the same size as the object.
B the virtual image.
C the real image.
D diminished.

Answer:……

(vii) A sudden fall in the barometric height indicates

A possibilities of rain.
B coming of storm.
C cloudy weather.
D a fair weather.

Answer:……

(viii) A shutter is used for

A controlling the amount of light reaching the film.
B controlling the entry of dust particles.
C controlling exposure time.
D obtaining a sharp image.

Answer:……

(ix) When white light is passed through a cyan filter and a yellow filter, the colour obtained is

A red.
B blue.
C green.
D black.

Answer:……

(x) If Dema hears an echo after 2 seconds, the distance between the obstacle and Dema is (Speed of sound in air is 330 ms^{-1})

A 660 m.
B 330m.
C 165m
D 100 m.

Answer:……

(xi) The SI unit of current is

A volt.
B ohm.
C ampere.
D coulomb.

Answer:……

(xii) Read the following statements.

I. Wires are corrosive.
II. Wires are non-corrosive.
III. Wires have low resistance.
IV. Wires have high resistance.

Which combination of the statements given above is the characteristics of a high tension wire?

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

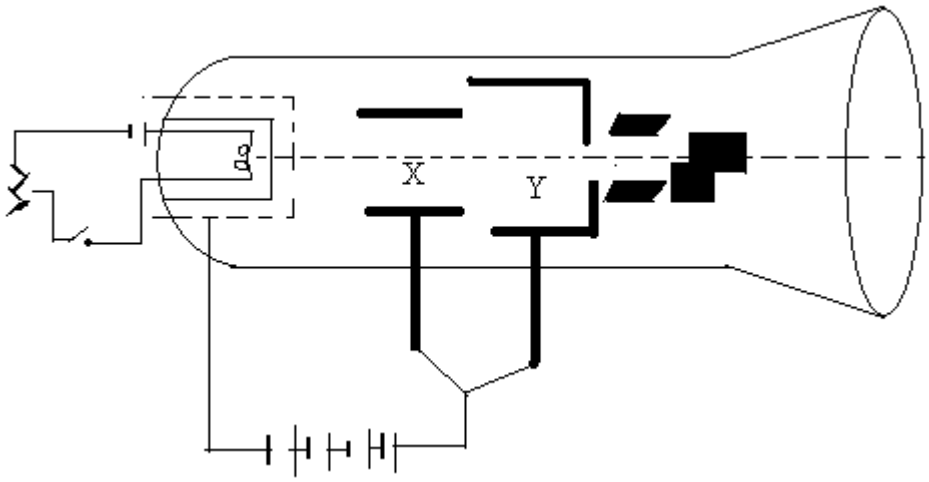
Answer:……

(xiii) The following statements are the characteristics of a transformer used before electric distributed to the consumer **EXCEPT**

A secondary coil has large number of turns.
B output voltage is less than input voltage.
C primary coil has large number of turns.
D wire used in primary coil is thin.

Answer:……

(xiv) The function of X and Y in the diagram given below is to



A alter the brightness of the spot on the screen.
B accelerate and focus the electrons into a beam.
C vary the number of electrons passing through it.
D deflect the beam up and down in a vertical plane.

Answer:……

(xv) To convert 10 g of ice at 0^oC to water at 0^oC, the amount of heat absorbed is (Specific latent heat of ice = $336Jg^{-1}$)

A 33600 J.
B 3360 J.
C 336 J.
D 33.6 J.

Answer:……...

(b) Fill in the blanks by writing suitable words.

(i) While ascending uphill the small wheel of a gear becomes the ……..gear.

(ii) A barometer is used to measure ……..

(iii) A photographic camera is used to record a ……..image.

(iv) The vibration produced in the sound boxes of a stringed instrument is an example of …….. vibration.

(v) The equivalent resistance of 2Ω and 4Ω when connected in parallel is ……..

(c) 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. **[5]**

Column A	**Column B**
1. Unit of energy	(a) magenta
2. Red + Blue	(b) watt
3. 15,000 Hz	(c) ultrasonic range
4. 2268 J	(d) joule
5. Treatment of patients	(e) cyan
	(f) audible range
	(g) latent heat of steam
	(h) γ- rays
	(i) specific heat capacity of steam
	(j) β- rays

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(d) Correct and rewrite the following statements. **[5]**

(i) A hydrometer is used to measure the purity of milk.

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(ii) Diverging lens can be used as a magnifying glass.

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(iii) Water is used as a coolant in vehicles due to its low specific heat capacity.

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(iv) β- particles are emitted in the following reaction: ${}^{220}_{86}X \rightarrow {}^{216}_{84}Y$.

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(v) α- particles cause maximum biological damage.

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(e) Answer the following questions.

(i) A stone will weigh less in water or in air? Why? **[1]**

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(ii) Prepare a graph to show the dependence of the angle of deviation on the angle of incidence.**[1]**

(iii) How is it possible for a blind man to detect the filling of a pitcher under a tap by listening to its sound?

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(iv) Distinguish between a real image and a virtual image in the table given below. **[1]**

Real image	**Virtual image**

(v) Why is it advantageous to connect resistors in parallel? **[2]**

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(vi) Which of the cables - rated 2A and 10A will be thicker? Justify your answer. **[2]**

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(vii) How will you increase the intensity of a magnetic field developed in a solenoid? **[1]**

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(viii) In summer after a rainfall, we usually feel uncomfortable. Why? **[1]**

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SECTION B (40 Marks)

Attempt any four questions

Question 2

(a) How is mass different from weight? Justify your answer with *two* reasons in the table given below. **[2]**

Mass	**Weight**

(b) State *one* effect that force can produce and give an example. **[1]**

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(c) Calculate the kinetic energy of a helicopter with a mass of 1200 kg flying horizontally at 360kmh^{-1}. **[3]**

(d) (i) Show with the help of a diagram, the formation of an image when the object is placed between infinity and optical centre in a diverging lens.

(ii) Write down the characteristics of the image formed in the above lens. **[2]**

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Question 3

(a) Why are the walls of a dam made thicker at the bottom? **[1]**

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(b) State Pascal's law. **[1]**

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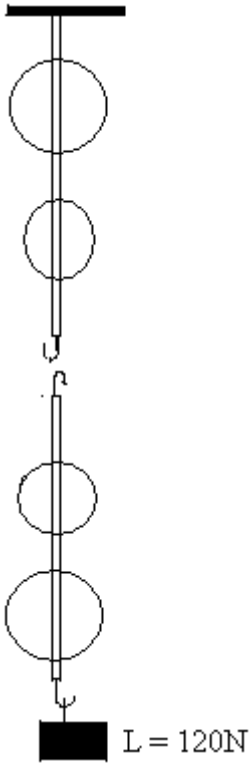
(c) The diagram below is to be used with the questions that follow:



(i) Draw a string around the pulleys showing the direction of tension in each strand in the diagram given above. **[1]**

(ii) What is the mechanical advantage of the system? **[1]**

(iii) How much effort is required to lift the load?

(d) The density of mercury is 13600 kg m^{-3}. What is its relative density in **[2]**

1. C.G.S unit?
2. S.I unit?

(e) Write *three* differences between a camera and a human eye in the table given below. **[3]**

Camera	**Human eye**

Question 4

(a) When a body floats, will the weight be more, less or equal to the buoyant force? Justify.

(b) A stick when dipped in water appears to be short. Explain with the help of a diagram. **[3]**

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(c) Zangmo's family uses 2 bulbs of 100 W each for 5 hours, 3 tubes of 50 W each for 8 hours and 5 fans of 120 W each for 10 hours daily. If the cost of 1 unit is Nu.2, how much does she pay BPC in a month? **[4]**

(d) Why is a switch always connected to the live wire? **[1]**

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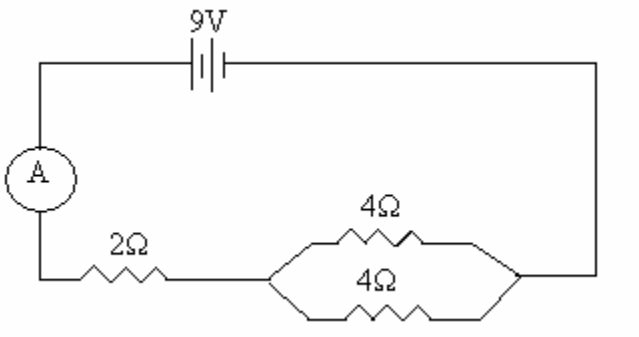
Question 5

(a) Prove with the help of a diagram that a prism does not produce any colour by itself. **[3]**

(b) State *two* differences between noise and music in the table given below.

Noise	**Music**

(c) The diagram below is to be used with the questions that follow.



(i) Calculate the total resistance connected in parallel. **[1]**

(ii) Calculate the total resistance of the circuit. **[1]**

(iii) What is the reading of the ammeter? **[2]**

(iv) Calculate the voltage across 2Ω resistor.

Question 6

(a) (i) What is meant by resonance? **[1]**

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(ii) State the conditions under which resonance occurs**.** **[1]**

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(iii) Give *four* examples of phenomena based on resonance. **[2]**

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(b) What energy conversion takes place in the following devices?

1. Dynamo
2. D.C motor

1.……

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2.……

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(c) Is $^{226}_{88}Ra$ a radioactive substance? Support your answer. **[2]**

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(d) Give *two* application of high specific latent heat of steam. **[2]**

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Question 7

(a) (i) Define thermionic emission. **[1]**

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(ii) Write *two* factors that affect the rate of emission. **[1]**

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(iii) How will you choose a metal which is a good electron emitter?

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(b) Pema wanted to take bath. He heated 5g of water to 45^{o}C. How much cold water at 5^{o}C will he need to make the final temperature of the mixture to 15^{o}C? **[3]**

(c) When water in lakes and ponds starts freezing we feel warm. Why? **[1]**

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(d) Write *four* uses of an electromagnet. **[2]**

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for Rough Work