Alternative No:

Index No: 0 1 0 1 1

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) One joule of work is said to be done when a force of

A 1N displaces a body by 1m.
B 1N displaces a body by 1cm.
C 1 dyne displaces a body by 1m.
D 1 dyne displaces a body by 1cm.

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 effort in a convenient direction.

Answer:……

(iii) At high altitude nose bleeding may occur because the

A blood pressure decreases.
B atmospheric pressure decreases.
C acceleration due to gravity decreases.
D oxygen content of the atmosphere decreases.

Answer:…….

(iv) When a cork is held under water, the buoyant force on it will be

A equal to the weight of the cork.
B less than the weight of the cork.
C more than the weight of the cork.
D zero.

Answer:……

(v) A person's leg appears to be short when standing in a tank of water due to

A total internal refraction.
B reflection of light.
C refraction of light.
D looming of water.

Answer:……

(vi) The image formed by a concave lens is virtual,

A inverted and diminished.
B inverted and magnified.
C erect and diminished.
D erect and magnified.

Answer:……

(vii) A piece of red cloth when viewed through a blue filter will appear

A red.
B black.
C white.
D yellow.

Answer:……

(viii) When a tuning fork is struck against a rubber pad, it executes

A resonance.
B free vibration.
C forced vibration.
D damped vibration.

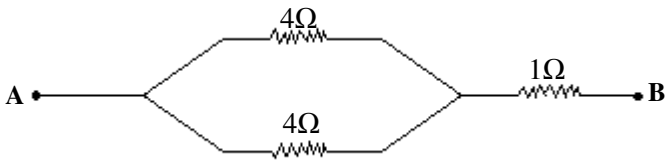
Answer:……

(ix) When the main switch 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:……

(x) The equivalent resistance between point A and B in the diagram given below is



A 9 Ω.
B 6 Ω.
C 5 Ω.
D 3 Ω.

Answer:……

(xi) The core of a transformer is laminated to

A avoid self induction.
B increase efficiency.
C avoid eddy current.
D decrease friction.

Answer:……

(xii) It feels colder after a snow fall than during and before the snowfall due to

A high latent heat of fusion of ice.
B low latent heat of fusion of ice.
C high specific heat capacity of ice.
D low specific heat capacity of ice.

Answer:……

(xiii) The correct decreasing penetrating power of alpha, beta and gamma radiations is

A gamma, beta and alpha.
B alpha, beta and gamma.
C beta, alpha and gamma.
D gamma, alpha and beta.

Answer:……

(xiv) All the following are the advantages of the ring-system of wiring **EXCEPT**

A the cost of wiring is low.
B less numbers of bulbs are used.
C every appliance has its own fuse.
D the plugs and sockets used are of the same size.

Answer:……

(xv) In beta emission, the electron ejected from a radio-active substance comes from the

A outermost orbit of the atom.
B innermost orbit of the atom.
C free electron of the atom.
D nucleus of the atom.

Answer:……...

(b) Fill in the blanks by writing suitable word/s. **[5]**

(i) In a class II lever, the mechanical advantage is greater than …….

(ii) A ……. is used to test the purity of milk.

(iii) The rear view mirror of a motorcycle starts vibrating at a particular speed due to ……..

(iv) The temperature of land rises quickly as compared to the sea because of ……. specific heat capacity.

(v) ……. are used for checking the wave forms of electrical signals.

(c) 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. X-rays	(a) Ohm
2. Noise	(b) specific heat capacity of water
3. Resistance	(c) emit protons
4. 4200 $Jkg^{-1}C^{-1}$	(d) treatment of cancer
5. Electron gun	(e) sudden change in amplitude
	(f) latent heat of vaporisation
	(g) volt
	(h) emit electrons
	(i) same amplitude

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

(i) In Newton's Third Law of Motion, the action and reaction force must act on the same body.

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(ii) In a loud speaker, electrical energy is converted into mechanical energy.

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(iii) The resistance of a conductor decreases with the rise in temperature.

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(iv) A fuse has high resistance and high melting point.

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(v) An electromagnet is a permanent magnet.

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(e) Answer the following questions.

(i) Write **ONE** difference between a simple barometer and an aneroid barometer in the table given below. **[1]**

Simple barometer	**Aneroid barometer**

(ii) If a stone and wood of the same mass is immersed in water, which one will experience more upthrust? Why? **[1]**

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(iii) How is the angle of deviation dependent on the angle of prism? **[1]**

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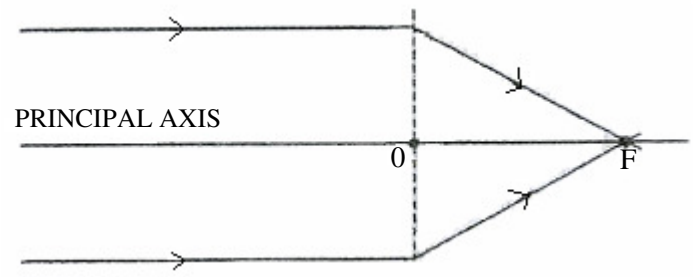
(iv) The diagram given below shows the rays of light travelling through a lens.



1. Identify the type of lens used in the above diagram. **[1]**

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2. How will the ray travel if it passes through the optical centre? **[1]**

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(v) How does the human eye differ from a photographic camera in terms of image formation and focussing. Write the differences in the table given below.

	Photographic camera	**Human eye**
Image formation		
Focussing		

(vi) How is it possible to recognize a person by hearing his voice without seeing him? **[1]**

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(vii) Which quantity should be constant for a conductor to obey Ohm's law? **[1]**

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(viii) What do you understand by the statement 'specific latent heat of vaporization of steam is 2268000 Jkg^{-1}'? **[1]**

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SECTION B (40 Marks)

Attempt any four questions

Question 2

(a) (i) Compare any **TWO** properties of mass and weight in the table given below. **[2]**

Mass	**Weight**

(ii) Name the classes of lever to which the following belong. **[1]**

1. handle of water pump: ……..
2. lock and key: ……..

(iii) How does the density of a body determine whether it will float or sink in water? **[1]**

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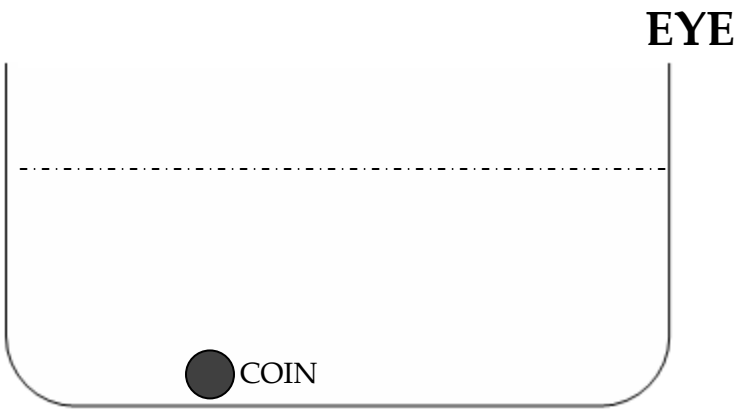
(b) (i) A student observes a coin in water from a position indicated in the diagram given below. Complete the ray diagram.



(ii) Name the phenomenon in the above observation. **[1]**

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(iii) How will the ray travel, if the angle of incident of one of the ray becomes greater than the critical angle? **[1]**

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(c) (i) What is resistance? **[1]**

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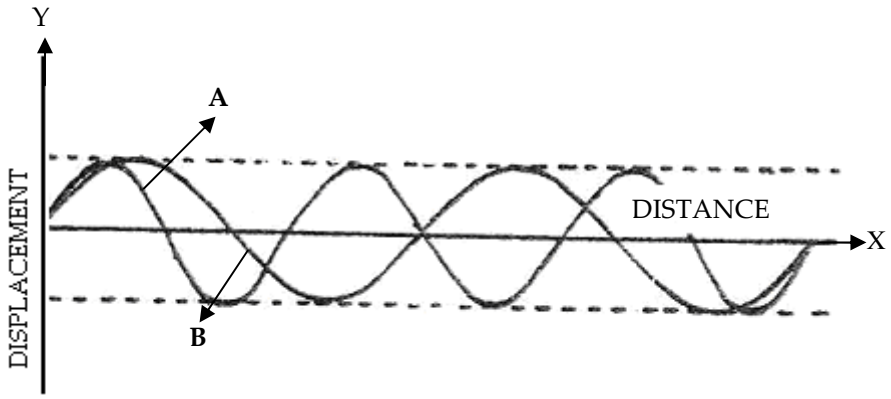
(ii) The diagram given below shows a wave form. Study the diagram and answe the questions that follow.



Which sound wave will produce **[1]**

1. shrill or sharp sound?

……

2. dull or flat sound?

……

(iii) How did you identify the shrill or sharp sound? **[1]**

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Question 3

(a) (i) Which class of lever has mechanical advantage always greater than one? Explain. **[2]**

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(ii) Explain why tea gets cooler when sugar is added to it? **[1]**

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(b) (i) Define the S.I unit of force.

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(ii) Find the work done in lifting a box of mass 5 kg to a height of 8m.
(Take g = 10m/s^2) **[2]**

(iii) Name the region beyond the red end and the violet end of the spectrum. **[1]**

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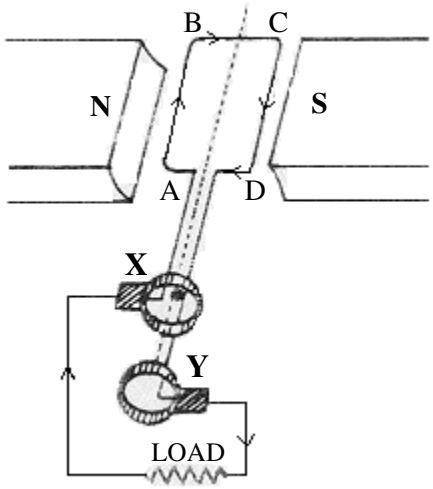
(c) Study the diagram and answer the questions that follow.



(i) Name the parts X and Y. **[1]**

X……

Y……

(ii) How do the positions of the coil relative to the field change when the emf has a maximum and minimum value?

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(iii) In which directions do the arms of the coil rotate? **[1]**

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Question 4

(a) (i) Explain the application of Pascal's Law in a hydraulic press. **[2]**

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(ii) A sound made in front of a tall building is heard again. Name and briefly explain the phenomenon. **[2]**

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(b) An imaginary radioactive element decays to form X_1 and X_2 by ejecting a beta particle followed by an alpha particle.

(i) Represent the various nuclear changes in the form of an equation. **[2]**

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(ii) What will be the mass number and atomic number of X_3, if X_2 undergoes gamma emission? **[1]**

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(c) (i) 20g of water at 80°C is poured into 60g of cold water at 10°C. Calculate the final temperature of the mixture.

(ii) State the S.I unit of specific heat capacity. **[1]**

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Question 5

(a) (i) Draw a diagram to show the formation of an image when the object is placed between the optical centre and focal point F_1 of the convex lens. **[2]**

(ii) State the characteristics of the image formed in the above diagram. **[1]**

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(iii) What will happen to the image formed by a lens, if the object is placed on the $2F_1$ position? **[1]**

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(b) A resistor of 2Ω is connected in series with another resistor of 3Ω. A current 4A is flowing through the circuit.

(i) Draw a diagram to show this arrangement. **[1]**

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

(iii) Calculate the potential applied in the circuit. **[1]**

(iv) Calculate the potential applied across each resistor.

(c) (i) Give **TWO** conditions when the work done is zero. **[1]**

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(ii) Name the lens used in a photographic camera. **[1]**

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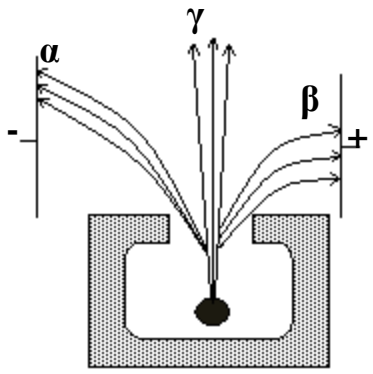
Question 6

(a) A man uses a 100V bulb which draws a current of 5A and a 100W bulb for 10 hours daily. For which bulb does he pay more at the end of a month, if the energy cost is Nu. 0.90 per unit? **[2]**

(b) Study the diagram given below and answer the questions that follow.



(i) From the diagram, how can the radiations alpha, beta and gamma be identified? **[1]**

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(ii) Which of the two radiations, alpha or beta causes more biological damage? **[½]**

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(iii) How will the deflection of radiations be affected, if the terminals are interchanged? **[1½]**

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(c) (i) State Archimedes' principle. **[1]**

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(ii) What are the factors on which a camera depends to get a good photograph?

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(iii) Why does a red flower appear black when it is viewed in green light? **[2]**

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Question 7

(a) (i) Give a reason for the following statement 'The surrounding becomes cool when water in a lake starts evaporating'. **[2]**

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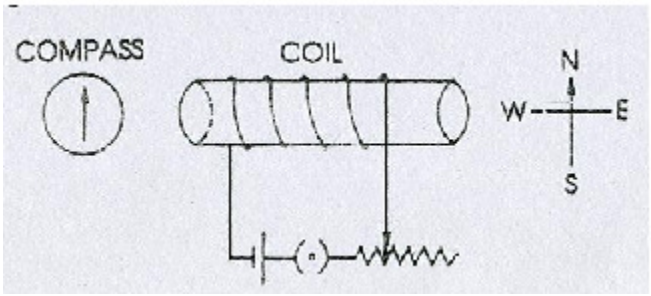
(ii) The diagram given below shows the magnetic compass placed near a magnetic field. In which direction will the compass needle point? **[1]**



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(b) (i) What information does the following statement convey 'An electric bulb is r
250W and 230V'?

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(ii) What do you mean by the term 'earthing'? **[1]**

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(c) (i) An inflated gas balloon is placed in a jar connected to an evacuating pump. What will you observe if the air is pumped out? Explain your observation. **[2]**

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(ii) When a person fires a cracker 132.8m from a high building, an echo is heard after 0.8s. Calculate the speed of sound. **[2]**