

Alternative No:

Index No:

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** 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 →																	

This booklet contains 20 pages.

SECTION A (40 Marks)

Compulsory: To be attempted by all candidates.

Question 1

- (a) (i) A body of mass 5 kg falls from a height of 10 m. How much energy does it possess at any instant? (Take $g = 9.8\text{m/sec}^2$) [2]

- (ii) What is the S.I unit of work? [1]

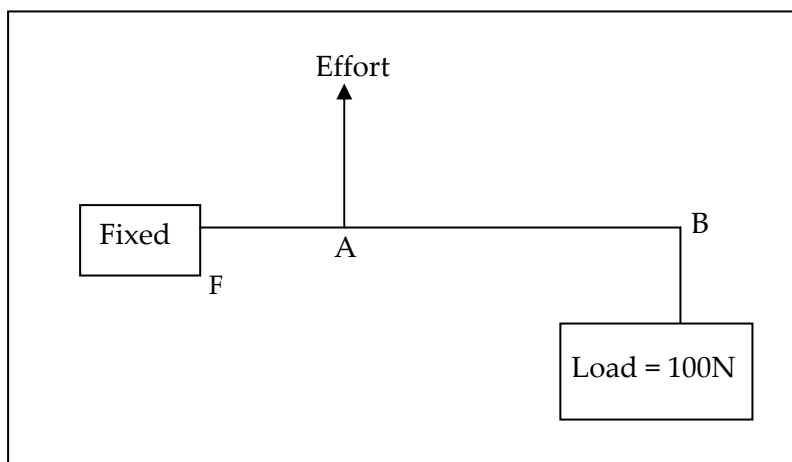
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- (iii) When a body moves in a circular path, how much work does it do? [1]

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- (b) Study the diagram of the use of lever and answer the questions that follow.



- (i) Give an example of this class of lever. [1]

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(ii) If $FA = 20$ cm, $AB = 400$ cm, calculate the minimum effort required to lift the load.

(iii) A man first swims in sea water and then in river water. Where does he find it easier to swim and why?

[1]

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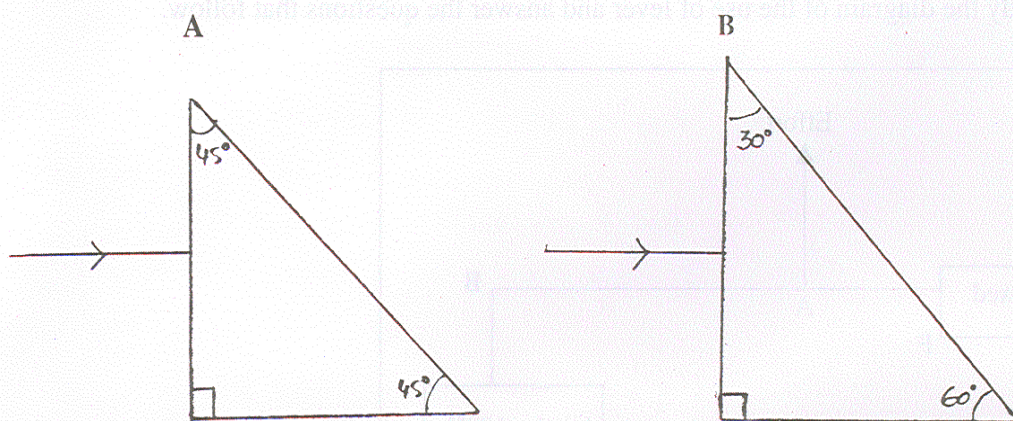
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(c) The diagrams given below show two right angled glass prisms A and B. Study the diagrams and answer the following questions.

(i) On the diagrams, complete the path of each ray to show how it enters and emerges out of the prisms A and B. (Critical angle for glass is 42°)

[2]



(ii) In a glass prism, angle of deviation is the angle between the ray and theray.

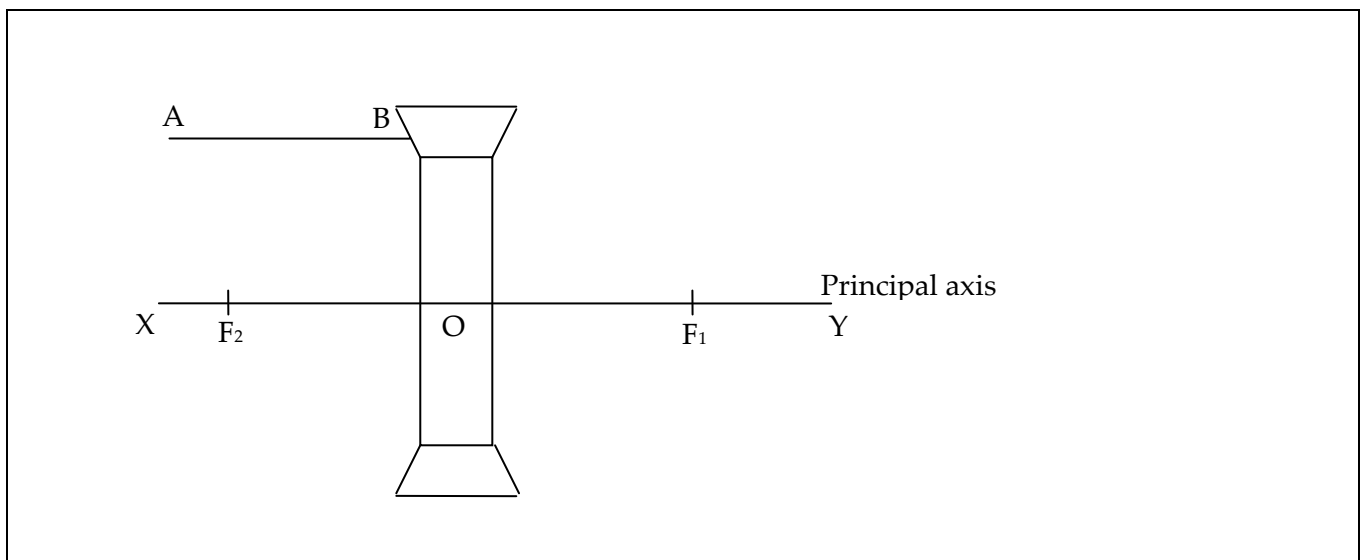
[2]

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

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(ii) The diagram below shows a lens as a combination of a glass block and two prisms. Study the diagram and answer the following questions.

1. On the diagram complete the path of the incident ray AB after passing through the lens. [1]



2. Name the lens formed by the combination. [1]

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(e) (i) In the following types of radiations, X-rays, microwaves, γ -rays and infra-red radiations which

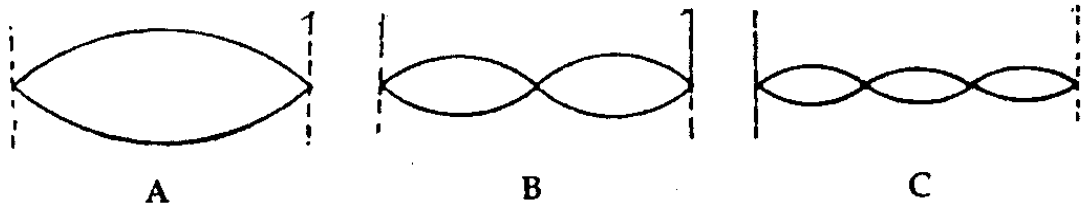
1. has the longest wave length? [1]

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2. is used for night photography? [1]

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(ii) The diagram given below shows three different modes of vibration of a string



1. Which figure represents vibration of the largest amplitude? [1]

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2. What is the ratio of frequency between A and B? [1]

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(f) (i) An echo-sounder in a trawler receives an echo from a shoal of fish 0.4 sec after it was sent. If the velocity of sound in sea water is 1400 m/sec, how deep is the shoal? [2]

(ii) What is an ohmic conductor? Give an example. [2]

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(g) (i) An electric bulb is rated at 220 V, 100 W, calculate the current that can pass through its filament.

(ii) In an A.C generator,

1. what would be the effect on e.m.f. if the strength of magnetic field is increased? [1]

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2. state the energy conversion taking place. [1]

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(h) (i) A fuse is connected in(parallel/series) to the
..... (earth/live/neutral) wire. [2]

(ii) Why is the earth pin longer and thicker than the other two in a three pin plug top? [2]

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(i) (i) Define specific latent heat of fusion of a substance. Give its S.I unit.

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(ii) Why are wine and juice bottles placed under water in cold countries? [2]

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(j) (i) State **TWO** properties of alpha particles. [2]

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(ii) Which type of radioactive radiation [2]

1. causes most biological damage?

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2. has negative charge?

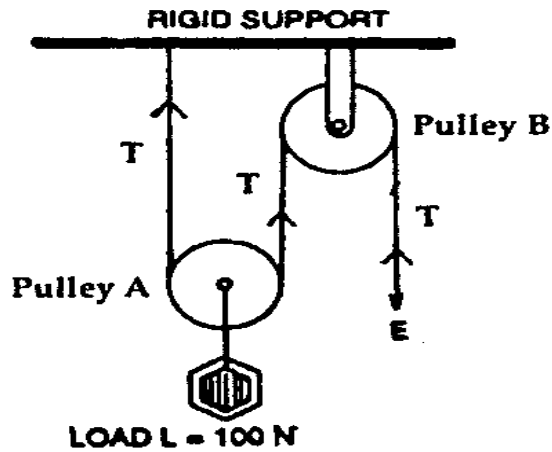
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SECTION B (40 Marks)

Attempt any *four* questions.

Question 2

- (a) The figure given below shows a pulley arrangement. Study the figure and answer the questions that follow.



- (i) State the purpose of pulley B. [1]

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- (ii) What is the velocity ratio of the above arrangement? [1]

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- (iii) Calculate the effort (E) required to lift the load. [1]

- (iv) Find the mechanical advantage (MA) of the above arrangement. [1]

(b) (i) Name the instrument which is used to directly measure Relative Density of liquids.

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(ii) State the principle on which this instrument works. [1]

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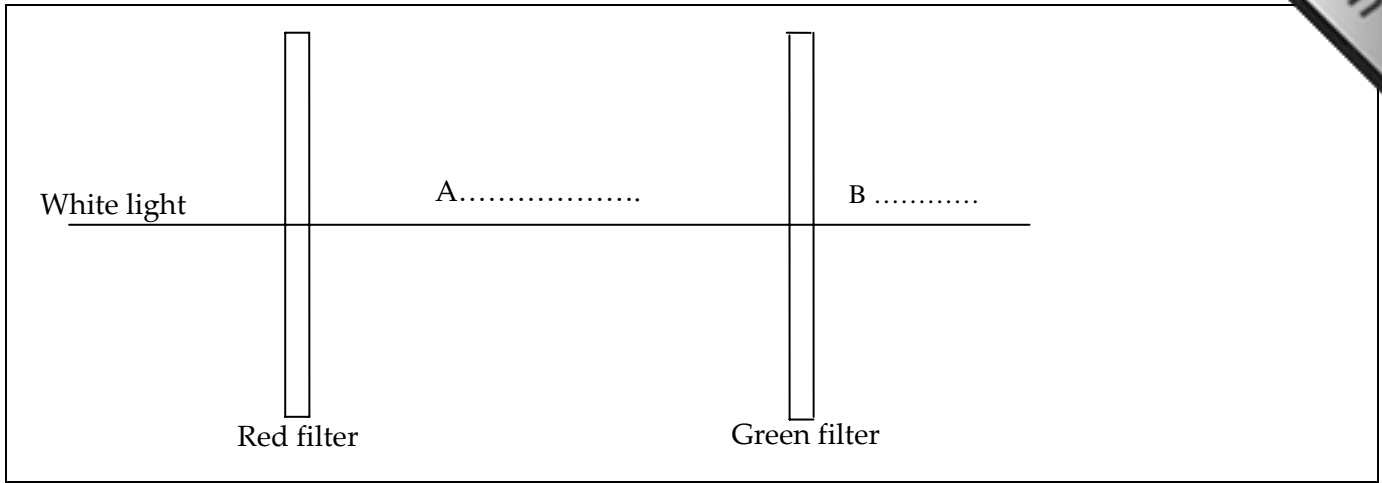
(c) (i) Draw a curve showing the variation of angle of deviation with the angle of incidence at a prism surface. [2]

(ii) Calculate the speed of light in water. [2]

(Speed of light in vacuum = 3×10^8 m/sec and Refractive index of water = $\frac{4}{3}$)

Question 4

(a) (i) In the following diagram, label A and B.



(ii) What do you mean by complementary colours? Give an example of a pair of complementary colours. [2]

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(b) (i) Why is a bell provided with a big outer case? [2]

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(ii) The same musical note when played on a piano and when played on a flute sounds different. Give a reason.

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(iii) 1. Define the term 'echo'. [1]

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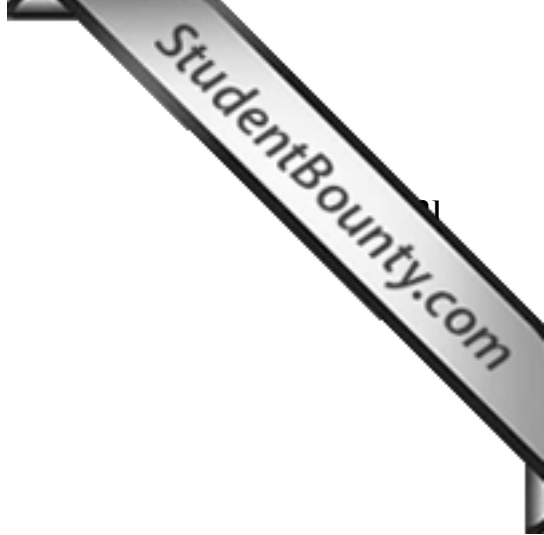
2. State the minimum distance required between the source of sound and the obstacle to hear an echo. [1]

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Question 5

(a) Two resistors of resistance 3Ω and 2Ω in parallel are connected to a cell of e.m.f. 1.5V and internal resistance 0.3Ω .

(i) Draw a labelled circuit diagram to show the above arrangement. [2]



(ii) Calculate the total resistance of the circuit.

(iii) Calculate the current drawn from the cell.

[1]

(b) Write an expression for the resistance (R) of a conducting wire in terms of its

[2]

(i) length (l).

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(ii) area of cross section (A).

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(c) (i) Name a device used to convert 200V a.c. to 15 volt a.c.

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(ii) Name the principle on which the above device works.

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(iii) Mention **ONE** practical use of the above device.

[1]

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Question 6

(a) Calculate the cost of running a 1000W heater for 2 hours daily for 30 days at the rate of Nu 0.90 per unit.

[2]

(b) *'Pieces of ice at 0°C are more effective in cooling a drink than water at 0°C'.*

Explain this statement.

[2]

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(c) Define the term 'Specific heat capacity of a substance' and state its S.I unit.

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(d) A piece of brass of mass 2 kg at 100°C is dropped into 4 kg of water at 20°C.
The final temperature of the mixture is 40°C. Calculate the specific heat capacity of
brass. (Specific heat capacity of water = 4200 J/kg°C)

[4]

Question 7

(a) Draw a labelled diagram of a cathode ray tube.

(b) Give **TWO** characteristics of a metal that can be used as a thermionic or electron emitter. [1]

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(c) In the nuclear reaction given below, a nucleus 'X' changes to another nucleus 'Y'. ${}_{88}\text{X}^{226} \rightarrow \text{Y} + \alpha$ - particle

(i) What are the atomic and mass numbers of 'Y'? [2]

Atomic number	
Mass number	

(ii) Name the gas formed when α - particle acquires two electrons. [1]

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(iii) What is the effect on the motion of α - particle when it passes through a region containing an electric field? [1]

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(d) State **TWO** scientific uses of radioactivity. [2]

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