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Index No:

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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 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 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) Newton is the SI unit of

- A mass.
- B force.
- C work.
- D energy.

Answer:.....

(ii) Which of the following combination of statements best describes the function of a machine?

- I. It is used to multiply work.
- II. It is used to multiply force.
- III. It is used to change the direction.
- IV. It is used to decrease the speed.

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

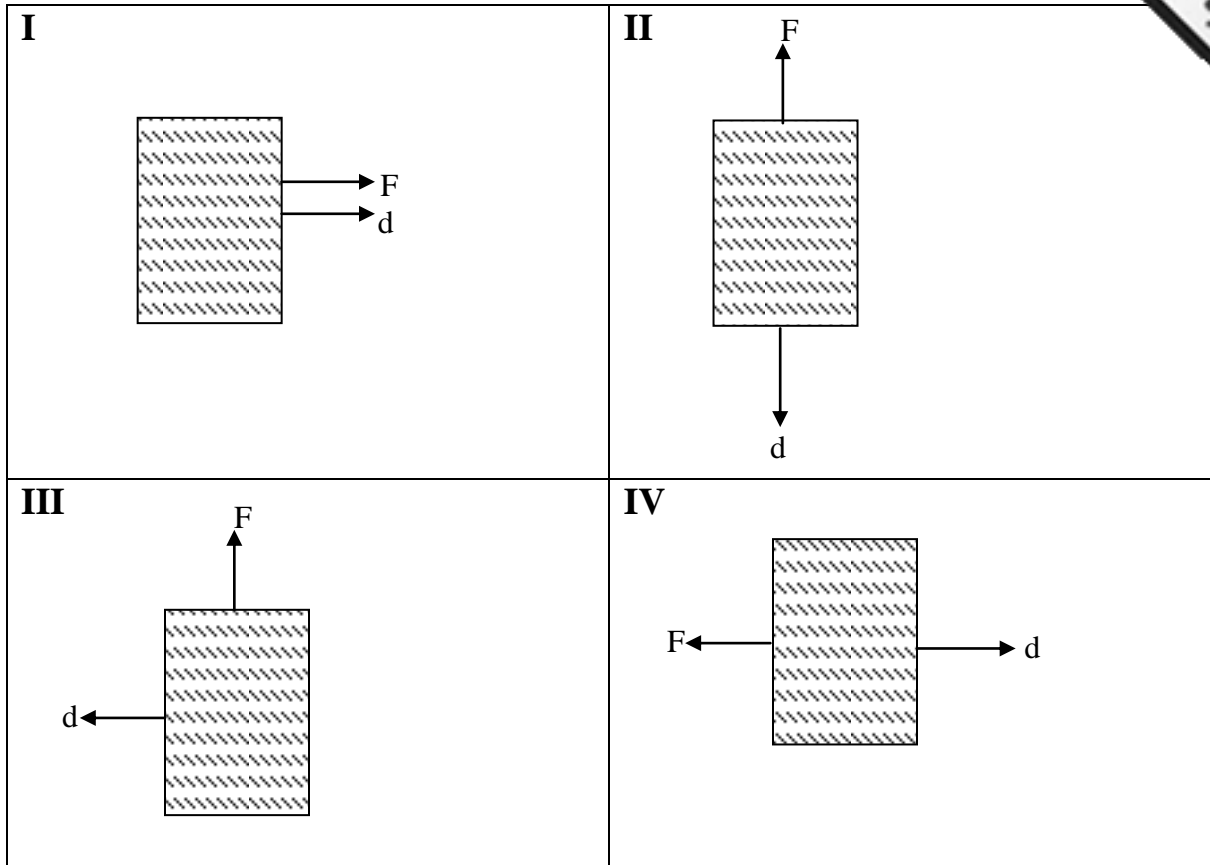
Answer:.....

(iii) The walls of a dam are made thicker at the bottom because pressure

- A increases as depth increases.
- B increases as density increases.
- C is same in all directions about a point in a liquid.
- D is same at all points in a horizontal plane in a liquid.

Answer:.....

(iv) In which of the following diagrams is the work done positive?



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

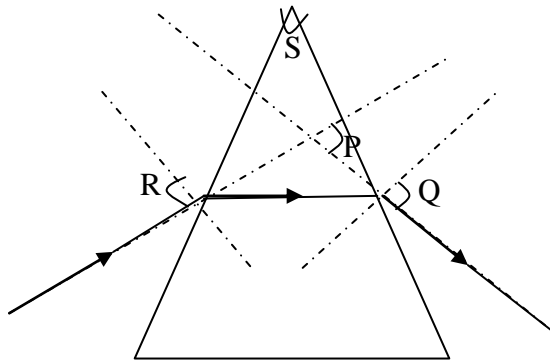
Answer:.....

(v) The density of water at 4°C is

- A 100 kgm⁻³.
- B 100 gcm⁻³.
- C 1 kgm⁻³.
- D 1 gcm⁻³.

Answer:.....

(vi) In the diagram given below, the angle of deviation is



- A P.
- B Q.
- C R.
- D S.

Answer:.....

(vii) 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:.....

(viii) The function of the shutter is to

- A obtain a sharp image.
- B focus a distant object.
- C prevent dust entering the film.
- D control the exposure time of the film.

Answer:.....

(ix) The secondary colour formed by mixing green and blue is

- A magenta.
- B yellow.
- C white.
- D cyan.

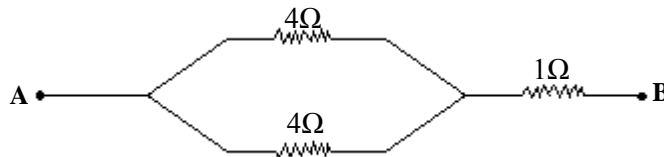
Answer:.....

(x) A man blows a whistle and hears its echo after 6s. Given that the speed of sound = 340 ms^{-1} , the distance between the man and the obstacle is

- A 2040 m.
- B 1020 m.
- C 980 m.
- D 340 m.

Answer:.....

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



- A 9Ω .
- B 6Ω .
- C 5Ω .
- D 3Ω .

Answer:.....

(xii) High tension wires are used for high voltage and heavy current because these wires have

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

Answer:.....

(xiii) An electrical device which transfers a.c power from primary winding to the secondary winding at higher or lower voltage is a

- A D.C motor.
- B transformer.
- C galvanometer.
- D A.C generator.

Answer:.....

(xiv) All the statements given below are true **EXCEPT**

- A if the atmospheric pressure falls suddenly, it indicates the arrival of storm.
- B if the atmospheric pressure falls gradually, it indicates fair weather.
- C at higher altitudes, nose bleeding may occur due to reduced air pressure.
- D at lower altitudes, ears get blocked due to increased air pressure.

Answer:.....

(xv) 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:.....

(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. Permanent image	(a) $J\ kg^{-1}$
2. Less output current	(b) camera
3. Latent heat	(c) electron gun
4. Electron emission	(d) convex lens
5. Converging light	(e) human eye
	(f) step-up transformer
	(g) $J^{\circ}C^{-1}$
	(h) deflecting system
	(i) step-down transformer
	(j) concave lens

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(c) *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.

(d) *Rewrite the following statements by replacing the words in BOLD only.* [5]

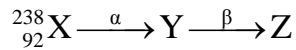
- (i) In loud speakers, **heat** energy is converted to sound energy.
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- (ii) A red pair of jeans when viewed through a blue filter will appear **red**.
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- (iii) In a household circuitry, the appliances are connected in **series**.
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- (iv) In third class levers, mechanical advantage is always less than 1 because load arm is always **shorter** than the effort arm.
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(v) If the refractive index of glass with respect to air is $\frac{3}{2}$, then the refractive index of air with respect to glass is **1.5**.

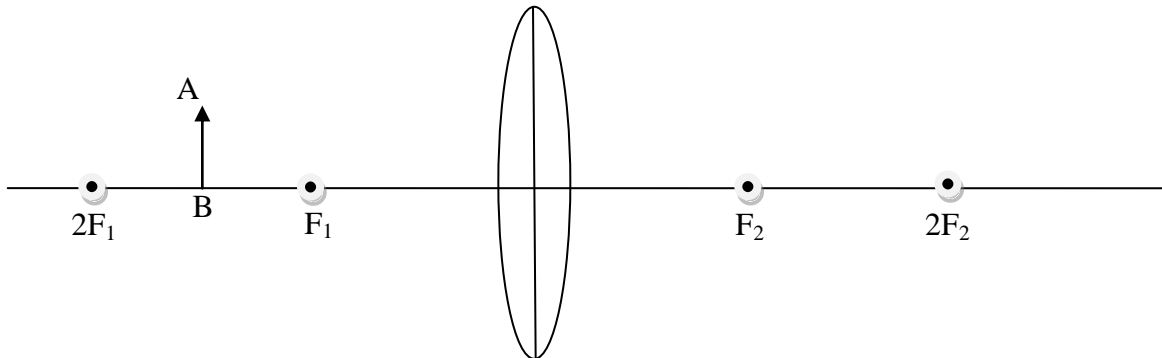
(e) *Answer the following questions.*

(i) Why will a body weigh less in air than in a vacuum? [1]

(ii) Write the mass number and atomic number of Y and Z in the nuclear reaction given below. [2]



(iii) Complete the ray diagram given below. [1]



(iv) Write any *two* differences between noise and musical sound in the table given below.

Musical sound	Noise

(v) How does the resistance of a wire depend on its thickness?

Give a reason to support your answer.

[2]

(vi) Calculate the amount of heat required to raise the temperature of 3 kg of

water from 10°C to 20°C. (Specific heat capacity of water is 4200 Jkg⁻¹°C⁻¹.)

[2]

SECTION B (40 Marks)
Attempt any four questions

Question 2

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

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(ii) A man weighs 200N on the moon. What would be his approximate weight on the earth? Give a reason to support your answer. [2]

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(b) (i) Write the relationship among power, work and time. [1]

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(ii) In which case is the work done zero, a boy standing with a load of 10 kg on his head or a boy climbing a ladder? Justify your answer. [2]

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(c) (i) A block and tackle system has 4 pulleys. If an effort of 1000N is required to raise a load of 'x', calculate:

1. the mechanical advantage. [1]

2. load 'x'. [1]

(ii) It is inconvenient to apply the effort in a single movable pulley.

Why is it then still used? [1]

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(iii) Name *two* appliances of Pascal's law. [1]

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Question 3

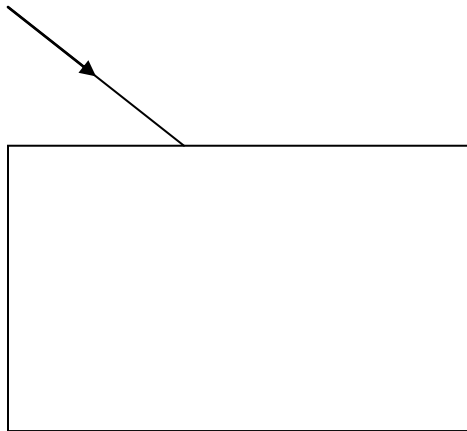
(a) (i) Why are the cabins of passenger aircrafts pressurized? [1]

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(ii) What do you need to make a body float? Why?

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(b) (i) 1. Complete the ray diagram given below. Show the angle of incidence, angle of refraction and angle of emergence. [2]



2. How is the angle of incidence related to the angle of emergence?

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(ii) What causes refraction of light? [1]

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- (c) (i) The density of silver is 10800 kgm^{-3} . What is the RD in:
1. CGS unit,
 2. SI unit?

[1/2]

- (ii) Draw a diagram to show how a converging lens can form an image of an object that is equal to the size of the object.

[2]

Question 4

- (a) (i) Name the part which is used to regulate the light in the:
1. human eye.
 2. camera.

[1]

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- (ii) Compare the photographic camera with the human eye in the table given below based on the:
1. method of focusing,
 2. control of the amount of light passing through the lens.

	Camera	Human eye
1. Focusing		
2. Control of the amount of light		

- (b) (i) When an object is placed at 10cm, the magnification produced by a convex lens is 4. Find the distance of the object. [2]

- (ii) Write *two* important applications of echoes. [2]

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(c) (i) Define filters.

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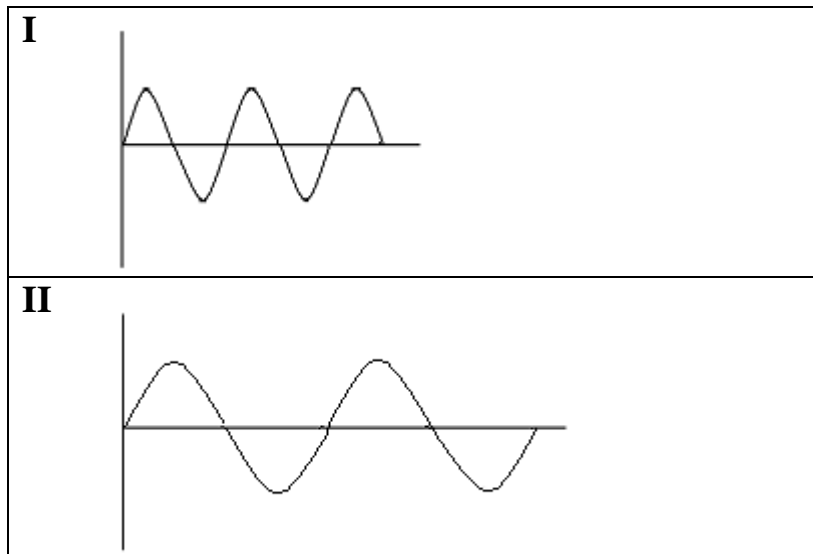
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(ii) State **one** use each of microwaves and X-rays in the table given below. [2]

Microwaves	X-rays

Question 5

(a) (i) The diagrams given below show sound waves.



Which diagram shows:

[2]

1. a high pitch sound,
2. a loud note?

Justify your answers.

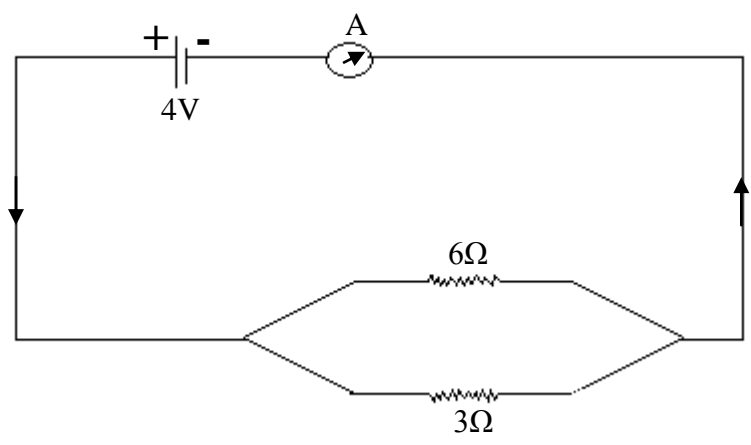
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(ii) Define forced vibrations. Give an example. [2]

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(b) (i) There are two resistors 6Ω and 3Ω joined together as shown in the diagram given below. The resistors are connected to an ammeter and to a cell of emf 6v.



Calculate:

- 1. its effective resistance, [1]
- 2. the current drawn from the cell. [1]

(ii) State Ohm's law and write its mathematical expression. [2]

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(iii) How will the resistance change, if a given wire is stretched to make its length three times? [1]

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(c) What is a switch? [1]

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Question 6

(a) (i) A curry cooker is rated 15kW, 220v. If it is connected to a 250 V mains, calculate:

- 1. the energy consumed in 10 hours, [1½]
- 2. the cost of energy consumed in 10 hours at the rate of Nu. 1.75 per unit. [½]

(ii) Why is the earth pin longer and thicker than the rest of the pins? [2]

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(b) (i) Name the principle on which a transformer works. [1]

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(ii) Name the device in which a piece of soft iron is placed inside a current carrying coil. State *one* use. [2]

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(iii) How can you increase the strength of an electromagnetic field?

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(c) Explain the following.

(i) Why is water used in hot water bottles for fomentation? [1]

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(ii) Why does it become very cold when snow starts melting? [1]

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Question 7

(a) (i) 2kg of water at 60°C is poured into a bucket containing 5kg of water at 20°C. Calculate the final temperature of the water neglecting the heat absorbed by the bucket. [3]

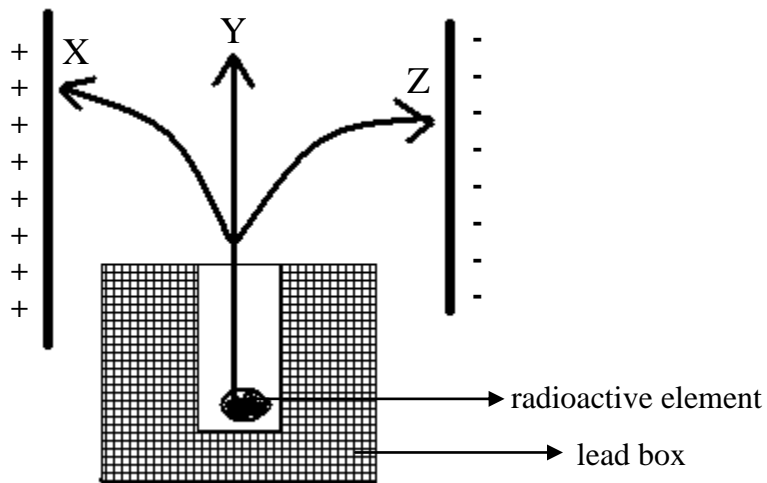
(ii) What material is used to make calorimeters? Why?

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(b) (i) What do you understand by thermionic emission? [1]

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



1. Label the radiations X, Y and Z. [1½]

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2. Compare their ionizing powers. [1½]

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(iii) Which of the above radiations labelled X, Y and Z will cause the maximum damage to the human body? Why?

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for Rough Work