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FOR ICSE CLASS 10 EXAM PREPARATION

ICSE Class 10 2027 Sample Paper · Physics

EXAM	YEAR	TYPE	SUBJECT
ICSE Class 10	2027	Sample Paper	Physics

ICSE 2027 EXAMINATION

SPECIMEN QUESTION PAPER

PHYSICS

(SCIENCE PAPER 1)

Maximum Marks: 80

Time allowed: Two hours

1. *Answers to this Paper must be written on the paper provided separately.*
2. *You will not be allowed to write during first **15** minutes.*
3. *This time is to be spent in reading the question paper.*
4. ***The time given at the head of this Paper is the time allowed for writing the answers.***

5. ***Section A** is compulsory. Attempt **any four** questions from **Section B**.*
6. *The intended marks for questions or parts of questions are given in brackets [ ].*

Instruction for the Supervising Examiner

Kindly read aloud the Instructions given above to all the candidates present in the Examination Hall.

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NOTE:

The Specimen Question Paper in the subject provides a realistic format of the Board Examination Question Paper and should be used as a practice tool. The questions for the Board Examination can be set from any part of the syllabus. However, the format of the Board Examination Question Paper will remain the same as that of the Specimen Question Paper.

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SECTION A (40 Marks)

*(Attempt **all** questions from this Section.)*

Question 1

Choose the correct answers to the questions from the given options. [15]

(Do not copy the question, write the correct answers only.)

(i) A heavy object and a light object are placed on a seesaw. Which arrangement produces the maximum turning effect about the pivot?

(a) Both objects near the pivot on opposite sides.

(b) Heavy object close to the pivot; light object at the far end on the opposite side.

(c) Light object close to the pivot; heavy object at the far end on the opposite side.

(d) Both objects at the ends of the seesaw, on opposite sides of pivot. **[Application]**

(ii) The energy transformation taking place during photosynthesis in plants is:

(a) heat to chemical

(b) chemical to light

(c) light to chemical

(d) chemical to heat **[Recall]**

(iii) Two balls, **A** and **B** have the same gravitational potential energy. Ball **A** is six times the mass of ball **B**. How do their heights above the ground compare?

(a) Height of A is the same as height of B.

(b) Height of A is twice the height of B.

(c) Height of A is one-sixth the height of B.

(d) Height of A is six times the height of B. **[Application]**

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(iv) The Velocity Ratio (V.R.) of a block and tackle system of *three* pulleys with the effort in upward direction is:

(a) 1

(b) 2

(c) 3

(d) 4 **[Application]**

(v) If red, blue, green and yellow lights are allowed to enter the same glass block with the same angle of incidence (∠i), then for which colour will the angle of deviation be the greatest?

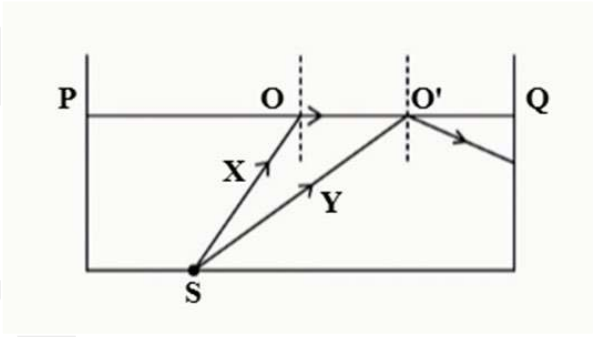
(a) blue

(b) green

(c) yellow

(d) red **[Understanding]**

(vi) The figure shows a source of light **S** at the bottom of a trough containing a transparent liquid. Rays **X** and **Y** emerge from the source. If ∠SOP = 43°, state the possible angle of incidence of ray **Y**.



(a) 43°

(b) 45°

(c) 47°

(d) 49° **[Application]**

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(vii) A concave lens diverges light because its upper and lower parts act as:

(a) inverted prisms

(b) upright prisms

(c) upright and inverted prisms respectively

(d) inverted and upright prisms respectively **[Recall]**

(viii) **Assertion (A):** Blue light scatters more than red light in the atmosphere.

Reason(R): Intensity of scattered light is inversely proportional to the fourth power of wavelength.

(a) (A) is true and (R) is false.

(b) (A) is false and (R) is true.

(c) Both (A) and (R) are true, and (R) is the correct explanation of (A).

(d) Both (A) and (R) are true, but (R) is not the correct explanation of (A). **[Recall]**

(ix) Two sound waves, **X** and **Y** have the same amplitude and the same wave pattern, but their frequencies are 60 Hz and 120 Hz respectively, then:

(a) X will be shriller, and Y will be grave.

(b) X will be grave, and Y will be shriller.

(c) X will differ in quality than Y.

(d) X will be louder than Y. **[Understanding]**

(x) A radioactive nucleus has 90 protons and 140 neutrons. It undergoes *two* successive alpha decays. What are the mass number and atomic number of the final nucleus?

(a) Mass number = 222, atomic number = 86

(b) Mass number = 226, atomic number = 88

(c) Mass number = 224, atomic number = 86

(d) Mass number = 222, atomic number = 88 **[Application]**

(xi) According to the old convention, the colour of the earth wire is:

(a) black

(b) green

(c) yellow

(d) red **[Recall]**

(xii) The amount of heat energy required to melt a given mass of a substance at its melting point, without any rise in its temperature is called the:

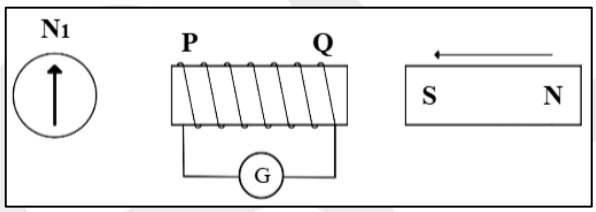
(a) specific heat capacity

(b) specific latent heat of fusion

(c) latent heat of fusion

(d) heat capacity **[Recall]**

(xiii)



The above diagram shows a strong bar magnet moved towards the coil **PQ** along its axis, in the direction shown by the arrow. Which option correctly shows the momentary deflection of magnetic needle $\mathbf{N_1}$ and the direction of current through the galvanometer?

	Deflection of magnetic needle	**Direction of current**
(a)		P→ Q
(b)		Q→ P
(c)		P→ Q
(d)		Q→ P

[Analysis]

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(xiv) A metallic wire is stretched in such a way that its new length becomes twice the original length. How does its **specific heat capacity** change?

(a) becomes double

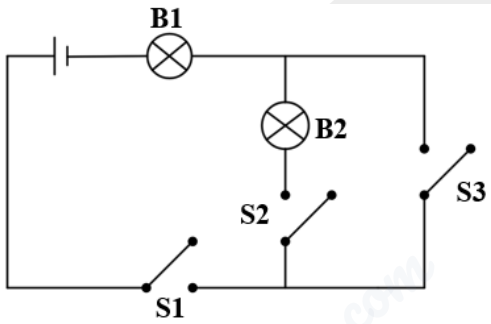
(b) becomes 4 times

(c) becomes $^1/_4$

(d) remains the same

[Understanding]

(xv) Priya built the circuit as shown in the figure given below. If she wants both bulbs (B1 and B2) to glow, which switches (S1, S2, S3) should be kept ON?



(a) S1 and S2 only

(b) S1 and S3 only

(c) S2 and S3 only

(d) S1, S2 and S3

[Application]

Question 2

(i) Complete the following by choosing the correct answers from the bracket: [6]

(a) Friction acts _____ *[tangential / radial]* to a car undergoing circular motion.

(b) A glass prism is immersed in water. The angle of minimum deviation will _____ *[decrease / increase]*.

(c) The CGS unit of specific heat capacity is _____ *[erg g^{-1} K^{-1} / cal/g^{-1} K^{-1}]*.

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(d) The minimum distance for distinct echo formation is _____ *[greater /lesser]* in water as compared to air.

(e) Two copper wires can have different resistivity if they have different _____ *[lengths / temperatures]*.

(f) Nuclear _____ *[fusion / fission]* is possible at ordinary temperature and pressure.

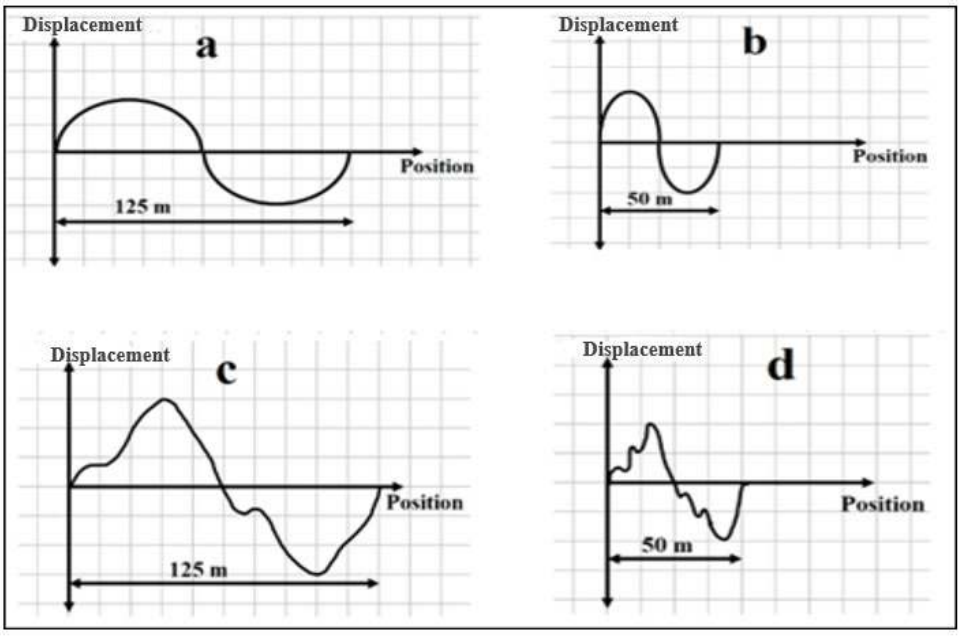
[Recall]

(ii) Match the movement of the body part in **Column A** to the class of lever in **Column B**. [2]

Column A	Column B
(a) Nodding head	1. Class III
(b) Lifting body weight on your toes	2. Class II
	3. Class I

[Understanding]

(iii) Analyse the displacement position graph and answer the questions that follow. [2]



Find *two* figures that show:

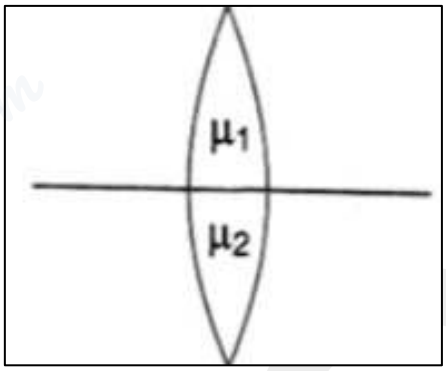
(a) sound of same loudness and pitch but different quality.

(b) sound of same pitch but different loudness. **[Application]**

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Question 3

(i) (a) Refer to the diagram given below. A lens is made of *two* materials of different refractive indices (μ_1, μ_2) as shown. If the rays are coming from a distant object, then how many images will be formed? [2]



[Application]

(b) A glass lens always forms a virtual, erect, and diminished image of an object kept in front of it. Identify the lens. **[Recall]**

(ii) The image given below displays kilowatt-hour meter readings recorded at *two* distinct points in time. [2]



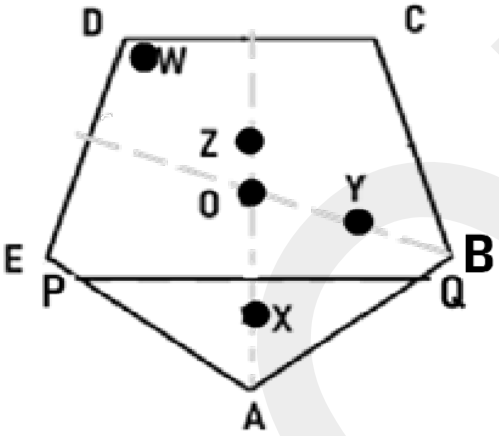
Assuming a **continuously running** 2000W air conditioner as the **sole** electrical device in use, calculate the time interval, **in hours**, between these *two* meter readings. **[Application]**

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(iii) ABCDE is a regular pentagon with its centre of gravity (CG) at **O.** What will be the **most probable position** (**W,** ***X, Y, Z*** *or* ***O)*** of the new centre of gravity: [2]

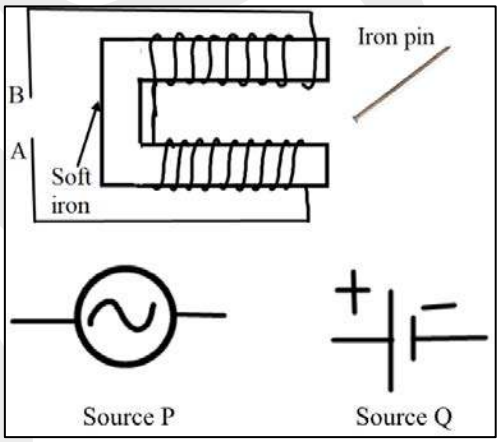
(a) if a piece of clay is attached at point **A**?

(b) if the pentagon is cut along the line **PQ**? (CG o*f the remaining part DCBQPE)*



[Application]

(iv) The diagram given below shows a copper wire wound around a U-shape soft iron bar. An iron pin is brought near the arrangement. First Source **P** and then Source **Q** are connected across **AB**, each operating independently. [2]



(a) State **True** or **False:** Source **P** as well as Source **Q**, when connected across **AB**, can attract the iron pin. **[Understanding]**

(b) Justify your answer to (a) with a suitable reason. **[Understanding]**

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(v) Blocks of identical material, having masses m, $2m$, $3m$, $4m$, and $5m$ are heated to 150°C, and then cooled to 50°C. [2]

(a) Draw the nature of the graph connecting the amount of heat released vs the mass of the blocks. **[Application]**

(b) Write the mathematical expression that enables the determination of the specific heat capacity using the graph. **[Application]**

(vi) Answer the following questions according to the instructions given: [2]

(a) When $^{6}Li_{3}$ is bombarded with a neutron, it produces $^{4}He_{2}$ and an isotope of hydrogen. Write the notation for the hydrogen isotope formed. **[Understanding]**

(b) Fill in the blank: **[Recall]**

The mass of the reactants in a fission reaction is _____ *(greater /less)* than the mass of the products.

(vii) Advanced optical sensors in missiles use fibre optic cables to transmit light signals with minimal loss. This relies on a physical phenomenon that confines light within the fibres, making the system very dependable for guiding the missile precisely. [3]

(a) Name the optical phenomenon that allows light signals to remain confined within the fibre optic cables during transmission. **[Recall]**

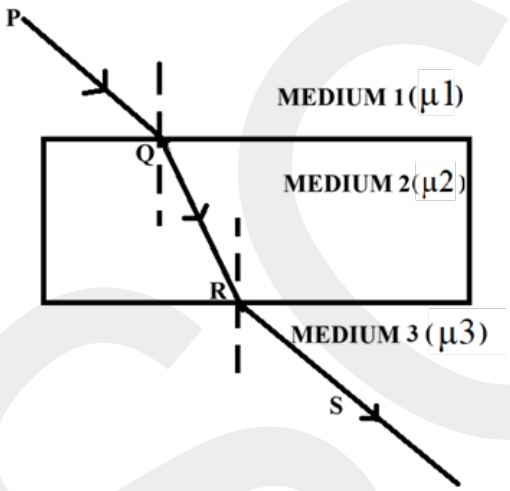
(b) List the *two* main conditions necessary for this phenomenon to occur. **[Understanding]**

SECTION B (40 Marks)

*(Attempt **any four** questions from this Section.)*

Question 4

(i) A diagram shows a ray of light travelling through *three* different transparent media having refractive indices μ_1, μ_2 and μ_3 as shown. Points **Q** and **R** are points on the surfaces separating the media. Given **PQ || RS**. [3]



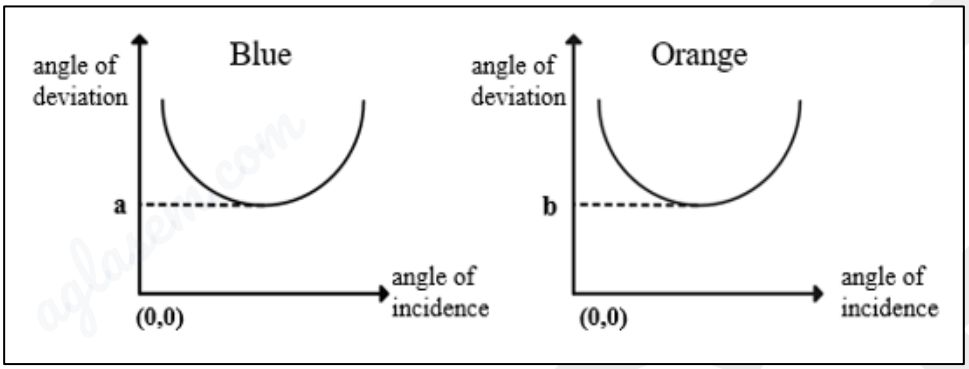
(a) Among the three media shown, in which medium is the speed of light **minimum**? **[Understanding]**

(b) As the ray of light travels from medium 1 to medium 2, how does the wavelength of light change? (State whether it *increases*, *decreases*, or *remains constant*.) **[Understanding]**

(c) State the relationship between the refractive indices μ_1 and μ_3 that ensures the emergent ray (RS) is parallel to the incident ray (PQ). **[Understanding]**

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(ii) The diagram below shows *two* graphs showing variation in angle of deviation against angle of incidence for *two* colours of light (blue, orange) while passing through the same prism. [*Diagrams are not drawn to the same scale.]* [3]



(a) State with a reason whether $a = b$, $a < b$, or $a > b$. **[Application]**

(b) If we increase the angle of the prism then what is the effect on the values of ***a*** and ***b***? **[Application]**

(iii) A candle and a screen are placed 90 cm apart. Steve placed a lens between them such that a clear image is formed on the screen and the image is twice the size of the object. [4]

(a) Which type of *lens* is used by Steve? **[Understanding]**

(b) Write an equation relating the object distance ***u***, image distance ***v***, and the distance between the candle and the screen. **[Application]**

(c) State the *ratio* between the image distance ***v*** and the object distance ***u.*** **[Application]**

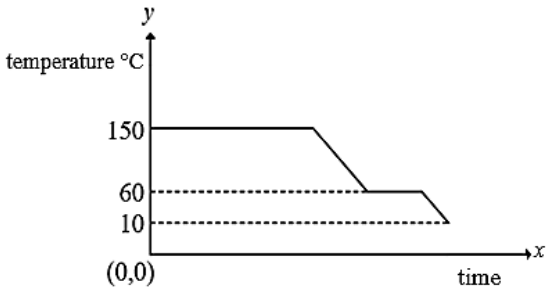
(d) Calculate the *image distance*. **[Application]**

Question 5

(i) Draw a ray diagram to show the formation of an image by a concave lens when the object is placed between F and 2F. [3] **[Application]**

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(ii) The diagram below shows a cooling curve for a substance ***X***: [3]



(a) State the temperature at which the substance condenses. **[Recall]**

(b) Mention the temperature range in which the substance is in its liquid state. **[Understanding]**

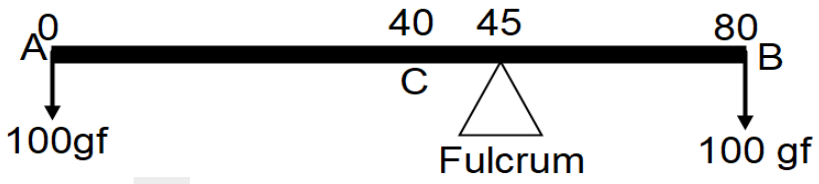
(c) State **True** or **False:** The amount of heat released when a substance is cooled by 10°C in its liquid state is greater than the heat released when it is cooled by the same amount in its solid state. **[Application]**

(iii) In an experiment to measure the temperature of the flame of a Bunsen burner, a lump of copper of mass 0.12 kg is heated on the flame for a long time. The copper then is quickly transferred into a beaker of negligible heat capacity containing 0.84 kg of water and the temperature of the water rose from 15°C to 35°C. Calculate the temperature of the flame. [4]

[Given sp. Heat capacity of copper = 0.4 Jg^{-1} $^oC^{-1}$, Sp. Heat capacity of water = 4.2 Jg^{-1} $^oC^{-1}$.] **[Application]**

Question 6

(i) [3]



A metal rod **AB** of length 80 cm is balanced at 45 cm from the end **A** with 100 gf weights suspended from the two ends.

(a) If this rod is cut at the centre **C**, then compare the weight of **AC** to the weight of **BC**. *(Use >, < or =)*

(b) Give a reason for your answer in (a). **[Analysis]**

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(ii) For each of the following scenarios, state whether the work done by gravity is *positive, negative, or zero*. [3]

(a) A person walks on a levelled road.

(b) A person climbs a ladder.

(c) A car in a neutral gear is coming down the slope. **[Understanding]**

(iii) An empty supermarket trolley of mass 10 kg is moving with a speed of 8 m s^{-1}. An identical trolley is loaded with 10 kg of goods and moves with a speed of 4 m s^{-1}. Both trolleys are brought to rest over the same stopping distance. [4]

(a) Calculate the kinetic energy of the empty trolley. **[Application]**

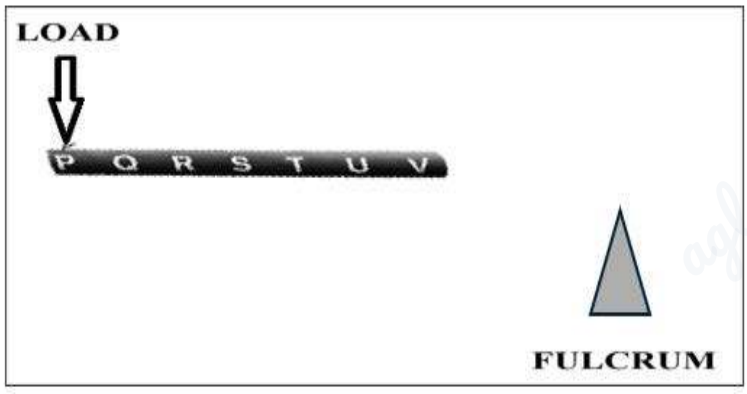
(b) Calculate the kinetic energy of the loaded trolley. **[Application]**

(c) Compare the braking force required to stop the empty trolley and the loaded trolley. **[Analysis]**

(d) Name the principle applied in solving part (c). **[Recall]**

Question 7

(i) A bar of length 120 cm is used as a lever to raise a load placed at point P. Seven equidistant points are marked along the bar: **P, Q, R, S, T, U,** and **V**, each 20 cm apart. You are permitted to place the fulcrum at any of the marked points and exert the effort at a different point. [3]



(a) Specify the *fulcrum* and *effort points* that yield the greatest mechanical advantage. **[Analysis]**

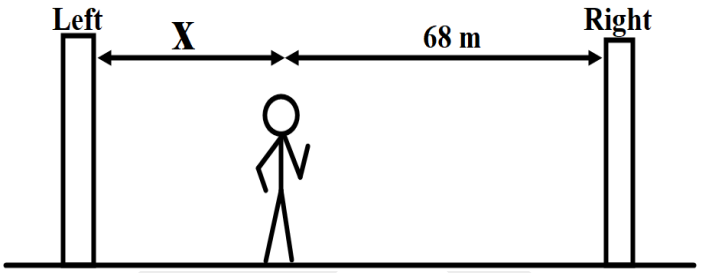
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(b) Based on the lever arrangement identified in part (a), calculate the maximum mechanical advantage using the distances shown in the diagram. **[Application]**

[Recall]

(c) To which class of lever does this arrangement belong?

(ii) A boy is located asymmetrically between two parallel walls, closer to the left wall than the right. If he claps, the time interval between successive echoes is 0.25 s, then find the value of **X** in metres. *[speed of sound in air = 340 m /s.]* [3]



[Application]

(iii) Two wires ***A*** and ***B*** of the same material and length are fixed to a wooden board and stretched under the same tension. The cross-sectional area of wire ***A*** is greater than that of wire ***B***. When set into vibration using identical tuning forks of frequency 300 Hz, only wire ***B*** produces a loud sound. [4]

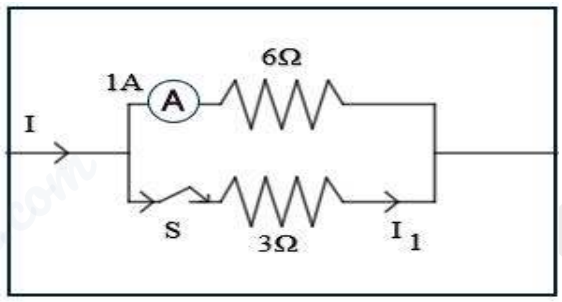
(a) Name and explain the phenomenon responsible for the loud sound produced by wire ***B***. **[Understanding]**

(b) A loud sound is heard from wire ***A*** when the experiment is repeated using a tuning fork of frequency f. Is 'f' greater than, less than or equal to 300 Hz? Justify your answer. **[Application]**

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Question 8

(i) The below diagram shows the part of a complete circuit. The ammeter reads 1A. [3]



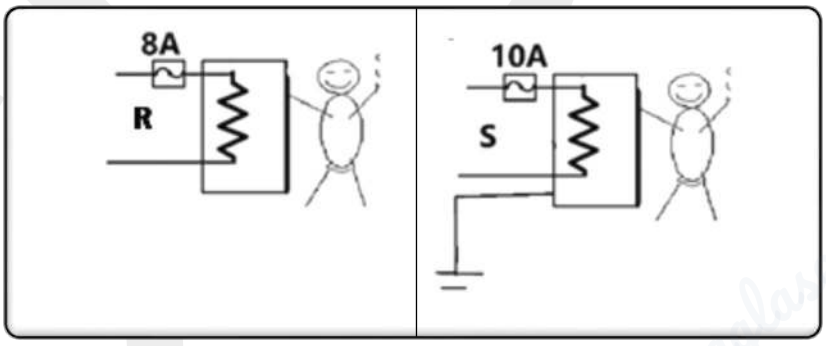
Calculate:

(a) the current $\mathbf{I_1}$ through the 3Ω resistor. **[Application]**

(b) the total current **I** in the circuit. **[Application]**

(c) State **True** or **False**: When the switch (S) is opened and the entire current flows through the 6Ω resistor, the ammeter reading will be $(1+\mathbf{I_1})$. **[Analysis]**

(ii) An appliance with a metal covering, rated at 2 kW, 220 V, is to be connected in a circuit. Given below are *two* diagrams (R & S) depicting different circuit configurations. [3]



(a) Identify the safest circuit. **[Analysis]**

(b) Write *two* reasons, supported by mathematical calculations, where applicable, to justify your choice. **[Application]**

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(iii) A Nichrome wire ***X*** with length (l) and cross-sectional area (A) is connected to a 10 V source and another Nichrome wire ***Y*** with length ($2\ l$) and cross-sectional area ($A/2$), is connected to a 20 V source. [4]

(a) Compare the resistances of wires ***X*** and ***Y***. [Given that the resistivity of Nichrome is (ρ).] **[Application]**

(b) Compare the electrical power consumed by each wire. **[Application]**

(c) Compare the masses of these wires. [Given that the density of nichrome is ***d***.] **[Application]**

(d) State **True** or **False:** Wire ***X*** and wire ***Y*** both show the same rise in temperature at the same time. **[Analysis]**

Question 9

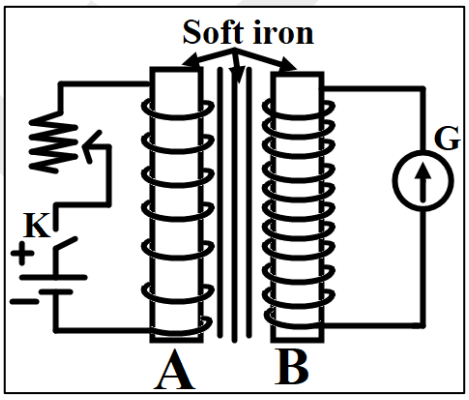
(i) Three bulbs of powers $\mathbf{P_1}$, $\mathbf{P_2}$ and $\mathbf{P_3}$ ($\mathbf{P_1 < P_2 < P_3}$) are connected in a certain way such that $\mathbf{P_3}$ glows the brightest. [3]

(a) What type of connection exists between these bulbs? **[Understanding]**

(b) Compare the voltages ($\mathbf{V_1}$, $\mathbf{V_2}$, $\mathbf{V_3}$) across these bulbs. *(Use >, < or =)* **[Understanding]**

(c) Will the circuit still function if one of the bulbs is fused? **[Understanding]**

(ii) Study the diagram and answer the following questions: [3]



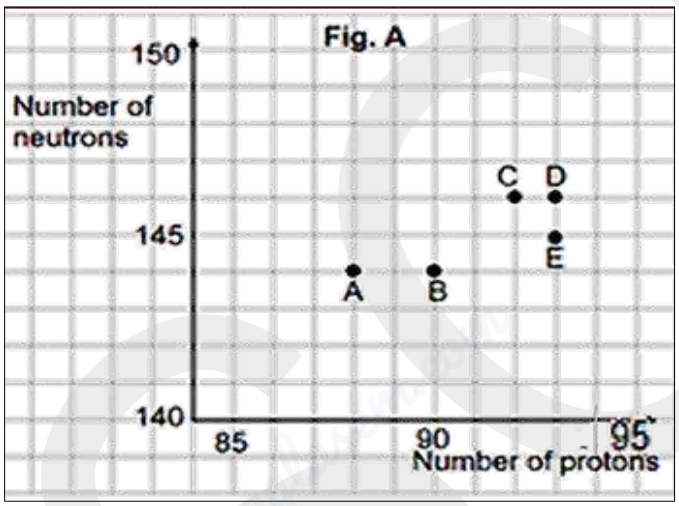
(a) In the given circuit when the key is closed, the galvanometer in the coil B shows momentary deflection. Give a reason for this deflection. **[Understanding]**

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(b) How will the galvanometer deflect if the variable resistance in the closed circuit is decreased? (*in the same direction / in the opposite direction*) **[Application]**

(c) Give a reason for your answer to (b). **[Application]**

(iii) The graph given below illustrates the correlation between the number of protons (x-axis) and the number of neutrons (y-axis) for elements ***A, B, C, D,*** and ***E*** in the periodic table. These elements are denoted by the letters rather than their conventional symbols. [4]



(a) Identify the radioactive radiation emitted when element ***C*** decays into element ***E***. Represent this using a nuclear reaction. **[Application]**

(b) What is the special name given to elements like ***D*** and ***E***? **[Understanding]**

(c) If element ***C*** transforms into element ***B*** by emitting a radioactive ray, how will this ray behave in an electric field? **[Analysis]**

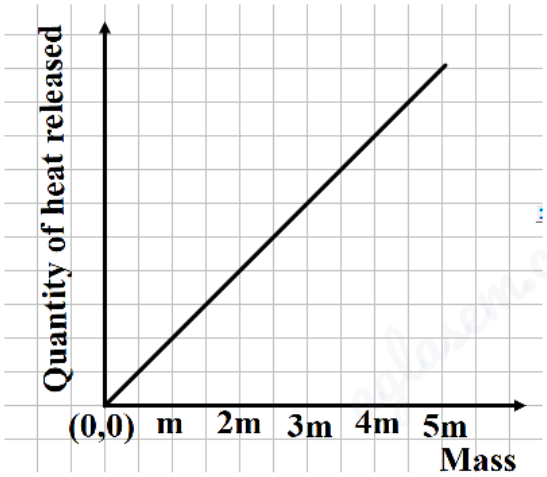
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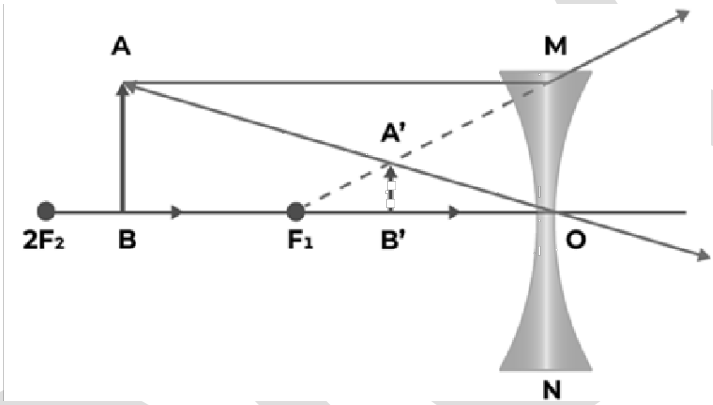
DRAFT MARKING SCHEME – PHYSICS (SCIENCE PAPER 1)

Question 1		[15x1]
(i)	(c) Light object close to the pivot; heavy object at the far end on the opposite side.	
(ii)	(c) light to chemical	
(iii)	(c) Height of A is one-sixth the height of B.	
(iv)	(d) 4	
(v)	(a) blue	
(vi)	(d) 49°	
(vii)	(d) inverted and upright prisms respectively	
(viii)	(c) Both (A) and (R) are true, and (R) is the correct explanation of (A).	
(ix)	(b) X will be grave, and Y will be shriller	
(x)	(a) Mass number = 222, atomic number = 86	
(xi)	(b) green	
(xii)	(c) latent heat of fusion.	
(xiii)	(c)  P → Q	
(xiv)	(d) remains the same	
(xv)	(a) S1 and S2 only	
Question 2		
(i)	(a) radial (b) decrease (c) *erg* g^{-1} K^{-1} (d) greater (e) temperatures (f) fission	[6x1]
(ii)	(a) Nodding head → Class I (b) Lifting body weight on your toes → Class II	[2]
(iii)	(a) b and d (b) a and c	[2]

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Question 3		
(i)	(a) 2 images will be formed (b) concave lens	[2]
(ii)	Energy spent =1567-856 =711kWh Time in hours = 711/2 =355.5 hours	[2]
(iii)	(a) X (b) Z	[2]
(iv)	(a) True (b) Both sources will produce a magnetic field: The attraction of a magnetic material does not depend on the polarity of the magnet.	[2]
(v)	(a)  (b) specific heat capacity $=\frac{slope\ of\ this\ graph}{\Delta t} = \frac{slope\ of\ this\ graph}{100}$	[2]
(vi)	(a) H_1^3 (b) greater	[2]
(vii)	(a) Total internal reflection (b) 1. Light ray should travel from denser to rarer medium. 2. Angle of incidence must be greater than critical angle for a given pair of optical media.	[3]
Question 4		
(i)	(a) In medium 2, of refractive index μ_2 (b) Wavelength decreases (c) $\mu_1 = \mu_3$	[3]

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(ii)	(a) a > b Angle of minimum deviation is inversely proportional to the wavelength of light and wavelength of blue is smaller than wavelength of orange. (b) Values of a and b will increase.	[1+1] [1]
(iii)	(a) Convex lens (b) $v + u = 90$ [*Sign convention to be used only for lens formula & NOT for addition of distances*] (c) $m = -2$ $v:u = 2:1$ or $-2 = \frac{v}{-u}$ (d) $m = \frac{v}{u} \therefore -2 = \frac{v}{-u} \therefore 2u = v$ $As\ v + u = 90 \therefore 2u + u = 90 \therefore 3u = 90 \therefore u = 30$ $u = 30\ cm$ $v = 90 - 30$ $v = 60\ cm$	[1] [1+1+1]
Question 5		
(i)	 Ray 1 → 1 mark Ray 2 → 1 mark Virtual diminished image +arrows →1 mark	[3]
(ii)	(a) 150°C (b) 150°C to 60°C (c) True	[1] [1] [1]
(iii)	Heat lost by Cu = $0.12 \times 400 \times (t - 35)$ Heat gained by water = $0.84 \times 4200 \times (35 - 15)$ $t - 35 = \frac{0.84 \times 4200 \times 20}{0.12 \times 400} = 7 \times 42 \times 5 = 1470\ ^0C$ $t = 1470 + 35 = 1505\ ^0C$	[1] [1] [1] [1]

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Question 6		
(i)	(a) Weight of AC < weight of BC (b) Even though the weights present are the same at both ends, the torque arm of B is less than the torque arm of A. This indicates that the weight of the rod is concentrated more between C and B than between A and C.	[1] [2]
(ii)	(a) No work is done. (b) Negative work is done. (c) Positive work is done.	[1] [1] [1]
(iii)	(a) <u>Empty trolley:</u> Mass = 10kg v =8m/s; KE = ½ mv^2; = 1/2×10 × 8× 8=320J (b) <u>Loaded trolley:</u> Mass =20kg v =4m/s; KE = ½ mv^2; = 1/2×20×4×4=160J (c) $\frac{KE1}{KE2} = \frac{F1.s}{F2.s} = \frac{320}{160} = \frac{2}{1}$ ∴ F1: F2= 2:1 (d) work-energy theorem	[1+1] [1] [1]
Question 7		
(i)	(a) $Fulcrum \rightarrow Q \ and \ effort \rightarrow V$ (b) $Load \ arm = 20cm$ $Effort \ arm = 100cm$ $MA = \frac{EA}{LA} = \frac{100}{20} = 5$ (c) $First \ class \ lever$	[1] [1] [1]
(ii)	Time required for longer distance i.e 68 m $t = \frac{2 \times d}{v}$ $t = \frac{2 \times 68}{340} = \frac{4}{10} = 0.4$ t = $0.4 \ s$ $time \ required \ for \ shorter \ distance \ i.e \ for \ x \ m$ $t = 0.4 - 0.25$ $t = 0.15 \ s$ $0.15 = \frac{2x}{340}$ $2x = 51$ $x = 25.5m$	[1] [1] [1]

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(iii)	(a) Resonance The frequency of the tuning fork (300 Hz) matches the natural frequency of the wire B and the amplitude of vibration increases. (b) f < 300Hz The wire A is thicker than the wire B therefore its natural frequency is less than the wire B.	[1+1] [1+1]
Question 8		
(i)	(a) Since P.D. is same across parallel combination $\therefore 1 \times 6 = I_1 \times 3$ $\therefore I_1 = \frac{6}{3} = 2A$ (b) $I = 1 + 2 = 3A$ (c) False	[1] [1] [1]
(ii)	(a) S (b) metal body of appliance is earthed I = PV = 2000/220 =9.09 A 10A fuse is appropriate	[1] [1+1]
(iii)	(a) $Rof\ X = \frac{\rho l}{A}$ $Rof\ Y = \frac{\rho 2l}{\frac{A}{2}} = 4\frac{\rho l}{A}$ $RX : RY = 1:4$ $(b)\ PX = \frac{V^2}{R} = \frac{10^2}{R}$ $PY == \frac{V^2}{R} = \frac{20^2}{4R}$ $\therefore PX:PY = 1:1$ (c) $mass\ of\ X = A \times l \times d = mass\ of\ Y = \frac{A}{2} \times 2l \times d \therefore mX:mY = 1:1$ (d) $True$ $QX = mc\Delta T = Ald \times c \times \Delta T_X = \frac{V^2 t}{R} = PX \times t \rightarrow eq\ 1$ $QY = mc\Delta T = Ald \times c \times \Delta T_Y = \frac{V^2 t}{R} = PY \times t \rightarrow eq\ 2$ Eq1/eq2 =1 $(rise\ in\ temperature\ will\ be\ same\ in\ both\ wires)$	[1] [1] [1] [1]
Question 9		
(i)	(a) parallel (b) $V_1 = V_2 = V_3$ (c) Yes	[1] [1] [1]
(ii)	(a) Magnetic flux linked with the coil B changes (and due to electromagnetic induction current is induced). (b) The deflection will be in the same direction. (c) This is because when we decrease the resistance, the magnitude of current increases, increasing the magnetic flux.	[1] [1+1]

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(iii)	(a)	β : ${}^{238}_{92}C \rightarrow {}^{238}_{93}E + {}^{0}_{-1}\beta$	[1+1]
	(b)	isotopes	[1]
	(c)	It will shift towards the negative plate	[1]

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