

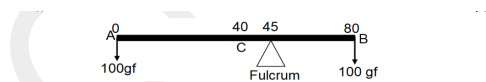
ICSE Class 10 • Physics

Important Questions 2027

Most repeated questions from the last few years of board and sample papers, grouped chapter-wise.

Force, Turning Effect and Equilibrium

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



Seen in: Board 2023 · Sample 2025, 2026, 2027

2. Give a reason for your answer in (a) [comparison of the weights of AC and BC].

Seen in: Sample 2025, 2026, 2027

3. Two bags are suspended from ropes at P and Q on a wheel that can rotate around O; the wheel remains in equilibrium. State with a reason who is carrying the heavier bag.

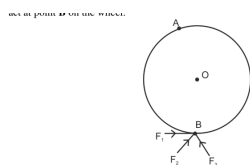
(i)



[3]

Seen in: Sample 2023, 2024

4. The diagram shows wheel O pivoted at point A. Three equal forces F_1 , F_2 and F_3 act at point B on the wheel. Which force will produce maximum moment about A?

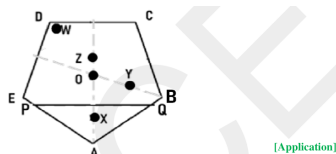


Seen in: Board 2023 · Sample 2023, 2027

5. A moment of couple has a tendency to rotate the body in an anticlockwise direction. The moment of couple is taken as: (a) positive (b) negative (c) maximum (d) zero

Seen in: Sample 2024, 2025, 2026

6. 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 if a piece of clay is attached at point A?



Seen in: Sample 2026, 2027

7. What will be the most probable position of the new centre of gravity if the pentagon is cut along the line PQ (CG of the remaining part DCBQPE)?

Seen in: Sample 2026, 2027

8. Complete by choosing the correct answer: Friction acts _____ [tangential / radial] to a car undergoing circular motion.

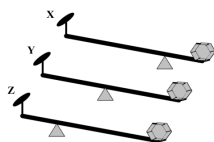
Seen in: Board 2026 · Sample 2027

9. State two factors on which the position of Centre of Gravity of a body depends.

Seen in: Board 2026 · Sample 2023

Work, Energy, Power and Machines

10. Three levers X, Y, Z of equal lengths are shown. Which class of lever do these belong to?



Seen in: Board 2024, 2025 · Sample 2024, 2027

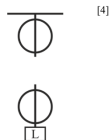
11. Given two pulleys, copy and complete the labelled diagram connecting the two pulleys with a tackle to obtain Velocity Ratio = 2.

(iii) Given are two pulleys.

(a) Copy and complete the labelled diagram connecting the two pulleys with a tackle to obtain Velocity Ratio = 2.

(b) If Load = 48 kgf and efficiency is 80% then calculate:

1. Mechanical Advantage.
2. Effort needed to lift the load.



Seen in: Board 2023, 2024, 2025 · Sample 2025, 2026

12. State whether the work done by gravity is positive, negative, or zero: a person walks on a levelled road.

Seen in: Sample 2025, 2026, 2027

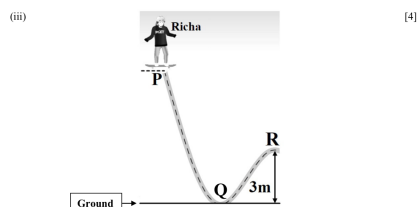
13. State whether the work done by gravity is positive, negative, or zero: a person climbs a ladder.

Seen in: Sample 2025, 2026, 2027

14. State whether the work done by gravity is positive, negative, or zero: a car in a neutral gear is coming down the slope.

Seen in: Sample 2025, 2026, 2027

15. Richa weighing 40 kgf leaves point P on her skateboard and reaches point Q on the ground with velocity 10 ms^{-1} . Calculate the kinetic energy of Richa at point Q.



Seen in: Board 2025 · Sample 2027

16. The kinetic energy of a given body depends on the: (a) position (b) centre of gravity (c) momentum (d) displacement

Seen in: Sample 2024, 2025, 2026

17. During power production in a coal-based thermoelectric power plant, the correct sequence of energy conversions taking place is: (a) heat $\rightarrow$ mechanical $\rightarrow$ chemical (b) heat $\rightarrow$ mechanical $\rightarrow$ electrical (c) chemical $\rightarrow$ heat $\rightarrow$ light (d) heat $\rightarrow$ chemical $\rightarrow$ electrical

Seen in: Sample 2024, 2025, 2026

18. Match the movement of the body part to the class of lever: Nodding head.

Seen in: Sample 2026, 2027

19. Match the movement of the body part to the class of lever: Lifting body weight on your toes.

Seen in: Sample 2026, 2027

20. Based on the lever arrangement identified in part (a), calculate the maximum mechanical advantage using the distances shown.

Seen in: Sample 2024, 2027

21. Complete by choosing the correct answer: If the mass as well as the velocity of a body is doubled then the kinetic energy of the body _____ [is doubled / becomes eight times / becomes four times] the initial kinetic energy.

Seen in: Board 2023 · Sample 2023, 2025

22. Complete by choosing the correct answer: A _____ [Class II / Class III] lever will always have M.A. > 1 .

Seen in: Sample 2025, 2026

23. Calculate the potential energy gained by a load of 100 kgf lifted by this pulley to a height of 5 m. ($g = 10 \text{ ms}^{-2}$)

Seen in: Sample 2025, 2026

24. 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

Seen in: Board 2026 · Sample 2027

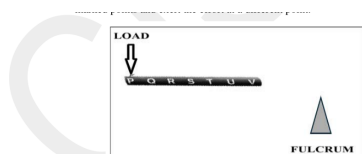
25. The Velocity Ratio (V.R.) of a block and tackle system of three pulleys with the effort in upward direction is: (a) 1 (b) 2 (c) 3 (d) 4

Seen in: Board 2026 · Sample 2027

26. If Load = 48 kgf and efficiency is 80% then calculate: 1. Mechanical Advantage. 2. Effort needed to lift the load.

Seen in: Board 2024 · Sample 2023, 2024

27. A bar of length 120 cm is used as a lever to raise a load placed at point P. Seven equidistant points P, Q, R, S, T, U, V are marked 20 cm apart. Specify the fulcrum and effort points that yield the greatest mechanical advantage.



Seen in: Board 2025 · Sample 2027

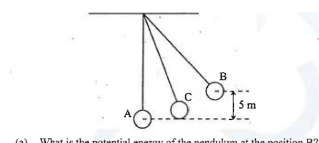
28. Calculate the speed of the ball at which it hits the ground. [$g = 10 \text{ m/s}^2$]

Seen in: Board 2026 · Sample 2026

29. Draw a graph of potential energy vs height for a body thrown vertically upwards. [Assume no friction is present.]

Seen in: Sample 2024, 2025

30. A simple pendulum of mass 200 g is displaced from mean position A to extreme position B, being raised by 5 m; potential energy at A is zero. What is the potential energy of the pendulum at position B? ($g = 10 \text{ ms}^{-2}$)



Seen in: Sample 2024, 2025

31. What is the total mechanical energy at point C?

Seen in: Sample 2024, 2025

32. What is the speed of the bob at position A when released from B? (Take $g = 10 \text{ ms}^{-2}$, no loss of energy.)

Seen in: Sample 2024, 2025

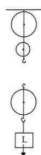
33. The adjacent diagram shows the movable block of a block and tackle system with effort in a convenient direction. From the diagram we can conclude that the number of pulleys used in the fixed block are _____. (a) 1 (b) 3 (c) 2 (d) 4

- (iv) The adjacent diagram shows the movable block of a block and tackle system with effort in a convenient direction. From the diagram we can conclude that the number of pulleys used in the fixed block are _____.
(a) 1
(b) 3



Seen in: Sample 2023, 2025

34. The diagram shows a block and tackle system. Copy and complete the labelled diagram showing the correct connection of the tackle and the direction of the forces involved to obtain maximum V.R. with the convenient direction.



Seen in: Sample 2023, 2024

35. A ball of mass 20 g falls from a height of 45 m and rebounds to a height of 40 m. Calculate the initial potential energy of the ball. [$g = 10 \text{ m/s}^2$]

Seen in: Board 2026 · Sample 2023

36. Sumit does 600 J of work in 10 min and Amit does 300 J of work in 20 min. Calculate the ratio of the powers delivered by them.

Seen in: Board 2023, 2024

Refraction of Light and Lenses

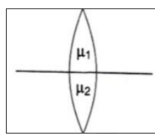
37. A glass lens always forms a virtual, erect, and diminished image of an object kept in front of it. Identify the lens.

Seen in: Sample 2023, 2024, 2025, 2026, 2027

38. Advanced optical sensors in missiles use fibre optic cables to transmit light signals with minimal loss. Name the optical phenomenon that allows light signals to remain confined within the fibre optic cables during transmission.

Seen in: Sample 2024, 2025, 2026, 2027

39. 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?

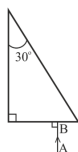


(b) A glass lens always forms a virtual, erect, and diminished image of

[Application]

Seen in: Sample 2024, 2025, 2026, 2027

40. Redraw the diagram and complete the path of the light ray AB through the glass prism till it emerges out of the prism. Critical angle of the glass is 42° .



Seen in: Board 2023, 2025, 2026 · Sample 2023, 2024

41. The diagram shows a fish in the tank and its image seen on the surface of water. Name the phenomenon responsible for the formation of this image.



Seen in: Sample 2024, 2025, 2026

42. An object is placed at a distance of 24 cm in front of a convex lens of focal length 8 cm. What is the nature of the image so formed?

Seen in: Sample 2024, 2025, 2026

43. Calculate the distance of the image from the lens.

Seen in: Sample 2024, 2025, 2026

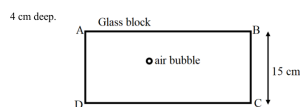
44. List the two main conditions necessary for this phenomenon to occur.

Seen in: Sample 2026, 2027

45. The refractive index of water is 1.33 at a certain temperature. When the temperature of water is increased by 40°C , the refractive index changes to 'x'. State whether $x < 1.33$ or $x > 1.33$.

Seen in: Board 2024 · Sample 2024, 2025

46. A rectangular glass block of refractive index 1.5 has an air bubble trapped inside it; when seen from surface AB it appears to be 4 cm deep. Calculate the actual depth of the air bubble from the surface AB.

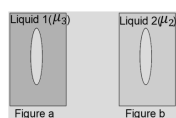


Seen in: Board 2023, 2025 · Sample 2026

47. A convex lens with a focal length of 12 cm has an object at a distance of 20 cm in front of the lens. A blurred image is obtained on the screen placed at a distance of 23 cm in front of the lens. In order to obtain a clear image, the screen has to be moved: (a) towards the lens. (b) away from the lens. (c) to a position very far from the lens. (d) either towards or away from the lens.

Seen in: Sample 2025, 2026

48. A double convex lens with refractive index μ_1 is placed inside two liquids of refractive indices μ_2 and μ_3 , with $\mu_2 > \mu_1$ and $\mu_1 > \mu_3$. How would a parallel incident beam of light refract when it comes out of the lens in each of the cases: (1) in Figure a (2) in Figure b?



Seen in: Sample 2025, 2026

49. 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.)

Seen in: Board 2026 · Sample 2027

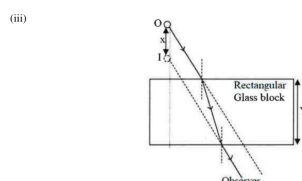
50. A candle and a screen are placed 90 cm apart. A lens is placed between them such that a clear image is formed on the screen and the image is twice the size of the object. Which type of lens is used?

Seen in: Sample 2023, 2027

51. State two differences between normal reflection and total internal reflection.

Seen in: Sample 2024, 2025

52. The diagram shows that an observer sees the image of an object O at I through a glass block. Name and define the phenomenon responsible for seeing the image at a different position.



Seen in: Sample 2023, 2024

53. State the effect on X (apparent shift) when: 1. Y (thickness) increases 2. Y decreases.

Seen in: Sample 2023, 2024

54. An object is placed in front of a concave lens at a distance of 45 cm from it. If its image is formed at a distance of 30 cm from the lens, calculate the focal length of the lens.

Seen in: Board 2025 · Sample 2023

55. Small air bubbles rising up a fish tank appear silvery when viewed from some particular angle is due to the: (a) reflection (b) refraction (c) dispersion (d) total internal reflection

Seen in: Board 2023 · Sample 2023

56. Linear magnification (m) produced by a concave lens is: (a) $m < 1$ (b) $m > 1$ (c) $m = 1$ (d) $m = 2$

Seen in: Board 2023, 2024

Spectrum and Dispersion

57. Name the invisible radiation which is studied using the quartz prism.

Seen in: Board 2025 · Sample 2024, 2025, 2026

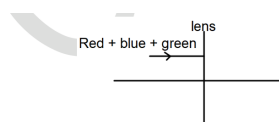
58. Assertion (A): Blue light scatters more than red light in the atmosphere. Reason (R): Intensity of scattered light is inversely proportional to the fourth power of wavelength. (a) (A) is true and (R) is false. (b) (A) is false and (R) is true. (c) Both (A) and (R) are true, and (R) is the correct explanation of (A). (d) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

Seen in: Board 2024, 2025, 2026 · Sample 2027

59. If red, blue, green and yellow lights are allowed to enter the same glass block with the same angle of incidence ($\angle i$), then for which colour will the angle of deviation be the greatest? (a) blue (b) green (c) yellow (d) red

Seen in: Sample 2024, 2025, 2027

60. A mixture of red, blue, and green light rays is passed through a convex lens. State whether the ray passes through a single point or through different points on the principal axis after refraction.



Seen in: Sample 2024, 2025, 2026

61. Name one type of radiation with a wavelength greater than that of the radiation mentioned by you in (b) above.

Seen in: Sample 2024, 2025, 2026

- 62.** Inside the prism, during the dispersion of white light, compared to blue, red light: (a) slows down less and refracts more. (b) slows down more and refracts less. (c) slows down more and refracts more. (d) slows down less and refracts less.

Seen in: Sample 2025, 2026

- 63.** State one use of the radiation mentioned by you in (b) above.

Seen in: Sample 2025, 2026

- 64.** Assertion (A): Infrared radiations travel long distance through a dense fog and mist. Reason (R): Infrared radiations undergo minimal scattering in earth's atmosphere. (a) both A and R are true and R is the correct explanation of A. (b) both A and R are True and R is not the correct explanation of A. (c) assertion is false but reason is true. (d) assertion is true but reason is false.

Seen in: Sample 2024, 2025

- 65.** If instead of sunlight, a green-coloured ray is passed through a glass prism, what will be the colour of the emergent ray?

Seen in: Sample 2024, 2025

- 66.** Speed of blue light in water is: (a) more than green light (b) more than orange light (c) more than violet light (d) more than red light

Seen in: Board 2023 · Sample 2023

- 67.** Which one of the following combinations is the correct ascending order of electromagnetic waves in terms of wavelength? (a) gamma-rays, visible light, microwaves (b) microwaves, visible light, gamma-rays (c) gamma-rays, microwaves, visible light (d) microwaves, gamma-rays, visible light

Seen in: Board 2024, 2025

- 68.** Name one property common to all electromagnetic radiations.

Seen in: Board 2024, 2025

- 69.** Name the radiation which is used in traffic signals in India.

Seen in: Board 2024, 2025

Sound

- 70.** 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.

Seen in: Sample 2024, 2025, 2026, 2027

- 71.** A person standing in front of a cliff fires a gun and hears its echo after 3 s. Speed of sound in air is 336 ms^{-1} . Calculate the distance of the person from the cliff.

Seen in: Sample 2023, 2024, 2025, 2026

- 72.** After moving a certain distance from the cliff, he fires the gun again and this time the echo is heard 1.5 s later than the first. Calculate the distance that the person has moved.

Seen in: Sample 2023, 2024, 2025, 2026

- 73.** Name the wave used for echo depth sounding.

Seen in: Board 2024 · Sample 2024, 2025, 2026

- 74.** Give one reason why the waves mentioned in (a) are used for the above purpose.

Seen in: Sample 2024, 2025, 2026

- 75.** A mother pushes her daughter on a swing going through positions A, B, C (A and C extreme, B mean). Which is the right position (A, B or C) for the mother to give a constant periodic push in the forward direction to increase the amplitude of the swing?

(iii)



[4]

Seen in: Sample 2025, 2026

- 76.** Name the phenomenon involved in this.

Seen in: Sample 2025, 2026

- 77.** On the basis of this example, explain how this phenomenon helps to increase the amplitude of the swing.

Seen in: Sample 2025, 2026

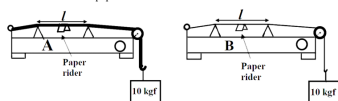
- 78.** Name the important characteristic of sound that is affected during this phenomenon.

Seen in: Board 2023 · Sample 2023, 2024

- 79.** A boy tunes a radio channel to a radio station 93.5 MHz. Name and define the scientific wave phenomenon involved in tuning the radio channel.

Seen in: Board 2023 · Sample 2023, 2024

- 80.** Two sound boxes A and B have wires of same length (l) and tension (10 kgf) but different cross-sectional areas. Vibrating tuning forks of frequency 300 Hz are placed on the boxes; the paper rider falls off in case of B but not in case of A. Name and explain the phenomenon responsible for the falling off of the paper rider in B.



Seen in: Board 2025 · Sample 2027

- 81.** 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.

Seen in: Board 2025 · Sample 2027

- 82.** One end of a plastic foot ruler is held tightly at the edge of a table and the other end is plucked. Name the vibrations produced in the ruler.

Seen in: Board 2023, 2026 · Sample 2023

- 83.** Complete by choosing the correct answer: The minimum distance for distinct echo formation is _____ [greater / lesser] in water as compared to air.

Seen in: Board 2024 · Sample 2027

- 84.** When the stem of vibrating tuning fork is pressed on a table, the tabletop starts vibrating. These vibrations are definitely an example of: (a) resonance (b) natural vibrations (c) forced vibrations (d) damped vibrations

Seen in: Board 2023, 2024 · Sample 2024

- 85.** Convert 93.5 MHz to SI unit.

Seen in: Sample 2023, 2024

- 86.** Complete by choosing the correct answer: Quality of sound depends on its _____ [amplitude / waveform].

Seen in: Board 2023, 2026

- 87.** State one way to increase the frequency of these vibrations.

Seen in: Board 2023 · Sample 2023

- 88.** A submarine in the sea sends an ultrasonic ping and a stopwatch is started simultaneously. The stopwatch stops on receiving the reflected wave from an obstacle and reads 1 minute 40 seconds. Calculate the distance of the obstacle from the submarine. (Speed of sound in water 1500 ms^{-1} .)

Seen in: Board 2023, 2025

Current Electricity and Household Circuits

89. According to the old convention, the colour of the earth wire is: (a) black (b) green (c) yellow (d) red

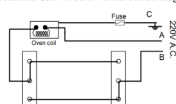
Seen in: Sample 2024, 2025, 2026, 2027

90. Compare ($>$ or $<$ or $=$) the specific resistance in both cases.

Seen in: Sample 2023, 2024, 2025, 2026

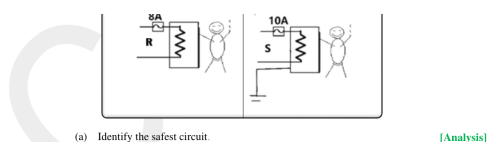
91. Tim wants to connect a fuse to his oven and control it from two different locations, as shown in the circuit diagram. Which one of the two, A or B, should be a live wire?

from two different locations. Shown below is his circuit diagram.



Seen in: Board 2023 · Sample 2023, 2024

92. An appliance with a metal covering, rated at 2 kW, 220 V, is to be connected in a circuit. Given two diagrams (R and S) depicting different circuit configurations, identify the safest circuit.



Seen in: Sample 2025, 2026, 2027

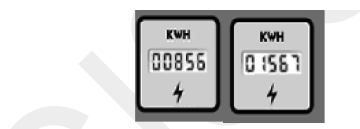
93. Calculate the current through the $3\ \Omega$ resistance when the circuit is complete.

Seen in: Sample 2023, 2024, 2025

94. Complete by choosing the correct answer: Two copper wires can have different resistivity if they have different _____ [lengths / temperatures].

Seen in: Sample 2026, 2027

95. The image displays kilowatt-hour meter readings recorded at two distinct points in time. Assuming a continuously running 2000 W air conditioner as the sole electrical device in use, calculate the time interval, in hours, between these two meter readings.



Seen in: Sample 2026, 2027

96. Write two reasons, supported by mathematical calculations where applicable, to justify your choice of the safest circuit.

Seen in: Sample 2026, 2027

- 97.** 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 ($2l$) and cross-sectional area ($A/2$) is connected to a 20 V source. Compare the resistances of wires X and Y. [Given the resistivity of Nichrome is ρ .]

Seen in: Sample 2026, 2027

- 98.** Compare the electrical power consumed by each wire.

Seen in: Sample 2026, 2027

- 99.** Compare the masses of these wires. [Given the density of nichrome is d .]

Seen in: Sample 2026, 2027

- 100.** State True or False: Wire X and wire Y both show the same rise in temperature at the same time.

Seen in: Sample 2026, 2027

- 101.** Three bulbs of powers P_1 , P_2 and P_3 ($P_1 < P_2 < P_3$) are connected in a certain way such that P_3 glows the brightest. What type of connection exists between these bulbs?

Seen in: Sample 2026, 2027

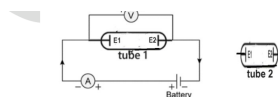
- 102.** Compare the voltages (V_1 , V_2 , V_3) across these bulbs. (Use $>$, $<$ or $=$)

Seen in: Sample 2026, 2027

- 103.** Will the circuit still function if one of the bulbs is fused?

Seen in: Sample 2026, 2027

- 104.** A circuit is used for studying Ohm's Law using a glass tube filled with mercury (tube 1) connected through electrodes E1 and E2; the experiment is repeated with tube 2 which the same amount of mercury fills. Neglecting internal resistance, use ($>$ or $<$ or $=$) to compare the resistance in both cases.



Seen in: Sample 2025, 2026

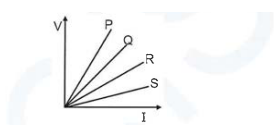
- 105.** Compare ($>$ or $<$ or $=$) the voltmeter readings in both cases.

Seen in: Sample 2025, 2026

- 106.** What is the meaning of the statement that the bulb is rated 600 W, 220 V?

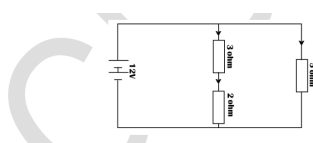
Seen in: Board 2023 · Sample 2023, 2024

- 107.** The graph of voltage vs current for four different materials is shown. Which of these four materials would be used for making filament of a bulb? (a) Q (b) S (c) P (d) R



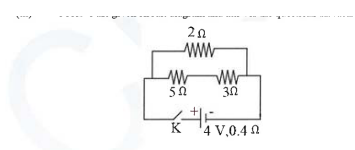
Seen in: Sample 2024, 2025

- 108.** In the circuit given below, identify the correct relation between the currents flowing through the $2\ \Omega$, $3\ \Omega$, and $5\ \Omega$ resistors: (a) current through $2\ \Omega >$ current through $3\ \Omega$ (b) current through $5\ \Omega <$ current through $3\ \Omega$ (c) current through $2\ \Omega =$ current through $5\ \Omega$ (d) current through $5\ \Omega >$ current through $3\ \Omega$



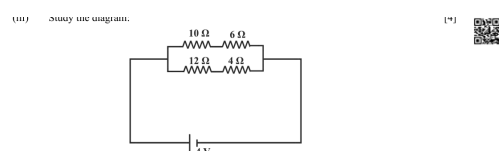
Seen in: Board 2024 · Sample 2026

- 109.** Observe the given circuit diagram ($2\ \Omega$ in parallel with series $5\ \Omega$ and $3\ \Omega$, cell $4\ \text{V}$, $0.4\ \Omega$, key K). Calculate the resistance of the circuit when the key K completes the circuit.



Seen in: Sample 2023, 2025

- 110.** Study the circuit diagram. Calculate the total resistance of the circuit.



Seen in: Board 2024 · Sample 2024

- 111.** An electric iron rated $1100\ \text{W}$, $220\ \text{V}$ is operated for 5 hours. Calculate the minimum rating of the fuse required.

Seen in: Board 2024, 2026

- 112.** Identify the option that displays the correct wiring with correct colour code: (a) (b) (c) (d) [diagram options]

Seen in: Board 2024 · Sample 2023

- 113.** If the bulb B3 is removed from the circuit, then will the brightness of the bulb B1 increase, decrease or remain the same?

Seen in: Board 2024, 2025

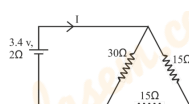
- 114.** In a closed circuit containing a bulb and a cell, the electromotive force (ϵ) and the terminal voltage (V) is related as (I is current, r is internal resistance): (a) $V = \epsilon + Ir$ (b) $V = \epsilon - Ir$ (c) $V = \epsilon \div Ir$ (d) $V = \epsilon \times Ir$

Seen in: Board 2023, 2025

- 115.** The specific resistance of a conductor depends on its: (a) length (b) material (c) area of cross section (d) radius

Seen in: Board 2023, 2024

- 116.** For the given circuit, calculate the current I drawn from the cell.

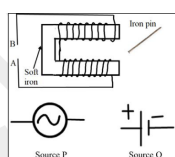


(a) Calculate the current I .

Seen in: Board 2023, 2024

Magnetic Effect of Current and Electromagnetic Induction

- 117.** A copper wire is 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. State True or False: Source P as well as Source Q, when connected across AB, can attract the iron pin.



Seen in: Sample 2026, 2027

- 118.** Justify your answer to (a) with a suitable reason.

Seen in: Sample 2026, 2027

- 119.** Name the law used to determine the direction of motion of PQ.

Seen in: Board 2023, 2025 · Sample 2023

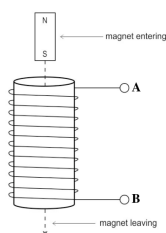
- 120.** A transformer is used to change a high alternating e.m.f. to a low alternating e.m.f. of the same frequency. Identify the type of transformer used for the above purpose.

Seen in: Sample 2024, 2025

- 121.** State whether the turns ratio of the above transformer is $=1$ or >1 or <1 .

Seen in: Sample 2024, 2025

- 122.** A magnet is released along the axis of a copper coil. State the polarity at the top end of the coil when the magnet leaves the coil.

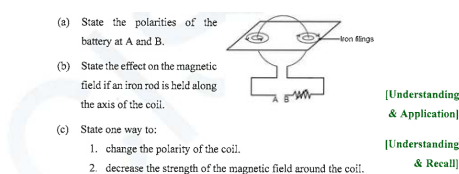


Seen in: Sample 2023, 2024

- 123.** Name the law which can be used to determine the direction of the induced current in the coil.

Seen in: Sample 2023, 2024

- 124.** A wire bent in the form of a loop passes through a cardboard on which iron filings are kept; when current flows the filings arrange as shown with the direction of the magnetic field. State the polarities of the battery at A and B.



Seen in: Board 2023 · Sample 2025

- 125.** State the effect on the magnetic field if an iron rod is held along the axis of the coil.

Seen in: Board 2023 · Sample 2025

- 126.** State one way to: 1. change the polarity of the coil. 2. decrease the strength of the magnetic field around the coil.

Seen in: Board 2023 · Sample 2025

- 127.** State one factor that affects the magnitude of induced current in an AC generator.

Seen in: Board 2024 · Sample 2024

Calorimetry and Latent Heat

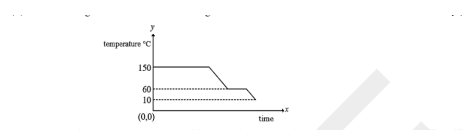
- 128.** Mention the temperature range in which the substance is in its liquid state.

Seen in: Sample 2023, 2024, 2025, 2026, 2027

- 129.** 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

Seen in: Sample 2024, 2025, 2026, 2027

- 130.** The diagram shows a cooling curve for a substance X. State the temperature at which the substance condenses.



Seen in: Sample 2024, 2025, 2026, 2027

- 131.** 30 g of ice at 0°C is used to bring down the temperature of a certain mass of water at 70°C to 20°C. Find the mass of water. [Specific heat capacity of water = $4.2 \text{ Jg}^{-1}\text{°C}^{-1}$ and specific latent heat of ice = 336 Jg^{-1} .]

Seen in: Board 2024, 2025 · Sample 2024, 2025

- 132.** Heat capacity of a body is the: (a) energy needed to melt a body without change in its temperature. (b) energy needed to raise the temperature of a body by 1°C. (c) increase in volume of the body when its temperature increases by 1°C. (d) total amount of internal energy that is constant.

Seen in: Sample 2024, 2025, 2026

- 133.** A solid of mass 60 g at 100°C is placed in 150 g of water at 20°C. The final steady temperature is 25°C. Calculate the heat capacity of the solid. [sp. heat capacity of water = $4.2 \text{ J g}^{-1} \text{ K}^{-1}$]

Seen in: Sample 2024, 2025, 2026

- 134.** Why do we prefer ice to ice-cold water for cooling a drink?

Seen in: Sample 2023, 2024, 2025

- 135.** Complete by choosing the correct answer: The CGS unit of specific heat capacity is _____ [$\text{erg g}^{-1} \text{ K}^{-1}$ / $\text{cal g}^{-1} \text{ K}^{-1}$].

Seen in: Sample 2026, 2027

- 136.** 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.

Seen in: Sample 2026, 2027

- 137.** 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 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. [sp. heat capacity of copper = $0.4 \text{ Jg}^{-1}\text{°C}^{-1}$, sp. heat capacity of water = $4.2 \text{ Jg}^{-1}\text{°C}^{-1}$]

Seen in: Sample 2026, 2027

138. Each of the substances given below is supplied with the same amount of heat. Which one will attain the highest temperature? Lead (0.031), Aluminium (0.21), Copper (0.095), Iron (0.115) cal/g°C. (a) Aluminium (b) Copper (c) Iron (d) Lead

Seen in: Board 2023, 2025 · Sample 2023

139. 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

Seen in: Board 2026 · Sample 2027

140. Complete by choosing the correct answer: Heat absorbed during change of phase depends on _____ [mass / change in temperature / specific heat capacity] of the substance.

Seen in: Board 2023, 2025 · Sample 2023

141. Which material, X or Y, would you select to make a calorimeter?

Seen in: Board 2023, 2025

142. Atmospheric temperature after a hailstorm is greater than the temperature during the hailstorm. State True or False.

Seen in: Board 2024, 2026

143. State the principle of Calorimetry.

Seen in: Board 2023, 2026

144. Calculate the amount of heat absorbed by 200 g of paraffin wax to melt completely at its melting point. [Specific latent heat of fusion of paraffin wax = 146 Jg^{-1}]

Seen in: Board 2024, 2025

145. Calculate the total amount of heat energy required to melt 200 g of ice at 0°C to water at 100°C . (Specific latent heat of ice = 336 J g^{-1} , specific heat capacity of water = $4.2 \text{ J g}^{-1} ^\circ\text{C}^{-1}$)

Seen in: Board 2023 · Sample 2023

146. A metal piece of mass 5 g has thermal capacity 2.5 JK^{-1} . If the mass of the metal is tripled, then its specific heat capacity will be: (a) 7.5 JK^{-1} (b) 2.5 JK^{-1} (c) $1.5 \text{ Jg}^{-1}\text{K}^{-1}$ (d) $0.5 \text{ Jg}^{-1}\text{K}^{-1}$

Seen in: Board 2023, 2025

Modern Physics (Radioactivity and Nuclear Energy)

147. A nucleus of an atom consists of 146 neutrons and 95 protons. It decays after emitting an alpha particle. How many protons and neutrons are left in the nucleus after an alpha emission? (a) protons = 93, neutrons = 142 (b) protons = 95, neutrons = 144 (c) protons = 93, neutrons = 144 (d) protons = 95, neutrons = 142

Seen in: Sample 2024, 2025, 2026

148. Name the radiation that is emitted during the decay of a nucleus that has the highest penetrating power.

Seen in: Sample 2024, 2025, 2026

149. Does the emission of the above-mentioned radiation result in a change in the mass number?

Seen in: Sample 2024, 2025, 2026

150. When ${}^6_3\text{Li}$ is bombarded with a neutron, it produces ${}^4_2\text{He}$ and an isotope of hydrogen. Write the notation for the hydrogen isotope formed.

Seen in: Board 2025 · Sample 2027

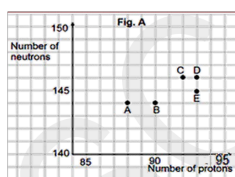
151. What is the general name of the elements X and Y?

Seen in: Sample 2023, 2024, 2025

152. If the atomic number of Y is 80 then what is the atomic number of X?

Seen in: Sample 2023, 2024, 2025

153. A graph shows number of protons (x-axis) vs number of neutrons (y-axis) for elements A, B, C, D, E. Identify the radioactive radiation emitted when element C decays into element E. Represent this using a nuclear reaction.



Seen in: Sample 2026, 2027

154. What is the special name given to elements like D and E?

Seen in: Sample 2026, 2027

155. If element C transforms into element B by emitting a radioactive ray, how will this ray behave in an electric field?

Seen in: Sample 2026, 2027

156. Which element is used in the lining of the special aprons worn by workers in nuclear power plants?

Seen in: Board 2023, 2026

157. A radioactive nucleus X emits an alpha particle followed by two beta particles to form nucleus Y. With respect to the element X, where would you position the element Y in the periodic table?

Seen in: Sample 2024, 2025

158. Which point on the graph indicates the daughter nucleus after Cm undergoes radioactive decay of 1 α followed by 2 β ?

Seen in: Board 2025 · Sample 2025

159. Copy and complete the following nuclear reaction: $\{ \}^{222}_{86}\text{Rn} \rightarrow \{ \}^{218}_{84}\text{Po} + \{ \} \text{---} \text{X}$

Seen in: Sample 2023, 2024

160. What will be the effect on the radiation X, emitted in the above reaction, when it is allowed to pass through an electric field?

Seen in: Sample 2023, 2024

161. State the mass number of the daughter nucleus.

Seen in: Board 2025 · Sample 2023

162. Complete by choosing the correct answer: _____ radiation deviates minimum in a magnetic field. [Alpha / Beta].

Seen in: Board 2023, 2026

163. Complete by choosing the correct answer: The nuclear radiation with lowest ionizing power is _____ [α / β / γ].

Seen in: Board 2023, 2025

164. A radioactive element is placed in an evacuated chamber. Then the rate of radioactive decay will: (a) Decrease (b) Increase (c) Remain unchanged (d) Depend on the surrounding temperature

Seen in: Board 2023, 2024

165. Complete the following radioactive reaction: $\{ \} \text{X} \rightarrow \text{Y} + 2 \{ \}^4\text{He} \rightarrow \{ \}^{234}_{91}\text{Z} + \{ \}^0_{-1}\text{e}$

Seen in: Board 2023, 2024