# Training Models For third secondary

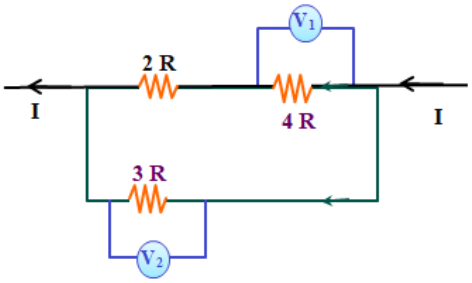
# Physics

## Model (2)- English

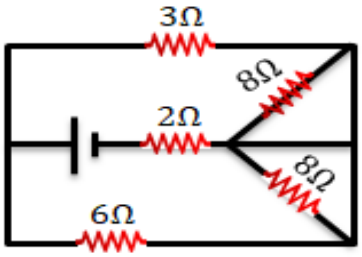
## 2025-2026

## First: objective questions (multiple choice)"all Question of one mark"

| | | |
|---|---|---|
| 1 | **A metal wire made of a certain material, its length ( L) , cross-sectional area (A) if wire's resistance is (R), which of the following choices will lead to obtain the highest electric resistance value without changing the wire's temperature or material type?** | |
| | **A** | Uniformly drawn the wire to twice its original length |
| | **B** | The wire drawn uniformly to three times its original length |
| | **C** | Replace the wire with another one of four times or its original length and has the same cross-sectional area A) |
| | **D** | Replace the wire with another one of six times its original length and has the same cross-sectional area A) |

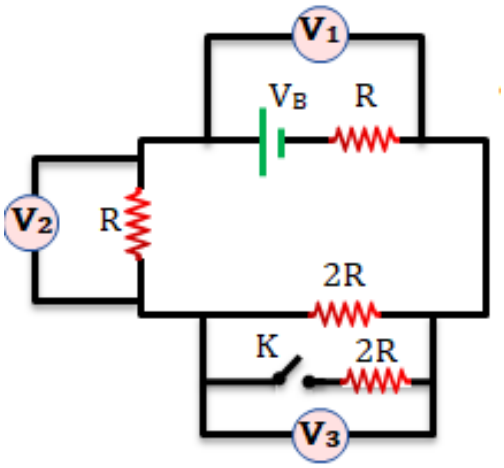
| | | |
|---|---|---|
| 2 | **The figure shows part of a closed electric circuit.**   **Using the data shown, the ratio between** $\frac{Reading\ of\ voltmeter V_1}{Reading\ of\ voltmeter V_2}$ **. =.....** | |
| | **A** | $\frac{1}{2}$ |
| | **B** | $\frac{3}{4}$ |
| | **C** | $\frac{1}{1}$ |
| | **D** | $\frac{2}{3}$ |

**3** The figure represents a closed electric circuit; therefore, the equivalent external resistance of the circuit is equal to...



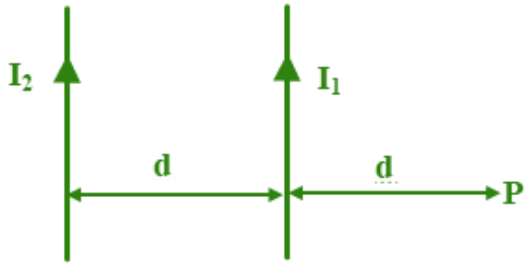

| | |
|---|---|
| **A** | 9 Ω |
| **B** | 6 Ω |
| **C** | 4 Ω |
| **D** | 1 Ω |

**4** The diagram shows a closed electric circuit containing several resistors, a battery with negligible internal resistance, and an opened switch K. What happens to the readings of voltmeters $V_1$, $V_2$, and $V_3$ when switch K is closed?



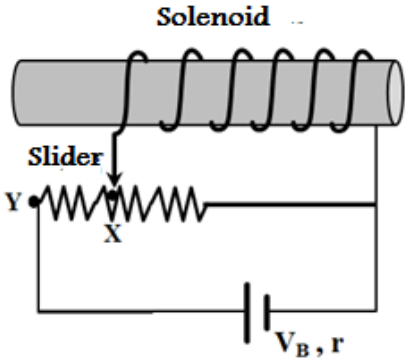

| | ($V_1$) Reading | ($V_2$) Reading | ($V_3$) Reading |
|---|---|---|---|
| **A** | remains constant | increases | decreases |
| **B** | increases | Reduces | increases |
| **C** | decreases | decreases | increases |
| **D** | decreases | increases | decreases |

**5** The figure represents two long, parallel, straight wires. An electric current passes through each of them. When the direction of current flow in one of the two wires is reversed, the total magnetic flux density at the point P decreased to half, then the ratio $\frac{I_2}{I_1}$ is equal.....



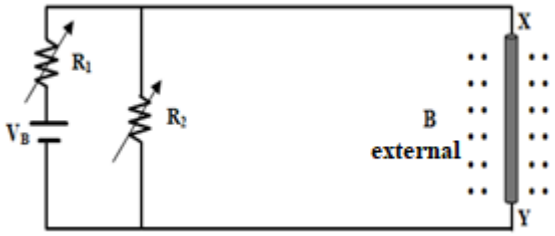

| | |
|---|---|
| **A** | $\frac{2}{3}$ |
| **B** | $\frac{3}{2}$ |
| **C** | $\frac{1}{2}$ |
| **D** | $\frac{2}{1}$ |

**6** In the opposite figure, a solenoid is connected to a battery whose electromotive force is ($V_B$), its internal resistance (r). When moving the slider from position X to position Y, then the magnetic flux density at a point on the midpoint of the solenoid's axis .....




| | |
|---|---|
| **A** | will be increased |
| **B** | will be unchanged |
| **C** | will be decreased but won't be vanished |
| **D** | will be vanished |

**7** In the shown electrical circuit , a metal wire is connected to a closed electrical circuit containing a battery with an electromotive force $V_B$, negligible internal resistance, and two variable resistors ($R_1$) and ($R_2$). The wire is placed in a uniform external magnetic field (B). Which of the following actions causes a decrease in the magnetic force acting on the wire XY?




| | The resistance ($R_1$) | The resistance ($R_2$) |
|---|---|---|
| A | increases | increases |
| B | increases | decreases |
| C | decreases | increases |
| D | decreases | decreases |

**8** The ratio between the magnetic torque($\tau$) that affect on a coil carrying a current placed in a uniform magnetic field of a flux density (B),Where the coil's plane makes an angle 60° with magnetic field lines and the dipole moment ($|\overrightarrow{m_d}|$) When the same coil's plane makes an angle of 30° with the same magnetic field equals.....

| | |
|---|---|
| A | $\frac{B}{\sqrt{3}}$ |
| B | $\sqrt{3}\,B$ |
| C | $\frac{B}{2}$ |
| D | $\frac{\sqrt{3}\,B}{2}$ |

**9** Two galvanometer A and B, pointer of each of them deflects by the same angle when an electric current passes through each of them of value 2 **I** and **I** respectively, then the sensitivity of galvanometer (A) .....the sensitivity of galvanometer (B)

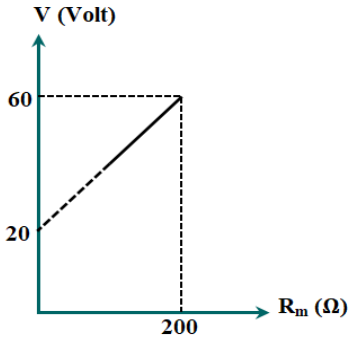
| | |
|---|---|
| **A** | double |
| **B** | half |
| **C** | equal |
| **D** | quarter |

**10** Moving coil galvanometer; its coil resistance R. once connected to a shunt R to form an ammeter (1) and connected again to a shunt of resistance $\frac{R}{3}$ To form an ammeter (2) as shown.

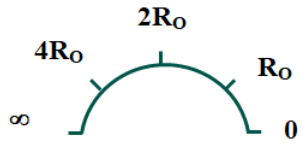
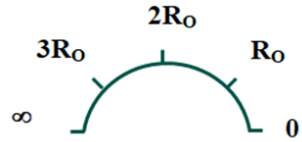
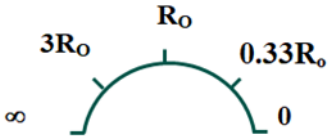
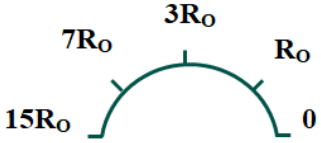

The correct choice represents the angle of deflection of the galvanometer pointer in both galvanometers when the current passes through, as shown in the diagram above.....

| | The angle of deflection of the pointer of the device (1) | The angle of deflection of the pointer of the device (2) |
|---|---|---|
| **A** | θ | 4θ |
| **B** | θ | 2 θ |
| **C** | 2θ | 3θ |
| **D** | 2θ | 2θ |

**11** The graph represents the relationship between the maximum voltage difference to be measured by a voltmeter (V) and a multiplier resistance ($R_m$) whose resistance can be changed. If the used galvanometer in the voltmeter converted into ammeter to measure maximum current 1 A, the value of the shunt that needed to be connected between the terminals of the galvanometer equal.....




| | |
|---|---|
| **A** | 20 Ω |
| **B** | 25 Ω |
| **C** | 50 Ω |
| **D** | 100 Ω |

| | | |
|---|---|---|
| 12 | A simple ohmmeter consisting of a battery of negligible internal resistance and a galvanometer ( $R_g = 0.25\ R_o$) and fixed resistance ($R_c = 0.75\ R_o$), when the two ends of the ohmmeter are touched before the unknown resistance ($R_X$) is placed, the galvanometer gives the maximum deflection. Which of the following figures represents the <u>correct</u> scale for an ohmmeter to measure unknown resistance $R_x$ ( in terms of $R_0$)? | |
| A |  | |
| B |  | |
| C |  | |
| D |  | |

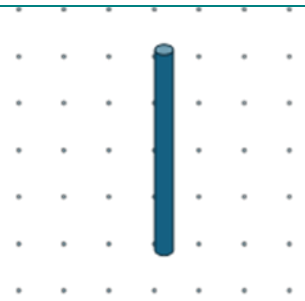
**13** Two metallic rings have the same diameter. and are made of same material, one of them from a thick wire while the other from a thin wire, when moving a magnet Perpendicular to the plane of the two rings with the same speed.

Which of the following choices correctly express the induced current and the induced electromotive force generated in The two rings?

| | generated induced current | generated induced electromotive force |
|---|---|---|
| **A** | Equal in each two rings | Equal in each two rings |
| **B** | Greater in the ring of thick wire | Equal in each two rings |
| **C** | Equal in each two rings | Greater in the ring of thick wire |
| **D** | Greater in the ring of thick wire | Greater in the ring of thick wire |

**14** On increasing the magnetic field passing normally through a fixed metal ring and directed out of the page. The induced current generated in the ring will be.....

| | |
|---|---|
| **A** | perpendicular to the diameter of the ring, outside the page. |
| **B** | along the diameter of the ring. |
| **C** | rotated clockwise. |
| **D** | rotated counterclockwise. |

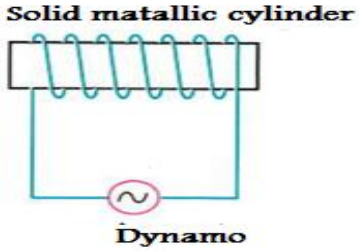
| | | |
|---|---|---|
| 15 | **The figure shows a part of a closed circuit that includes a wire moving normally on a magnetic field direction ,Causing an induced current to flow in the wire**<br>**If the direction of flow electrons thorough the wire is Upward. Then the direction of movement wire is.....** |  |

| | |
|---|---|
| **A** | to the left |
| **B** | to the right |
| **C** | downward |
| **D** | upward |

| | |
|---|---|
| 16 | **A circuit contains an induction coil, a neon lamp, and a switch connected to a DC source. The spark (illumination) of the neon lamp when the circuit is opened is much brighter than when the circuit is closed because.....** |

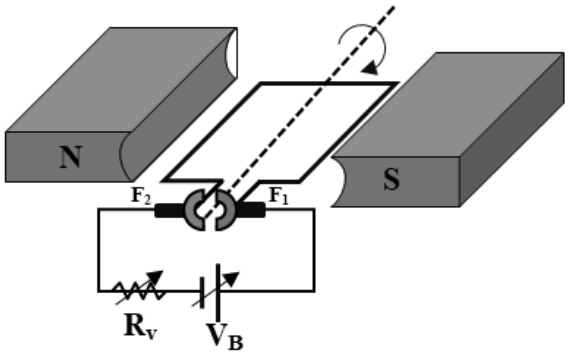
| | |
|---|---|
| **A** | the self-inductance increases when the circuit is opened. |
| **B** | the time it takes for a current to decay is much smaller than its time to grow. |
| **C** | the change in magnetic flux during opening the key is much greater than change in magnetic flux after closing the key |
| **D** | the time rate of change of current during opening is much lower than the time rate of change of current after shutdown |

**17** The figure represents a solenoid its ohmic resistance R, It has a metal core, and the coil is connected to an alternating current generator. Which of the following choices will reduce the temperature of the coil core?



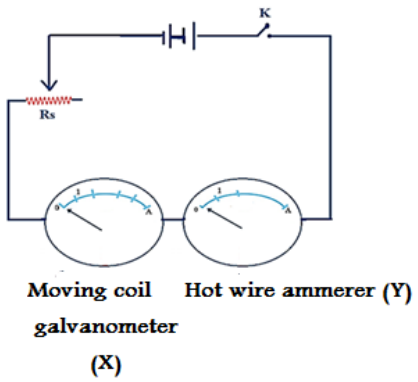

| | |
|---|---|
| **A** | decreasing the frequency of the electric generator (dynamo) |
| **B** | Increasing the frequency of the electric generator (dynamo) |
| **C** | Increasing the number of turns in the generator coil |
| **D** | Replace the generator coil wire with another one that has a higher resistivity. |

**18** The figure shows an electric motor coil connected to battery of a variable electromotive force and a variable resistance ($R_V$), rotates between the two poles of a U-shaped magnet.
What will happen to the average rotation speed of motor after increasing of the electromotive force only and another time after increasing the variable resistance only?




| | Increasing variable resistance ($R_v$) | Increasing electromotive force ($V_B$) |
|---|---|---|
| A | The speed increases | The speed decreases |
| B | The speed increases | The speed increases |
| C | The speed decreases | The speed decreases |
| D | The speed decreases | The speed increases |

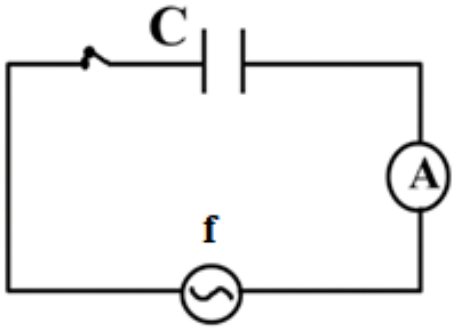
| | | |
|---|---|---|
| 19 | A non-ideal voltage step-down transformer consists of two coils, primary and secondary. If the efficiency of the transformer is 90%, which of the following statements is correct? | |
| | **A** | The current passing through the secondary coil = $\frac{1}{10}$× the current passing through the primary coil. |
| | **B** | The electromotive force of the secondary coil = $\frac{10}{9}$× the electromotive force of the primary coil. |
| | **C** | The number of turns in the secondary coil = $\frac{10}{9}$ × the number of turns in the primary coil. |
| | **D** | The electrical power lost inside the transformer = $\frac{1}{10}$× the electrical power supplied to the primary coil. |

| | | |
|---|---|---|
| 20 | In the electric circuit shown, when the switch K is closed and a current of 1A is pass, the pointers of the two ammeters (x, y) will deflect at equal angles. Then, when a current of 2A is pass, the pointer of the moving-coil ammeter (x) will deflect from its previous position (by angle θ). The pointer of the hot wire ammeter (y) will deflect by an angle equal to ..... from its previous position   | |
| | **A** | θ |
| | **B** | 2 θ |
| | **C** | 3 θ |
| | **D** | 4 θ |

**21**

**In the circuit shown, a capacitor with a capacitance of (C) connected to an AC dynamo of frequency (f) and a hot wire ammeter with negligible ohmic resistance such that the reading of the hot wire ammeter was (I)**

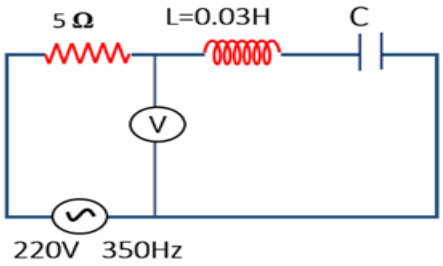
**The <u>correct</u> action that leads to increase the hot wire ammeter reading to (2I) is .....**




| | |
|---|---|
| **A** | Increasing the frequency of the dynamo coil to (2 f). |
| **B** | Reduce the frequency of the dynamo coil to $(\frac{1}{2})f$. |
| **C** | Connecting a capacitor with a capacitance (C) in series with the existing capacitor. |
| **D** | Connecting a capacitor with a capacitance (C) in parallel with the existing capacitor. |

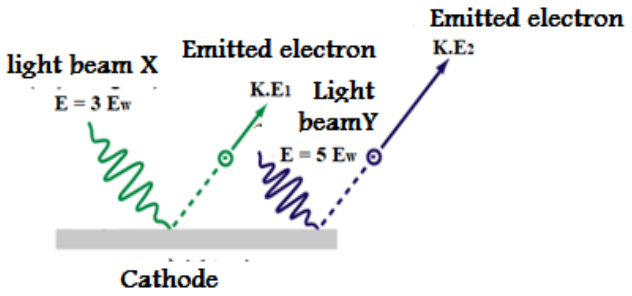
**22**

**In the electric circuit shown, to make total voltage and the current are in phase , the value of the capacitance of the capacitor and voltmeter reading should be ..... and ..... respectively.**




| | |
|---|---|
| **A** | 220 V, 6.9 μF |
| **B** | Zero, 17.4μF |
| **C** | Zero, 6.9μF |
| **D** | 220 V, 17.4 μF |

**23** The figure shows the incident of two monochromatic light beams (X) and (Y) on the cathode of a photoelectric cell, and the work function of the cathode material is $E_w$.




**Which of the following statements is <u>correct</u> ?**

| | |
|---|---|
| **A** | The maximum kinetic energy of the first electron is double the maximum kinetic energy of the second electron |
| **B** | The maximum kinetic energy of the first electron equals the maximum kinetic energy of the second electron |
| **C** | The maximum velocity of the first electron is $\frac{1}{\sqrt{2}}$ the maximum velocity of the second electron |
| **D** | The maximum velocity of the first electron $\sqrt{2}$ the maximum velocity of the second electron |

**24** **Two photons A and B, if the energy of photon A is 8 eV and the ratio of the momentum of photon A to the momentum of photon B is $\frac{2}{3}$ ,then the energy of photon B is given by.....**

| | |
|---|---|
| **A** | 5.33 eV |
| **B** | 12 eV |
| **C** | 24 eV |
| **D** | 16 eV |

**25** The table shows the mass and speed of four particles

| particle | The mass | speed |
|---|---|---|
| The first | 2 m | 2v |
| The second | m | 3v |
| The third | 4 m | v |
| The fourth | 3 m | 3v |

The correct relationship between wavelengths associated with particles motion is .....

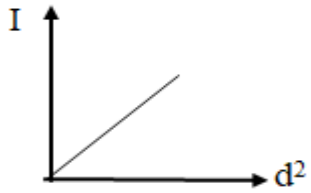
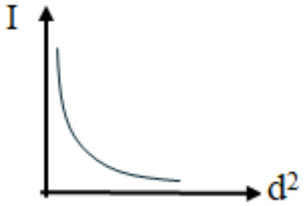
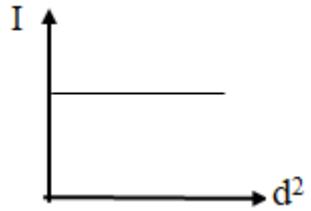
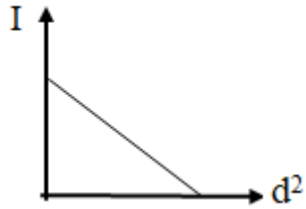
| | |
|---|---|
| **A** | $\lambda_1 = \lambda_4 > \lambda_2 > \lambda_3$ |
| **B** | $\lambda_1 = \lambda_2 > \lambda_4 > \lambda_3$ |
| **C** | $\lambda_2 > \lambda_1 = \lambda_3 > \lambda_4$ |
| **D** | $\lambda_1 > \lambda_4 = \lambda_2 > \lambda_3$ |

**26** The figure represents the standing wave associated with the movement of an electron in a hydrogen atom at one of the atom's energy levels. If the radius of the orbit in which the electron revolves is. r.

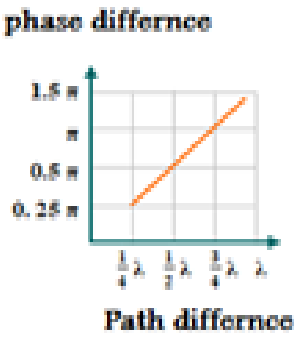
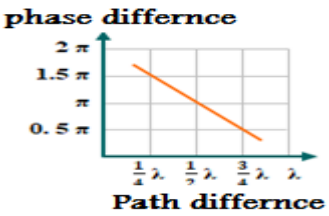
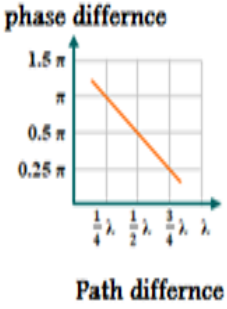
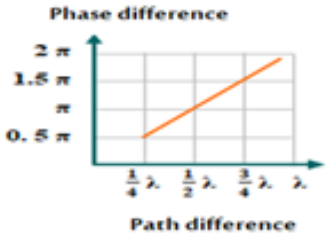

The wavelength of the standing wave associated with the electron's motion is given by the relationship.....

| | |
|---|---|
| **A** | $\lambda = \frac{2\pi r}{3}$ |
| **B** | $\lambda = \frac{3\pi r}{2}$ |
| **C** | $\lambda = \frac{3\pi r}{4}$ |
| **D** | $\lambda = \frac{\pi r}{2}$ |

| 27 | In the spectrum of the hydrogen atom, the ratio between the shortest wavelength in the Balmer series and the shortest wavelength in the Lyman series is equal to ..... |
|---|---|
| **A** | 0.25 |
| **B** | 0.5 |
| **C** | 2 |
| **D** | 4 |

| 28 | Which of the following graphs represents the relationship between the intensity of ordinary light rays (I) and the square of the distance ($d^2$) that is covered by the light rays from the source? |
|---|---|
| **A** |   |
| **B** |   |
| **C** |   |
| **D** |   |

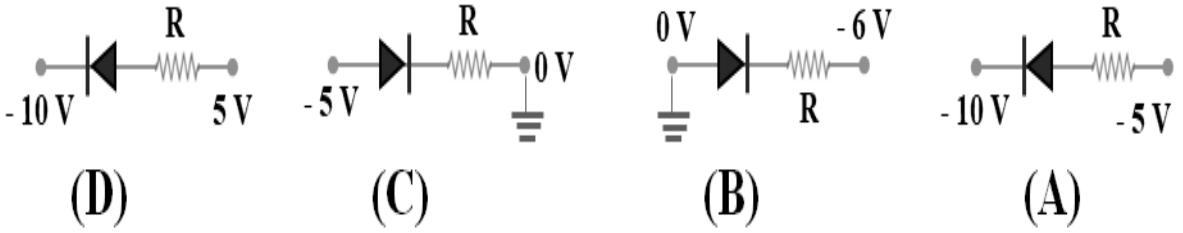
| | | |
|---|---|---|
| 29 | **The population inversion process for occurrence of a helium-Neon laser the number of neon atoms in higher excited levels must be ..... the number of neon atoms in the lower excited levels.** | |
| | **A** | greater than |
| | **B** | smaller than |
| | **C** | equal |
| | **D** | half |

| | |
|---|---|
| 30 | Which of the following graphs represents the relationship between phase differences Between two laser beams after their reflection from the body and the path difference Between the two reflected waves? |
| A |   |
| B |   |
| C |   |
| D |   |

| | |
|---|---|
| 31 | When a germanium crystal is doped with an element that has fewer electrons in its outer energy level than the germanium atom has, so the majority charge carriers are ..... |

| | |
|---|---|
| **A** | electrons |
| **B** | holes |
| **C** | positive ions |
| **D** | negative ions |

| | |
|---|---|
| 32 | Which of the following figures illustrates the reverse bias of pn junction (diode)? |

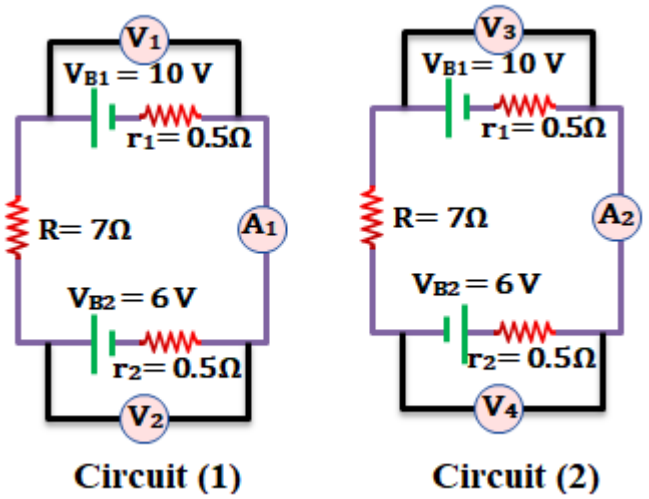



| | |
|---|---|
| **A** | Figure (A) |
| **B** | Figure (B) |
| **C** | Figure (C) |
| **D** | Figure (D) |

## Second, objective questions (multiple choice) "Each question two marks"

33

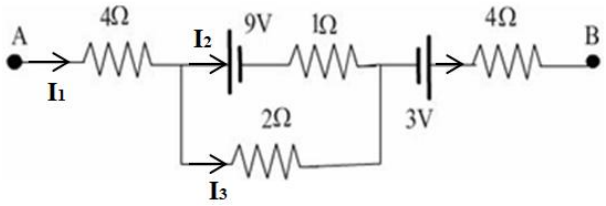
Using the data shown on circuits (1) and (2).




Which of the following choices is correct?

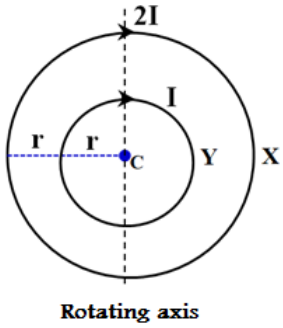
| | The relation between $A_1$ and $A_2$ | The relation between $V_1$ and $V_3$ | The relation between $V_2$ and $V_4$ |
|---|---|---|---|
| **A** | $A_1 > A_2$ | $V_1 < V_3$ | $V_2 < V_4$ |
| **B** | $A_1 > A_2$ | $V_1 > V_3$ | $V_2 > V_4$ |
| **C** | $A_1 < A_2$ | $V_1 < V_3$ | $V_2 < V_4$ |
| **D** | $A_1 < A_2$ | $V_1 > V_3$ | $V_2 > V_4$ |

**34** The shown figure represents a part of a closed electric circuit, if the potential difference between the two points A and B equal 16 V ( $V_A - V_B = 16$ V), so the intensity of the current passing through the resistor 2 Ω will be equal .....




| | |
|---|---|
| **A** | 2.5 A |
| **B** | 3.5 A |
| **C** | 4 A |
| **D** | Zero |

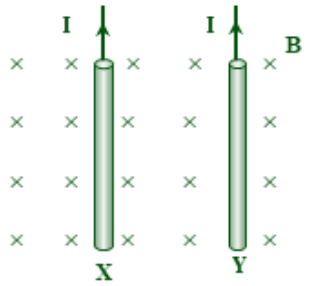
**35** The opposite figure shows two metal rings (X and Y) are in the same plane, have a common center (C). An electric current passes through each of them.
its intensity (I) through the ring (Y) and its intensity (2I) through the ring ((X), some changes were made to them separately as follows:
I- Increasing the intensity of the current passing through the ring Y to 2I
II- Reverse the direction of current flow in the ring X
III- Rotating the Y-ring at a 180° About the axis of rotation
Which of the pervious actions leads to .....?




| | Increasing magnetic flux density at C | vanishing of magnetic flux density at C |
|---|---|---|
| **A** | II | I |
| **B** | II | I and III |
| **C** | I | II and III |
| **D** | III | I and II |

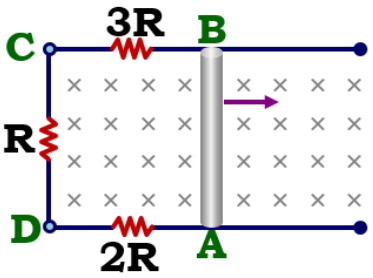
**36** The figure opposite shows two long, straight, parallel wires (X) and (Y), placed n in a uniform external magnetic field of density B.

The ratio between the magnetic force acting on the two wires (X) and Y respectively are $\frac{Fx}{Fy}$ *is* ... ... ... .



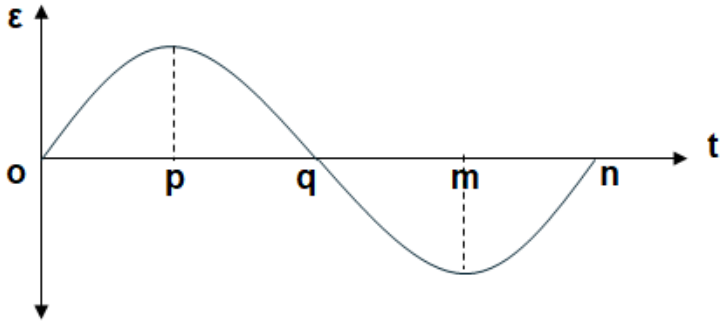

| | |
|---|---|
| **A** | Greater than one |
| **B** | Smaller than one |
| **C** | equal One |
| **D** | It may be greater than or less than one. |

**37** The figure represents an electric conductor (AB) that is moving in a magnetic field in the shown direction. Which of the following statements correctly describes the relation between the electric potential of the four points A, B, C and D?




| | |
|---|---|
| **A** | A > B > C > D |
| **B** | B > C > D > A |
| **C** | C > D > A > B |
| **D** | D > A > B > C |

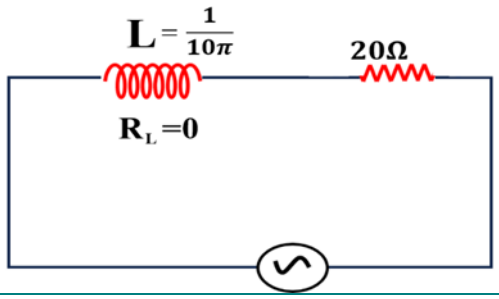
38 **The following graph illustrates the relationship between the instantaneous induced electromotive force (ε) generated in the coil of an alternating current dynamo during a complete cycle.**




**The time period during which the average induced electromotive force (emf)during the rotation of the dynamo coil is equal to its value during the period (op) is .....**

| | |
|---|---|
| **A** | during the period(pm) |
| **B** | during the period(om) |
| **C** | during the period(on) |
| **D** | during the period (qn) |

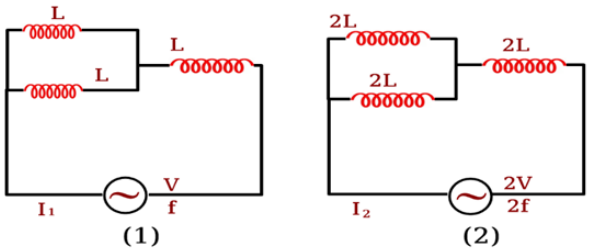
**39** The figure shows an alternating current circuit (RL) in series , if the potential difference across the coil is twice as the potential difference across the resistor, then the frequency of the source is equal to.....




| | |
|---|---|
| **A** | 10 Hz |
| **B** | 20 Hz |
| **C** | 50 Hz |
| **D** | 200 Hz |

**40** In the two circuits shown in the figure, the ohmic resistance of the coils and the mutual induction between them are neglected,

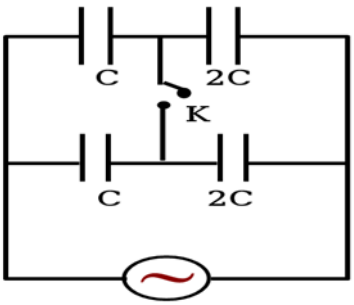
then the ratio $\frac{I_1}{I_2}$ =.....




| | |
|---|---|
| **A** | $\frac{1}{1}$ |
| **B** | $\frac{2}{1}$ |
| **C** | $\frac{1}{2}$ |
| **D** | $\frac{4}{1}$ |

**41** The figure represents an AC circuit containing several capacitors , an open switch K and an alternating current source,

When switch K is closed, the current flowing through the circuit will be.....

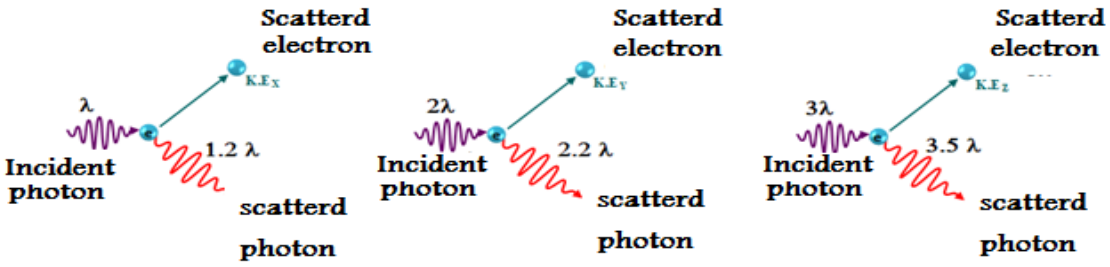



| | |
|---|---|
| **A** | doubled |
| **B** | halved |
| **C** | unchanged |
| **D** | increased to 4 times |

**42** In an electron microscope, if you know that the wavelength associated the motion of the electron beam equals $\lambda$ ,When the potential difference between the cathode and the anode equal V. If the wavelength associated the beam becomes $0.5\lambda$, so the potential difference used to accelerate the electron beam.....

| | |
|---|---|
| **A** | increases by 4V |
| **B** | decreases to $\frac{1}{4}V$ |
| **C** | increases to $\sqrt{2}$ V |
| **D** | increases by 3 V |

**43** The following diagrams represent a photoncollides with a free (stationary) electron

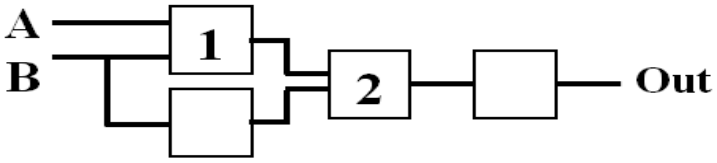



What is the relations between the kinetic energy of the scattered electron in each of the three cases?

| | | |
|---|---|---|
| **A** | $K.E_X > K.E_Y = K.E_Z$ | |
| **B** | $K.E_Y > K.E_Z > K.E_X$ | |
| **C** | $K.E_Y > K.E_X > K.E_Z$ | |
| **D** | $K.E_X > K.E_Z > K.E_Y$ | |

**44** In the diagram: Four unknown logic gates,

| A | B | Out |
|---|---|---|
| 0 | 1 | 1 |
| 1 | 1 | 0 |



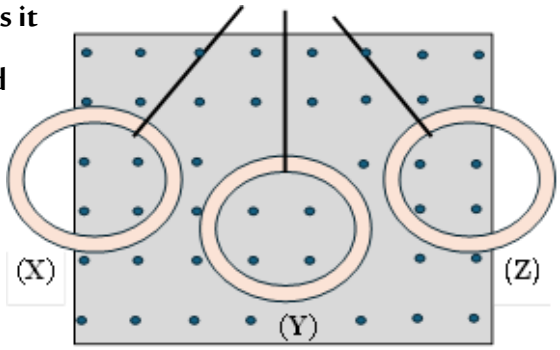

From the truth table the correct choice representing gates (1) and (2)

| | Gate (1) | Gate (2) | |
|---|---|---|---|
| **A** | OR | AND | |
| **B** | AND | OR | |
| **C** | OR | OR | |
| **D** | AND | AND | |

## Third, essay questions: each question two marks.

45

A metal ring suspended by a string oscillates as it passes through a uniform magnetic field perpendicular to its plane outwards, starting from position (X) to position (Z) passing through position (Y), as shown in the figure.




(A) Why does the induced electric current in the loop disappear when it passes through the position (Y)?

(B) Determine the direction of the induced current in the loop at the two positions (X), (Z).

46

In Coolidge tube that produces X-rays, on increasing the number of electrons emitted from the filament,

What will happen to each of the following..... (With explanation)?

1- The difference between the shortest wavelength in case of continuous spectrum and the shortest wavelength in case of characteristic spectrum.

2- Intensity of the resulting X-rays .