Training exams for third secondary

Physics- English

Model (5)- English

2025-2026

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

1

Four copper wires X, Y, Z, and W at same temperature. Their lengths and cross-sectional areas are listed in the following table.

The wire	Its length	Its cross-sectional area
X	ℓ	A
Y	2ℓ	A
Z	ℓ	2A
W	2ℓ	2A

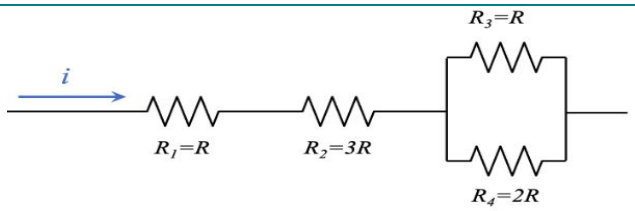
Which two wires have the ratio between their electric resistance equal to $\frac{4}{1}$?

A	Wires X and Z
B	Wires X and W
C	Wires Y and W
D	Wires Y and Z

2

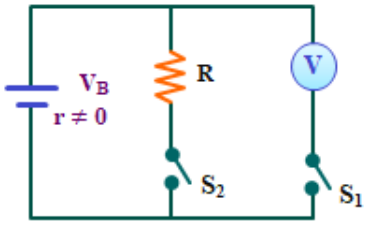
The figure represents a part of an electric circuit with four resistances R_1, R_2, R_3, R_4 and a current intensity I.

Which of the following statements is correct?



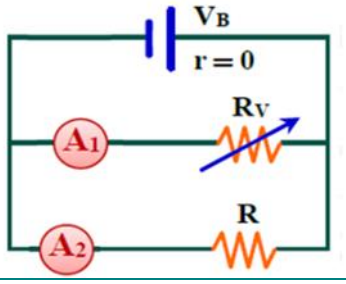
A	The current intensity passing through resistance R_1 is equal to that passing through resistance R_3.
B	The current intensity passing through resistance R_2 is three times that passing through resistance R_4.
C	The potential difference across resistance R_2 is three times that across resistance R_3.
D	The potential difference across resistance R_1 is equal to that across resistor R_4.

3 In the electric circuit shown in the figure, a battery of electromotive force (V_B), of internal resistance (r), a fixed resistor R, a voltmeter (V), and two switches S_1 and S_2.
When the two switches S_1 and S_2 are closed together,
the reading of voltmeter (V) is equal to. .....



A	V_B
B	Ir
C	V_B - IR
D	V_B - Ir

4 In the electric circuit shown in the figure, a battery of electromotive force (V_B) of negligible internal resistance. When the value taken from the variable resistor is decreased, the reading of each ammeter (A_1, A_2) will.....



	reading of ammeter (A_1)	reading of ammeter (A_2)
A	increase	remain constant
B	increase	decrease
C	remain constant	increase
D	decrease	remain constant

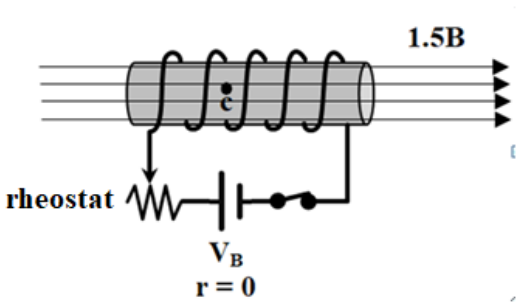
5

Two long straight parallel wires, each carrying a direct electric current of intensity I in opposite directions, the total magnetic flux density at midpoint between the two wires is B. If the distance between the two wires is halved,
in order to keep the total magnetic flux density at midpoint between the wires is B, we should.....

A	increase the current intensity passing through each wire to four times its original value.
B	increase the current intensity passing through each wire to twice its original value.
C	decrease the current intensity passing through each wire to half its original value.
D	decrease the current intensity passing through each wire to a quarter of its original value.

6

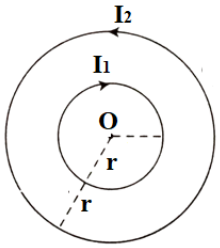
In the shown figure:
A solenoid connected to a battery of electromotive force V_B, of negligible internal resistance, and a rheostat. A magnetic field of flux density of B is produced and placed in an external magnetic field of flux density of 1.5B directed to the right of the page.



When the resistance taken from the rheostat is increased by one third, the flux density at point C will.....
(Assuming the resistance of the solenoid's wire is negligible)

A	increase
B	decrease
C	remain constant
D	become zero

7 Two concentric metal circular rings of their center (O), lie in the same plane, each carrying an electric current as shown in the figure. If the magnetic flux density of the outer ring is three times that of the inner ring at the center (O), then the ratio $\frac{I_2}{I_1}$ is equal to.....



A	$\frac{3}{1}$
B	$\frac{6}{1}$
C	$\frac{3}{2}$
D	$\frac{5}{1}$

8 The two figures (1) and (2) show two long straight wires, with lengths (ℓ) and (2ℓ) respectively. A DC electric current of intensity I passes through each of them, and each is placed in a uniform magnetic field of flux density (3B) and (B) respectively.

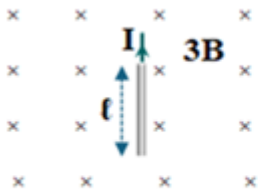


figure (1)

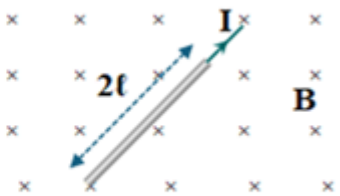


figure (2)

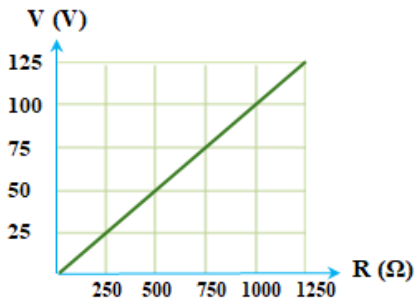
Which of the following <u>statements correctly expresses</u> the relation between the magnetic forces acting on the two wires?

A	$F_1 = \frac{F_2}{2}$
B	$F_1 = \frac{2F_2}{3}$
C	$F_1 = \frac{3F_2}{2}$
D	$F_1 = 2F_2$

9 Two long parallel wires X and Y , each is connected to a battery of negligible internal resistance; the mutual force between them is (F). When wire X is replaced by another wire of the same length and radius but has electric conductivity five times that of wire X, the mutual force between the two wires becomes.....

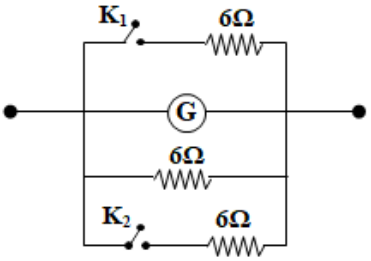
A	$\frac{F}{4}$
B	$\frac{F}{5}$
C	4 F
D	5 F

10 A sensitive galvanometer of coil's resistance is (R_g), used to measure a current of maximum intensity (I_g). When it connected to multiplier resistance (R_m) whose resistance can be changed to convert it into a voltmeter in each time. The graph shows the relation between the maximum potential difference (V) that can be measured by the voltmeter and the total resistance of the voltmeter (R). the value of I_g is .....



A	0.1 A
B	0.2 A
C	0.25 A
D	0.5 A

11 The figure represents a galvanometer (G) converted into an ammeter. If you know that the resistance of the galvanometer's coil is $R_g = 18\Omega$, then the ratio between the sensitivity of the device before and after closing K_1 and K_2 together is equal to.....



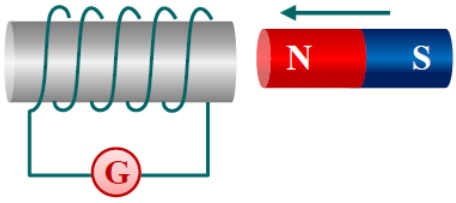
A	$\frac{2}{5}$
B	$\frac{5}{2}$
C	$\frac{7}{4}$
D	$\frac{4}{7}$

12 When connecting a moving-coil galvanometer to a suitable DC source.
Which of the following choices correctly expresses the change that occurs in both the magnetic torque acting on the coil and the torsion torque produced by pair of spiral springs from the moment that the pointer moves on the scale until it stabilizes at a certain reading?

	the magnetic torque acting on the coil	the torsion torque produced by pair of spiral springs
A	increases	increases
B	increases	remains constant
C	remains constant	increases
D	remains constant	remains constant

13

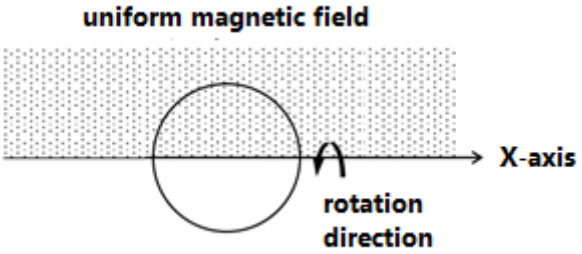
A magnet moves at a certain speed toward a solenoid, as shown in the figure. An induced electromotive force (ε) is produced in the solenoid, and the sensitive galvanometer pointer (G) deflects at an angle (θ). When the galvanometer is replaced by another one of the same scale and has smaller resistance, and if the same magnet moves at the same speed toward the same coil,

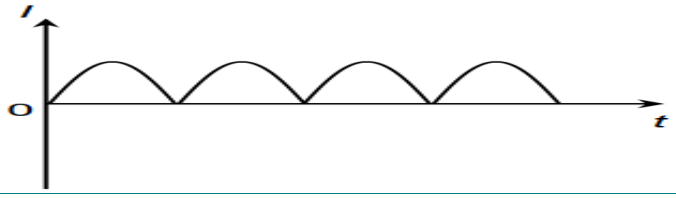


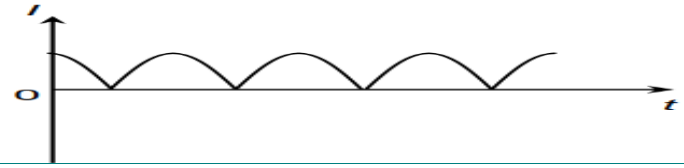
then, the induced electromotive force in the coil and the deflection angle of the galvanometer pointer will be .....

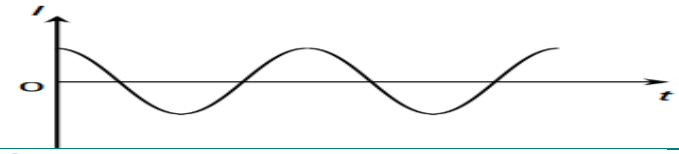
	induced electromotive force in the coil	deflection angle of the galvanometer pointer
A	Became greater than ε	Became greater than θ
B	Remain ε	Became greater than θ
C	Became greater than ε	Remain θ
D	Remain ε	Remain θ

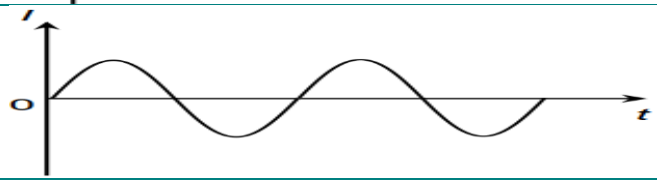
14 The opposite figure shows a circular coil of one turn in the plane of the page, half of the coil lying in a uniform magnetic field directed out of the page. The coil rotates at a constant speed from the vertical position about the x-axis. Which of the following graphs correctly describes the change in induced current I in the coil with time t?



A 

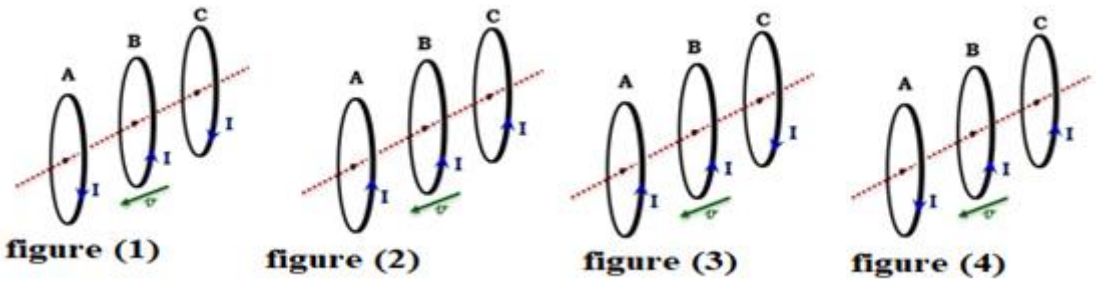
B 

C 

D 

15

A, B, C Three conducting rings , ring B carries a current and moves at speed v as shown in the following figures.



The figure that shows the correct direction of the induced current produced in the other rings (A, C) is.....

A	Figure (1)
B	Figure (2)
C	Figure (3)
D	Figure (4)

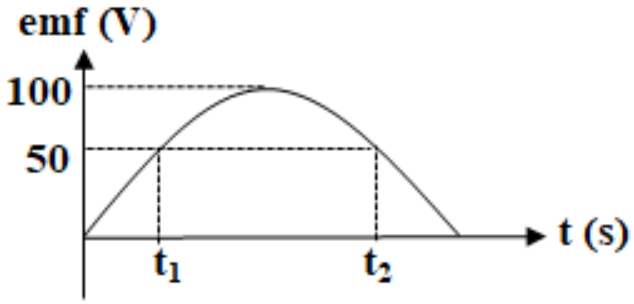
16

The following table shows the magnetic permeability coefficient, length of the solenoid, and number of the turns for two solenoids X and Y of the same cross-sectional area.

	Solenoid X	Solenoid Y
magnetic permeability coefficient	10μ	μ
length of the solenoid	ℓ	2ℓ
number of turns	N	2N

Then the self-inductance of the solenoid X is.....

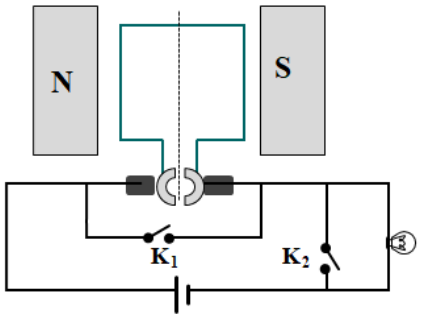
A	1.25 × the self-inductance of the solenoid Y
B	2.5 × the self-inductance of the solenoid Y
C	5 × the self-inductance of the solenoid Y
D	10 × the self-inductance of the solenoid Y

17	**The graph shows the relation between the instantaneous induced electromotive force (emf) generated in AC dynamo coil and time (t).** **The average electromotive force during the time interval from (t_1) to (t_2) is approximately equal to....**	

A	82.7 V
B	87 V
C	90 V
D	95.5 V

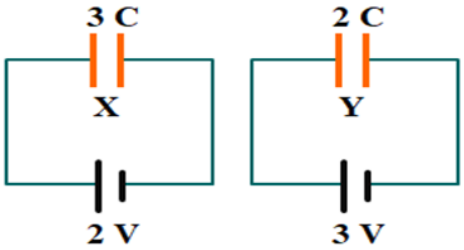
18	**In a non-ideal step-down transformer, the ratio between the number of turns of its coils was 1:2, so .....**	
A	the current frequency through the secondary coil is twice that through the primary coil.	
B	the current intensity passing through the secondary coil is twice that passing through the primary coil.	
C	the potential difference between ends of the secondary coil is twice that between ends of the primary coil	
D	the output power at the secondary coil is twice the input power at the primary coil.	

19 **The diagram shows a simplified diagram of an electric motor coil that starts to rotate from a position in which it is placed parallel between two flat magnetic poles, so that the coil is connected to a battery, an electric bulb, and two open switches, K_1 and K_2. Which of the following is true when switches (K_1) and (K_2) are turned off individually?**



	When K_1 is closed only	When K_2 is closed only
A	The bulb will turn off and speed of the motor will decrease	The motor will stop and the illumination of the bulb will increase
B	The bulb will turn off and speed of the motor will decrease	The bulb will turn off and speed of the motor will increase
C	The motor will stop and the illumination of the bulb will increase	The motor will stop and the illumination of the bulb will increase
D	The motor will stop and the illumination of the bulb will increase	The bulb will turn off and speed of the motor will increase

20 **The figure shows two electric circuits (X, Y). In each circuit, a capacitor is connected to a battery.**



The ratio between $\dfrac{\text{the charge stored on one of plales of capacitor X } (Q_X)}{\text{the charge stored on one of plales of capacitor Y } (Q_Y)} = \cdots$

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

21	**A radio receiver circuit picks up a radio wave with a frequency (f). On increasing the capacitance of the capacitor in the circuit to double, the circuit is unable to receive this radio wave.** **What change should be done to the circuit to receive this wave clearly again?**	
	A	Increase the self-inductance of the coil to double its value.
	B	Decrease the self-inductance of the coil to its half value.
	C	Decrease the self-inductance of the coil to its quarter of value.
	D	Increase the self-inductance of the coil to four times its value.

22	**Two LC oscillating circuits (X, Y) were adjusted to the same resonance frequency, where resistance of the circuit wires X was R_X and resistance of the circuit wires Y was R_Y. If the damping of the charge on plates of the capacitor in circuit (X) is faster than that on plates of the capacitor in circuit (Y),** **The choice that correctly expresses the relation between resistors R_X and R_Y is.....**	
	A	$R_X > R_Y$
	B	$R_X = R_Y$
	C	$R_X < R_Y$
	D	$R_X = 0.5\ R_Y$

23 Two glowing bodies (x, y) are made of the same material and having the same surface area, with temperatures of 2000 K and 6000 K, respectively, produce thermal radiation. If the frequencies at maximum radiation intensity for each of them are ν_x and ν_y, respectively, then the ratio between $\frac{\nu_x}{\nu_y}$ is equal to .....

A	$\frac{1}{3}$
B	$\frac{3}{1}$
C	$\frac{3}{4}$
D	$\frac{4}{3}$

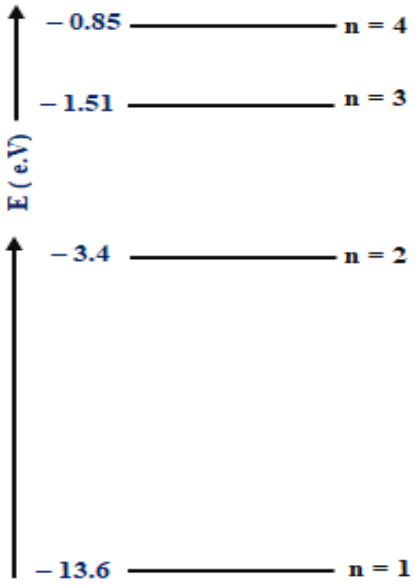
24 In a photoelectric cell, when a yellow light beam of wavelength (λ) from an electric lamp of power 50W falls on a cesium cathode, photoelectrons are emitted from the cathode surface. If the speed of the emitted electrons is equal to ν. When the lamp is replaced by another one of power 100W and a wavelength (λ), so the speed of the emitted electron and the rate of electron emission ..... and .....

	the speed of the emitted electron	the rate of electron emission
A	increases to 2ν	increases to double
B	remains ν	remains constant
C	remains ν	increases to double
D	increases to 2ν	remains constant

25	**Two particles (x, y), mass of particle (x) is double that of particle (y), and particle (y) moves at a speed equal to three times that of particle (x). If the wavelength associated with the motion of particle (x) is 6 nm, then the wavelength associated with the motion of particle (y) is.....**	
	A	12 nm
	B	6 nm
	C	8 nm
	D	4 nm

26

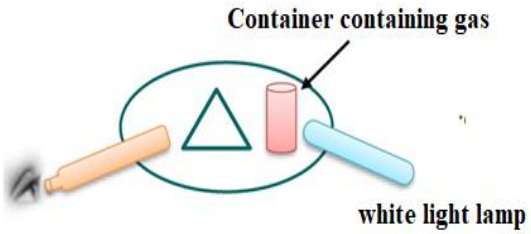
The figure shows a diagram of the energy levels of a hydrogen atom excited in the fourth energy level.
From the figure.....
(known that: h = 6.625 × 10^{-34} J.s ، c = 3 × 10^{8} m/s)



A	the lowest frequency of photons that the atom can emit in this state in the visible light region
B	the highest frequency of photons that the atom can emit in this state is 1.6 × 10^{14} hz
C	the shortest wavelength of visible light photons that the atom can emit in this state is 486.27 nm
D	the shortest wavelength of photons that the atom can emit in this state in the infrared region

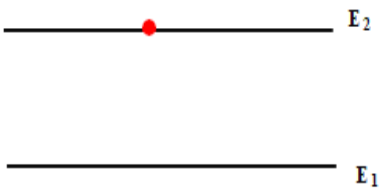
27

At looking through the eyelens of the spectrometer shown in the figure,
the resulting spectrum is.....



A	a colored lines on a dark background.
B	a dark lines on a bright background
C	a bright background containing all wavelengths within a certain range.
D	a dark background without any wavelength.

28 The figure shows an excited atom whose lifetime has not ended at the E_2 excited level.
Which of the following choices correctly expresses the stimulated emission of that atom in terms of.....?



	Energy of the photon required to cause stimulated emission	Number of emitted photons from the stimulated emission
A	$E_2 - E_1$	One photon
B	$E_2 - E_1$	Two photons
C	$E_2 + E_1$	One photon
D	$E_2 + E_1$	Two photons

29 In 3 D imaging (holography) of an object using a laser beam, the phase difference between the reference and reflected beams is $(\frac{2\pi}{5})$ and the path difference between the beams is 1266 Å.
The wavelength of the laser beam used is .....

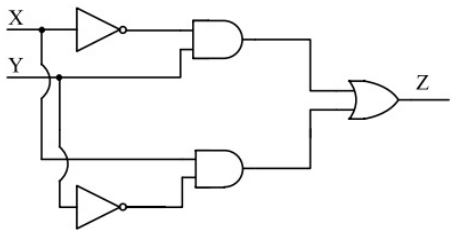
A	4820 Å
B	6330 Å
C	7800 Å
D	3520 Å

30 Which of the following represents the correct choice for the exciting process for both helium and neon atoms to produce laser beam in a He-Ne laser?

	Helium atoms (He)	Neon atoms (Ne)
A	Optical energy	Elastic collision with excited helium atoms
B	Optical energy	Inelastic collision with excited helium atoms
C	Electric energy	Elastic collision with excited helium atoms
D	Electric energy	Inelastic collision with excited helium atoms

31 The circuit in front of you represents a set of logic gates connected together to perform a specific function.

The truth table for the electronic circuit shown in the figure is.....



A

X	Y	Z
0	0	1
0	1	0
1	0	0
1	1	1

B

X	Y	Z
0	0	0
0	1	1
1	0	0
1	1	1

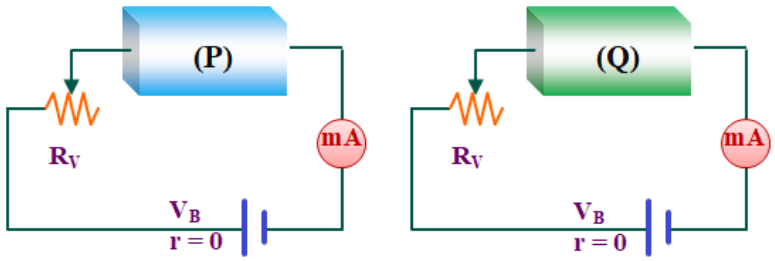
C

X	Y	Z
0	0	1
0	1	0
1	0	1
1	1	0

D

X	Y	Z
0	0	0
0	1	1
1	0	1
1	1	0

32 The figure shows two different crystals (P and Q), one of them is crystal P for a pure semiconductor, and the other is crystal Q for a metallic conductor. On increasing the taken resistance from R_V, the ammeter reading decreases.



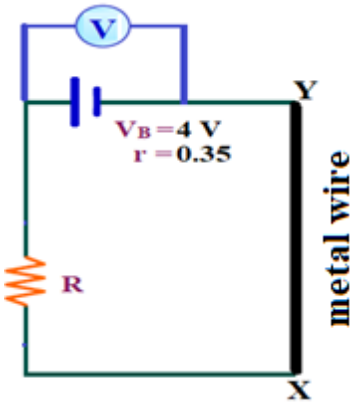
Which of the following actions causes the reading of ammeter to return to the original case?

A	Increase the temperature of P and decrease the temperature of Q.
B	Increase the temperature of Q and decrease the temperature of P.
C	increase the temperature of both P and Q.
D	decrease the temperature of both P and Q.

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

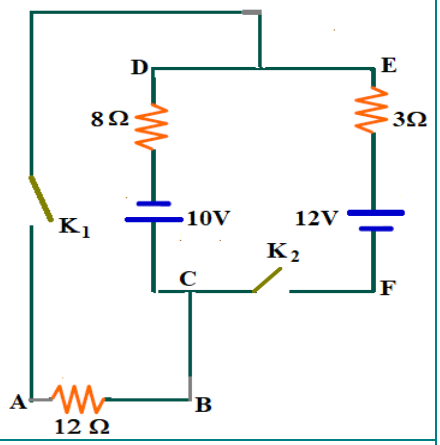
33 The figure shows an electric circuit consisting of a battery of electromotive force 4V and of an internal resistance 0.35 Ω connected to a fixed resistance (R) and a metal wire (XY) with a length of 90 cm and a cross-sectional area of 3×10^{-8} m^2. If the reading of voltmeter is 3.3 V, while the potential difference between the two points X and Y is 1.8 V,

then .....



	The value of equivalent resistance	The electric conductivity of wire XY material
A	1.65 Ω	33.33×10^6 $\Omega^{-1}.m^{-1}$
B	0.9Ω	33.33×10^6 $\Omega^{-1}.m^{-1}$
C	1Ω	3×10^8 $\Omega^{-1}.m^{-1}$
D	0.75 Ω	3×10^8 $\Omega^{-1}.m^{-1}$

34 **Using the given data on the electric circuit in the figure, when switch K_1 is closed only, the potential difference between points B and D is equal to ..... , while when switch K_2 is closed only, the potential difference between points D and F is equal to ..... ,**



	potential difference between points B and D at closing K_1 only	potential difference between points D and F at closing K_2 only
A	14 V	6V
B	6V	16V
C	6V	6 V
D	26V	18V

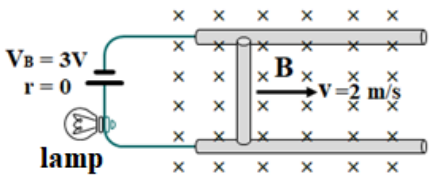
35 **An ohmmeter contains a galvanometer that measures a maximum current of Ig. If you know that its pointer deflects to ¾ Ig when an external resistance of R is connected between its two terminals,**
Which of the following represents the current passing through the circuit when another additional resistance of R is connected in parallel with the previous external resistance?

A	$\frac{6}{8}$ Ig
B	$\frac{3}{8}$ Ig
C	$\frac{6}{7}$Ig
D	$\frac{3}{7}$Ig

36	Two coaxial solenoids coils (wound around an iron core) have the same length , number of turns of each is 200 turns , and each with an area of 4 cm^2. If the current in one of them changes at a rate of 25 A/s, an induced electromotive force of 2 V is generated in the second coil. The length of one coil is ..... (Note that the magnetic permeability coefficient of iron = $2 \times 10^{-3} T.m/A$)

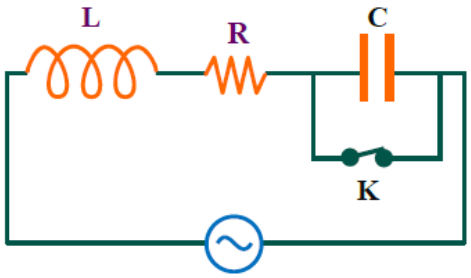
A	0.03 m
B	0.4 m
C	2.5 m
D	20 m

37	The figure shows a frictionless U-shaped metal frame of negligible resistance, connected to an electric lamp of resistance of 3 Ω and a battery of 3 V and of negligible internal resistance. If the conductor of 40 cm long has a resistance of 1 Ω, moves at a constant speed of 2 m/s in the direction shown in a uniform magnetic field of flux density B perpendicular to plane of the frame, it is noticed that the consumed electric power by the lamp is 1.92 W, then the value of B is.....



A	0.2T
B	0.25T
C	0.3T
D	0.35T

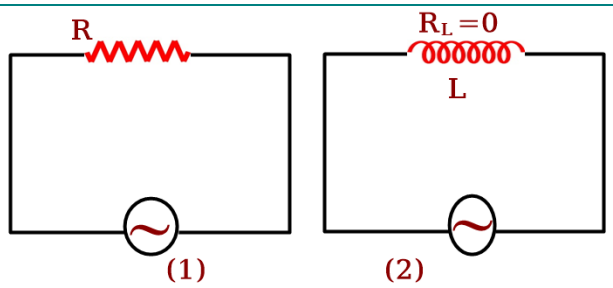
38 The electric circuit is an RLC circuit whose components are connected in series to an alternating current source with frequency f. When the switch is closed, the total voltage leads the current by an angle of (45°), and when the switch is open, the total voltage lags the current by an angle of (45°).



The capacitive reactance of the capacitor is equal to.....

A	0.5R
B	R
C	2R
D	4R

39 In the two circuits 1 and 2, each an ohmic resistance and a pure inductor separately is connected to an AC power source with a constant maximum voltage.



When frequency of the source is increased in both circuits, the value of the current passing in each circuit.....

	Circuit (1) (R circuit)	Circuit (2) (L circuit)
A	remains constant	increases
B	remains constant	decreases
C	decreases	remains constant
D	increases	remains constant

40 In a RLC circuit, its components are connected in series. If $R = X_L = 2X_C$, then the impedance of the circuit and the phase difference between the total voltage V and the current I will be, respectively, ...

	Impedance of the circuit	the phase difference between the total voltage V and the current I
A	$\sqrt{5}\,R$	63.43^{o}
B	$\sqrt{5}\,X_c$	63.43^{o}
C	$\frac{\sqrt{5}\,R}{2}$	26.56^{o}
D	$\frac{\sqrt{5}\,X_c}{2}$	26.56^{o}

41 Two photons X and Y, if the wavelength of photon X is λ, while the wavelength of photon Y is 1.5λ, then the momentum of photon Y is.....

A	equal to $\frac{2}{3}$ of the momentum of photon X
B	equal to $\frac{3}{2}$ of the momentum of photon X
C	greater than the momentum of photon X by half
D	smaller than momentum of photon X by half

42 In cathode ray tube, when the filament becomes hotter, then the brightness of the fluorescent screen will.....

A	increase, due to increase the number of emitted electrons
B	decrease, due to increase the number of emitted electrons
C	unchanged, due to constancy the number of emitted electrons
D	vanish, due to the vanishing number of emitted electrons

43 **In a Coolidge tube, when the filament current is increased and the target is replaced by another one of a lower atomic number, then.....**

	intensity of X-rays	longest wavelength of the characteristic spectrum
A	increases	increases
B	increases	decreases
C	decreases	increases
D	decreases	decreases

44 **In a pure semiconductor crystal, if the concentration of free electrons or holes is 1.5×10^{12} cm^{-3}, and impurity atoms of pentavalent are added at a concentration of 2×10^{13} cm^{-3} and impurity atoms of trivalent are added at a concentration of 1×10^{13} cm^{-3}, then.....**

	Type of the doped crystal	Concentration of holes after completion of the doping process
A	P- type	1×10^{13} cm^{-3}
B	P- type	2.25×10^{11} cm^{-3}
C	N- type	1×10^{13} cm^{-3}
D	N- type	2.25×10^{11} cm^{-3}

Third, essay questions: each question two marks

45	A solenoid of number of turns N is connected to a battery of electromotive force V_B, of negligible internal resistance. A direct electric current (DC) of intensity **I** passes through it producing a magnetic field at a point inside it on its axis equal to B. On adding one third of the number of turns of the coil, and connecting the coil after modification to the same battery, Calculate the magnetic flux density in terms of B.
46	In an experiment to carry out a simple electric generator consisting of a one turn rotating at an angular velocity (ω) between the poles of a U-shaped magnet of magnetic flux density (B) by using a metal wire. A wire of length L was wound into a square coil, and the maximum induced electromotive force generated was equal to V. So, when a wire of length 2L was wound into a square coil rotating at the same angular velocity between the poles of the same magnet. Calculate the maximum induced electromotive force in terms of V.