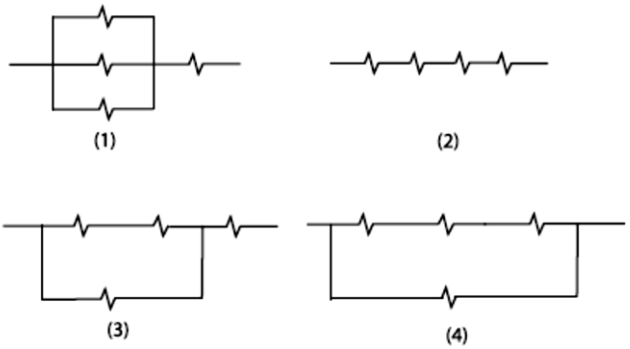
EXAM (1)

1. Four equal resistors are connected together as in figures, so, the correct arrangement for the figures from the highest equivalent resistance to the least one is



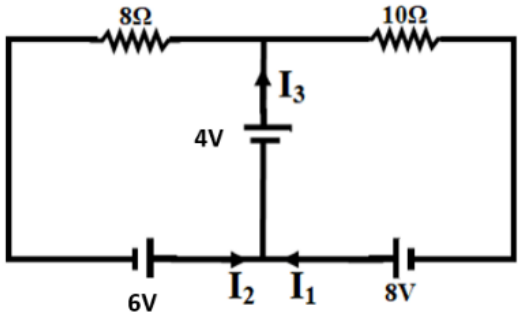
A) 4<1<3<2

B)1<2<3<4

c) 4<3<2<1

D) 1<4<2<3

2. In the circuit shown, the value of electric current (I_3) is .....



A) 2.45A

B) 1.25 A

C) 12 A

D) 2 A

3. A current of (I) intensity passes in a conductor of (L) length and its cross-sectional area (3A), when the same battery is used with a different conductor of the same material as the first one, it was found that a current of (3I) passes in it, this is due to .....

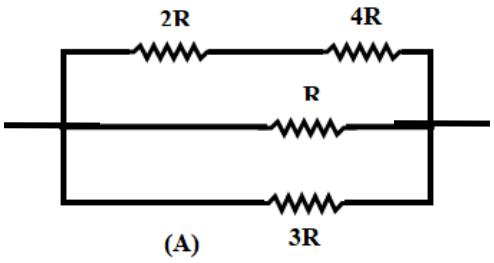
A) The second conductor is of length (2L) and its cross-section area = (18 A)

B) The second conductor is of length (3L) and its cross-section area = (3 A)

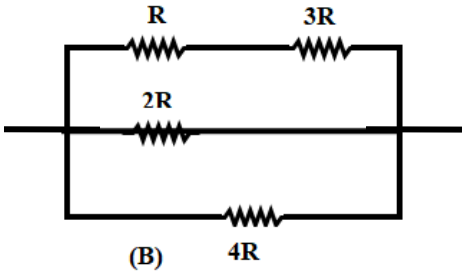
C) The second conductor is of length (18L) and its cross-section area = (2 A)

D) The second conductor is of length ($\frac{1}{3}$L) and its cross-section area = (A)

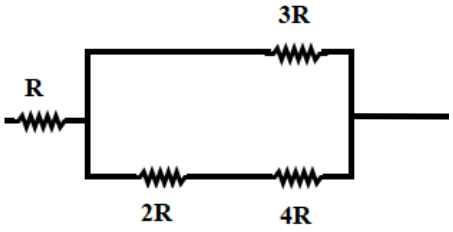
4. **Which combination of the resistors shown in the figure gives an equivalent =R?**



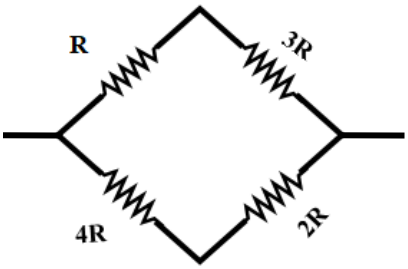
(A)



(B)

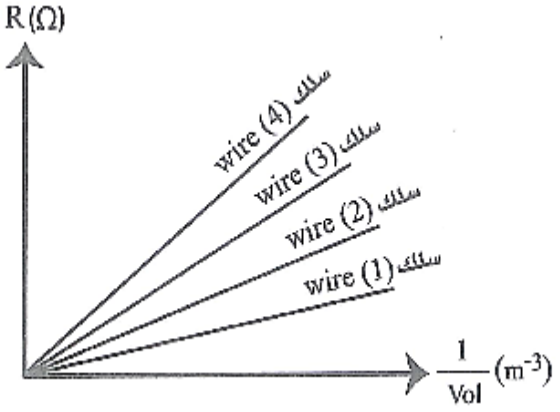


(C)



(D)

5. **The graph shows the relation between the electric resistance (R) and the reciprocal of the volume ($\frac{1}{Vol}$) for many wires of same length but of different materials. The correct arrangement of these wires concerning the conductivity of their materials is …….**



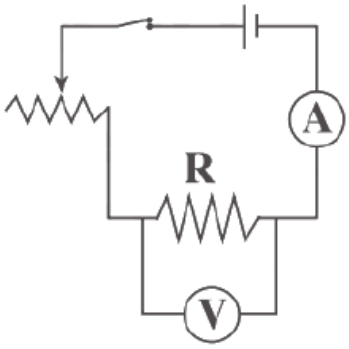
a) $\sigma_4 > \sigma_1 > \sigma_3 > \sigma_2$

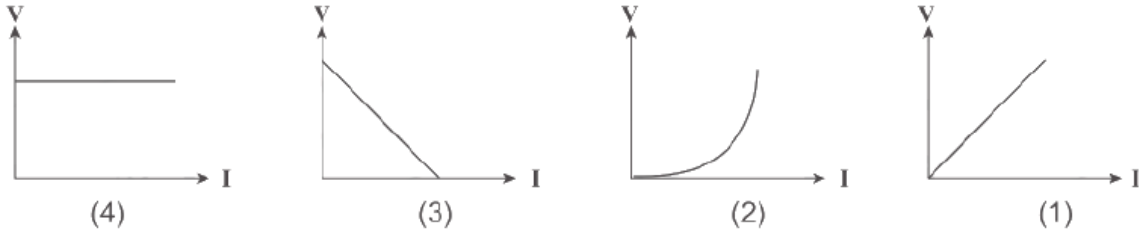
b) $\sigma_1 > \sigma_3 > \sigma_2 > \sigma_4$

c) $\sigma_1 > \sigma_2 > \sigma_3 > \sigma_4$

d) $\sigma_4 > \sigma_3 > \sigma_2 > \sigma_1$

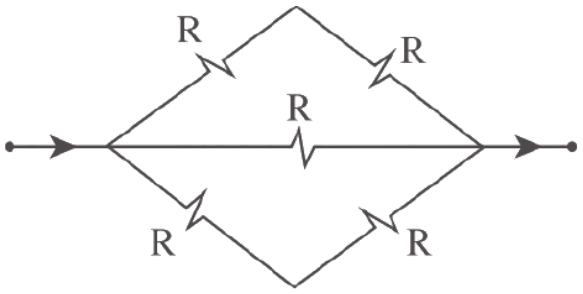
6. (Egypt 2023) Which graph represnts the correct relation between the electric potential difference between the two terminals of fiXed resistance and the ammeter reading at the same temperature ?





ⓐ 2 ⓑ 4 ⓒ 3 ⓓ 1

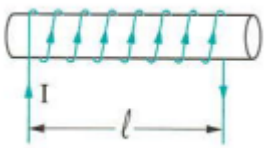
7. (Egypt 2023) The figure represents part of circuit. The equivalent resistance of the combination is…….



a) R b) 2R

c) $\frac{R}{2}$ d) $\frac{5R}{3}$

8. The figure illustrates a solenoid of length L, cross-sectional area A and number of tums N through which a current I passes , if its tums are displaced apart so that its length gets increased to 3L, The magnetic flux density along its axis



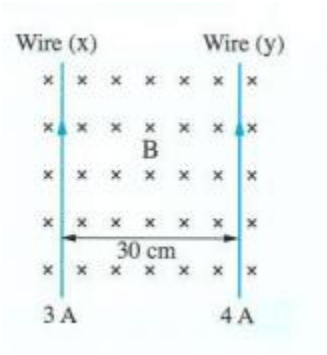
a) Decreases to $\frac{1}{3}$ of its initial value

b) Decreases to $\frac{1}{6}$ of its initial value

c) Decreases to $\frac{1}{9}$ of its initial value

d) Decreases to $\frac{1}{12}$ of its initial value

9. The figure shows two parallel wires (X) and (Y) , the normal distance between them is 30 cm, carrying electric currents of intensities (3A) and (4A) respectively and are affected by external magnetic field of flux density (B) as shown in the figure. If the resultant magnetic force per unit length of the wire (X) is 2×10^{-5} N/m. Then, the value of (B) equals .....

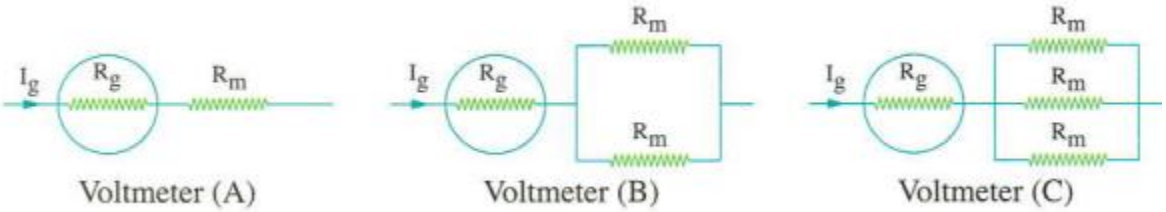


a) $9.33\times 10^{-6}T$
b) $4 \times 10^{-6}T$
c) $2,67 \times 10^{-6}T$
d) $6.67 \times 10^{-6}T$

10. An electric current passes though a rectangular coil whose plane is parallel to the direction of a magnetic field of flux density 2 T, if the magnetic dipole moment of coil is 0-3 A.m2, the torque acting on the coil equals.....

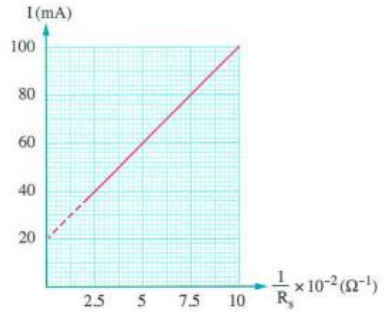
a) 0.6N.m
b) 0.15N.m
c) 0.06N.m
d) 0.015N.m

11. Three galvanometers of equal coil resistances R_g was connected to three multipliers to convert them into three voltmeters (A, B and C) as shown in the following figurcs, so the correct arrangement for the maximum readings of them (VA, VB and VC) will be ....



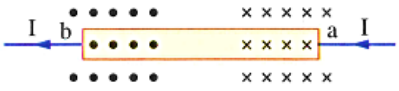
a) $V_B > V_A > V_C$
b) $V_A < V_C < V_B$
c) $V_c > V_B > V_A$
d) $V_c < V_B < V_A$

12. The graph represents the relation between the maximum current intensity measured by an ammeter and the reciprocal of its shunt resistor, so the maximum potential difference between the shunt terminals equals…….



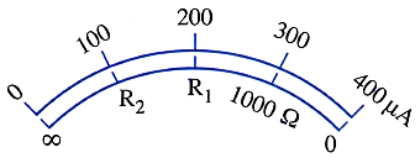
a) 0.1V
b) 0.8V
c) 1.2V
d) 1V

13. In the opposite figure a free to move light rod (ab) is placed in the plane of the page. If the rod carries an electric current while being affected at its terminals by two magnetic fields of opposite directions, which of the following choices shows the directions of the forces that act on the rod terminals?.....



a) a is upwards and b is downwards
b) a is downwards and b is upwards
c) a and b are upwards together
d) a and b are downwards together

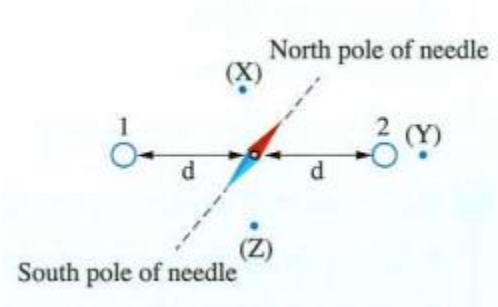
14. The opposite figure represents equal divisions of the ohmmeter scale, so the values of R_1 and R_2 are……respectively.



a) 3000 Ω, 6000 Ω b) 2000 Ω, 3000 Ω

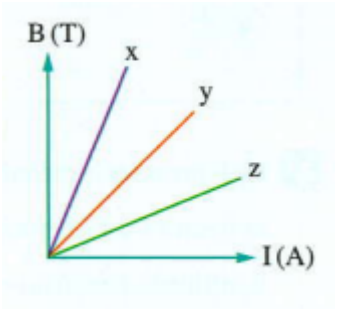
c) 3000 Ω, 9000 Ω d) 2000 Ω, 6000 Ω

15. Two straight wires 1, 2 are in the same plane perpendicular to the plane of the page, a current of I intensity passes through each of them in the same direction, so if a magnetic needle is placed at the mid-point between them as in the figure, the north pole of the needle is expected to ....



a) deflect till point x
b) deflect till point Y
c) deflect till point Y
d) keep its orientation without deflection

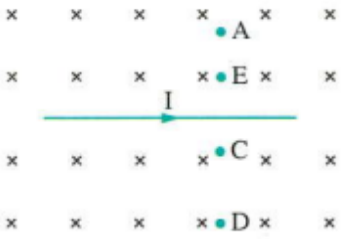
16. The graph represents the relation between the magnetic flux density (B) at a point due to passing a current in the straight wire and the current intensity (I) for three straight wires (x, y and z), so this point is .. .



a) nearer to wire (z) than wire (y)
b) at equal distances from the wires (x. y, z)
c) nearer to wire (x) than wire (y)
d) nearer to wire (y) than wire (x)

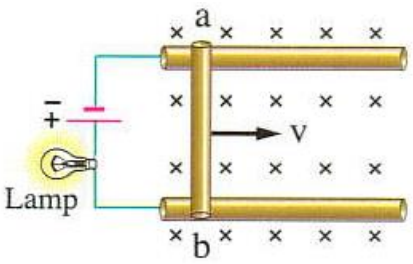
17. The figure represents a straight wire carrying current (I) placed in a uniform magnetic field. So, the arrangement of the resultant magnetic flux density (B) at points (A, E, C, D) will be ....

a) $B_C > B_D > B_A > B_E$
b) $B_D > B_C > B_E > B_A$
c) $B_A > B_C > B_D > B_E$
d) $B_E > B_C > B_D > B_A$



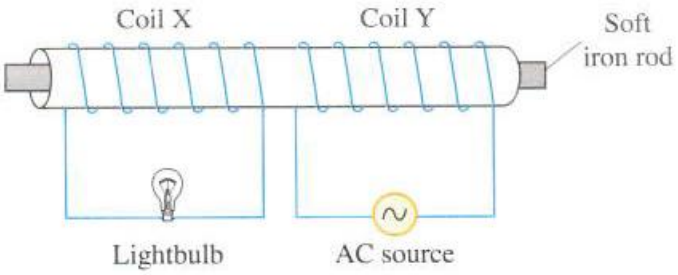
18. In the opposite figure, during the motion of the rod (ab) to the right as shown, the brightness of the lamp.....

a) Increases
b) Decrease
c) Remains the same
d) Vanishes

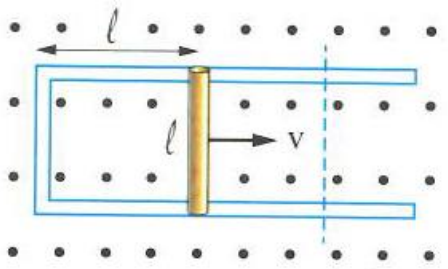


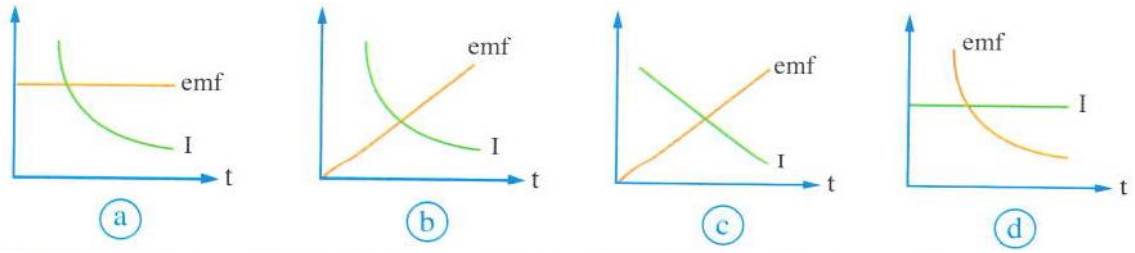
19. In the opposite figure, after removing the soft iron rod from the inside of the two coils X, Y, the brightness of the lightbulb.....

a) increases
b) decreases
c) remains constant
d) vanishes



20. The opposite figure represents a metal rod of length and resistance R. It moves with a uniform velocity v while its ends are touching a metal frame of the same material of the rod and having the same cross-sectional area. The group is placed in a uniform magnetic field of flux density B that is perpendicular to the direction of motion of the rod. Which of the following graphs represents the relation between both of the induced electromotive force (emf) in the rod and the passing induced current intensity (I) through them versus time (t)?

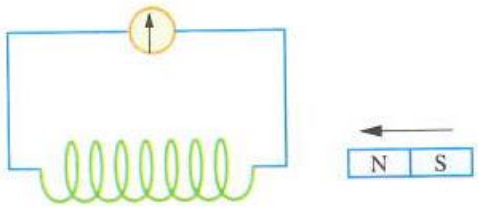


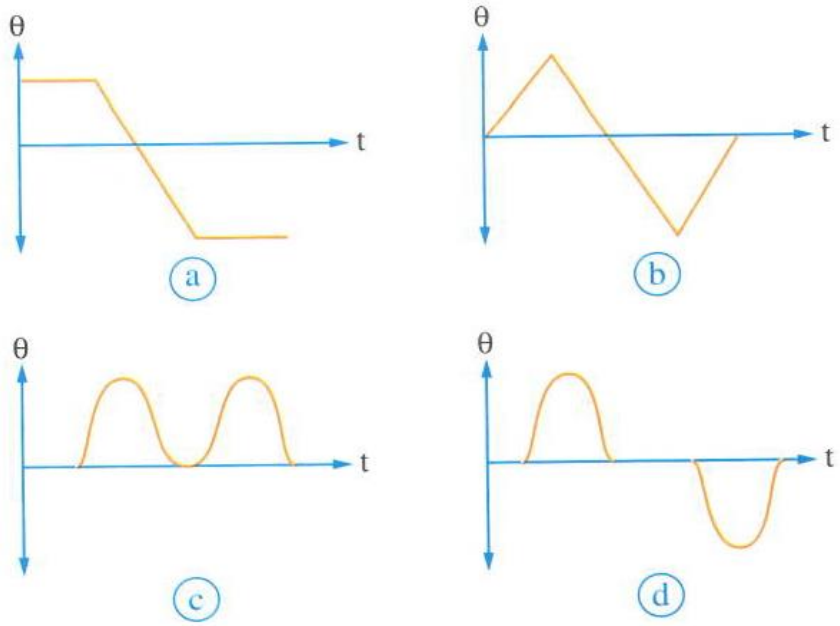


21. Two coils (X) and (Y), the area of coil (X) is double of that of coil (Y) while the number of tums of (X) is 1/3 of that of coil Y. When the two coils are placed inside a magnetic field (its flux density (B) can be changed) where the coils' planes are perpendicular to the flux lines direction and the flux density that affects the two coils changes by the same rate, then the ratio of the average induced emf in coil (X) to the average induced emf in the coil (Y)

a) 1/6
b) 3/4
c) 2/3
d) 2/5

22. In the opposite figure a small magnet is moving with a uniform velocity towards a solenoid connected to a galvanometer till it passes through the coil and gets out from its other side, then which of the following graphs represents the relation between the deviation angle of the galvanometer pointer (0) and time (t)?

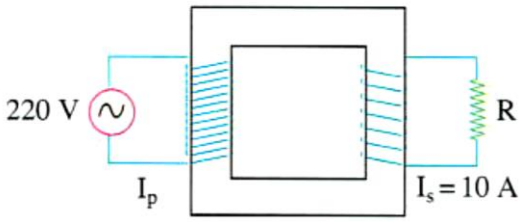




23. AC dynamo whose coil consists of 200 tums and has area of 0.01 m2 rotates inside a magnetic field of flux density 0.3 T. If the maximum value of the produced e.m.f is 376.99 V the angular velocity of the coil equals …….. rad/s

a) 100π
b) 50π
c) 150π
d) 200π

24. The figure shows a step-down electric transformer with efficiency of 80% and the ratio between the number of tums of its two coils is 3/5. then the value of the produced voltage at the secondary coil equals to……..while the current intensity through the primary toil equals to…



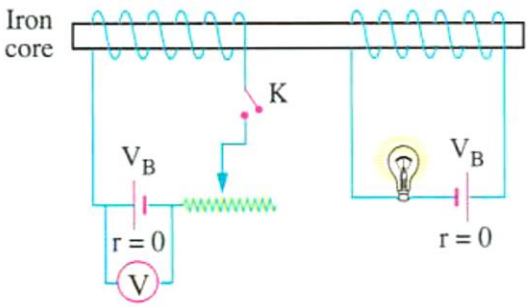
a) 108.3V, 6A
b) 105.6V, 8A
c) 108.3V, 8A
d) 105.6V, 6A

25. A coil is placed inside a uniform magnetic field where its plane is perpendicular to the flux lines direction then. the ratio between:

$$\frac{\textit{the average induced emf in a coil when it is routated } 0.25 \textit{ cycle during time } t}{\textit{the average induced emf in a coil when it is routated } 0.5 \textit{ cycle during the same time } t}$$

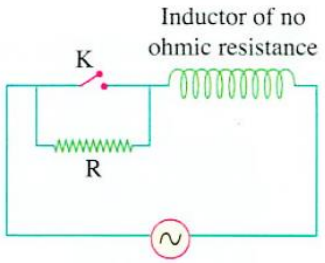
a) 0.5
b) 1
c) 0.25
d) 0.75

26. Two adjacent coils with the same iron core as in figure. At the instant of switching on the key (K) ……..



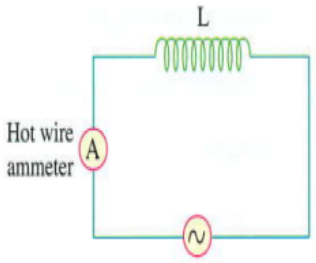
a) the illumination of the bulb increases, and the voltmeter reading remains constant.
b) the illumination of the bulb decreases and the voltmeter reading increases.
c) the illumination of the bulb decreases and the voltmeter reading decreases.
d) the illumination of the bulb decreases, and the voltmeter reading remains constant.

27. In the opposite AC circuit, as the switch (K) is closed the phase angle between VT and I will ……..



a) not change
b) increase
c) decrease
d) vanish

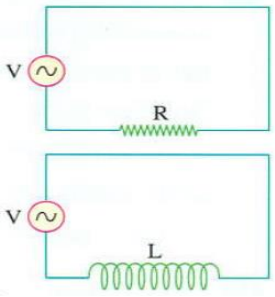
28. The opposite figure shows a series AC circuit containing an AC source of maximum voltage 250 V, an inductor of negligible ohmic resistance and a hot wire ammeter of resistance 12Ω. If the reading of the ammeter =10A. the inductive reactance of the coil=…..

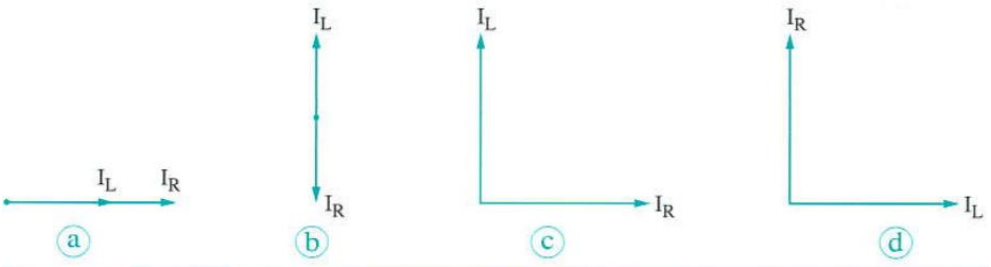


a) 17.67 Ω b) 12.98 Ω

c) 21.93 Ω d) 5.68Ω

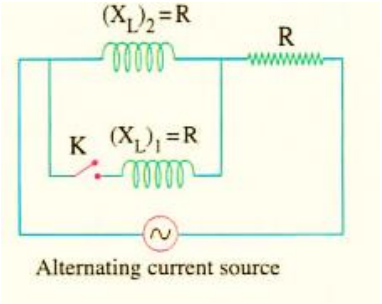
29. The figure illustrates two AC circuits, one contains an ohmic resistance (R) while the other contains an inductive coil (L) of negligible ohmic resistance. Assuming that the voltages of the two sources are in the same phase, so the diagram below that represents the phase difference between the currents I_R and I_L is ……





30. A tuning circuit (X) consists of an inductor with inductance 0.2 H and a capacitor of capacitance 0.2 pF Another tuning circuit (Y) consists of an inductor of inductance 0.4 H and a capacitor of capacitance 0.1 pF, then the ratio of : $\frac{\text{the resonance frequency of circuit (X)}}{\text{the resonance frequency of circuit (Y)}}$ =

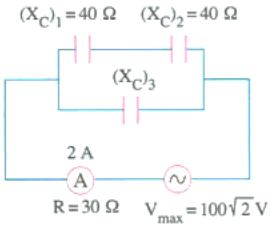
a) $\frac{2}{1}$ b) $\frac{1}{4}$ c) $\frac{1}{1}$ d) $\frac{4}{1}$



31. An AC circuit contains an ohmic resistance and two inductors of negligible ohmic resistance, such that when the key (K) is open, the phase angle between the total voltage and the current is (0), so when the key (K) is closed, the phase angle between the total voltage and current……

a) Increases b) decreases but doesn't reach zero

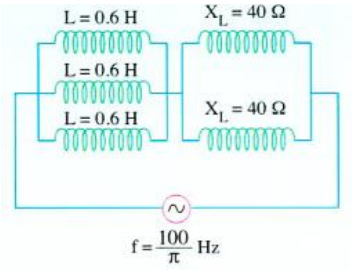
c) becomes zero d) doesn't change



32. .An AC source produces maximum electromotive force of $100\sqrt{2}$ V and it is connected with three capacitors and a hot wire ammeter as shown in the figure. Using the shown data in the figure, the value of the capacitive reactance $(X_C)_3$, equals…..

a) 80Ω b) 20Ω c) 40Ω d) 50Ω

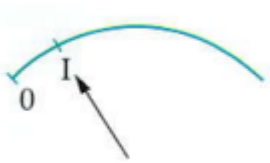
→ questions from 33:46 (2 marks):

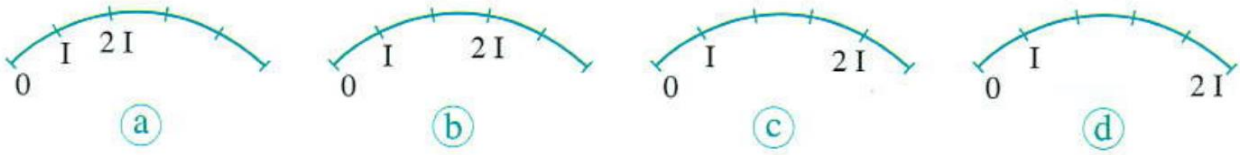


33. In the shown electric circuit, the equivalent inductive reactance equals to ……. .

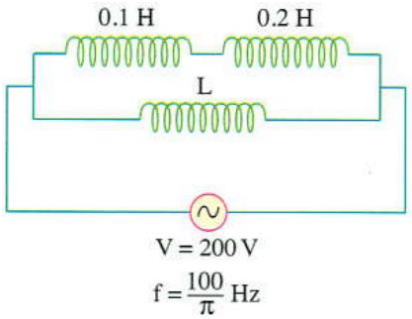
a) 40Ω b) 60Ω c) 20Ω d) 80Ω

34. During the calibration of a hot wire ammeter scale, when an AC current of effective value I passes through the device, its pointer gets deflected to the position shown in the opposite figure, so which one of the following figures represents the correct position of the pointer of the hot wire ammeter when the effective value of the passing current becomes 2I?





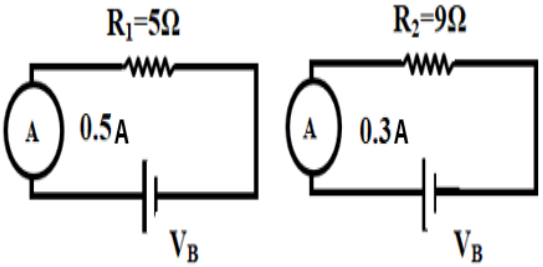
35. Three inductors of negligible ohmic resistances are connected together as in the figure, given that the effective value of the passing current in the circuit is 5 A and with neglecting the mutual induction between the coils, then the value of inductance L equals .....



a) 0.6 H b) 0.4 H

c) 0.3 H d) 1 H

36. A cell of unknown emf is connected to a resistance (R_1) and a current of 0.5 passes in the cell. When (R_1) is replaced by another (R_2), a current of 0.3 A passes in the cell. So, the emf of the cell .....=

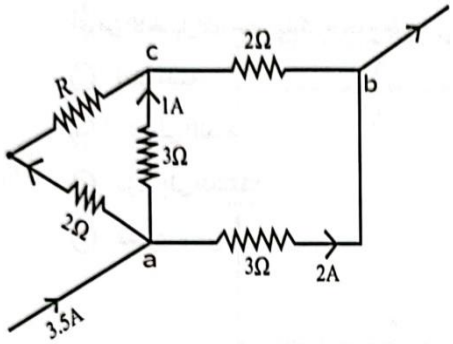


A) 3 V B) 1.5 V

C) 1.2 V D) 2 V

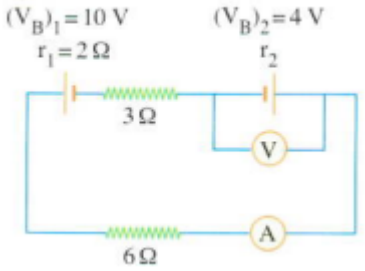
37. From the opposite figure, find the value of R

A. 2Ω
B. 3Ω
C. 4Ω
D. 6Ω

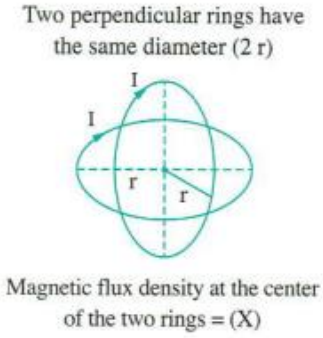


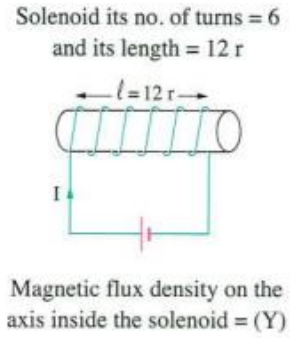
38. In the opposite electric circuit , if the reading of the voltmeter is 4.5V , then the value of the internal resistance (r_2) equals .....

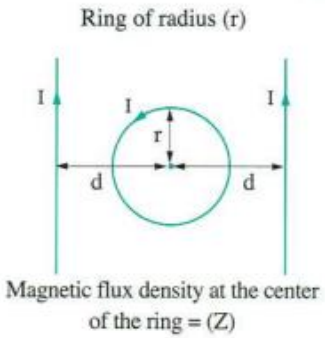
a)$0.5\ \Omega$ b)1Ω
c)1.2Ω d)1.8Ω



39. In the figure a group of electric conductors, each is carrying electric current (I).
Which of the following mathematical



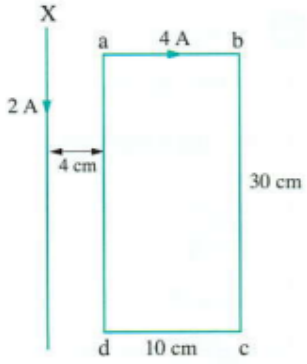




a) Z>Y b)X=Z c)X<Y d) X=Y

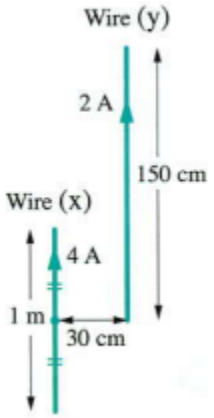
40. The figure shows a conducting rectangle (abcd) that carries 4 A electric current, another wire (X) which carries 2 A electric current is placed at 4 cm away from it, so the magnitude and direction of the magnetic force affecting wire X are .....

a) $1.54 \times 10^{-5} N\ to\ left$
b) $1.54 \times 10^{-5} N\ to\ right$
c) $8.57 \times 10^{-6} N\ to\ right$
d) $8.57 \times 10^{-6} N\ to\ left$



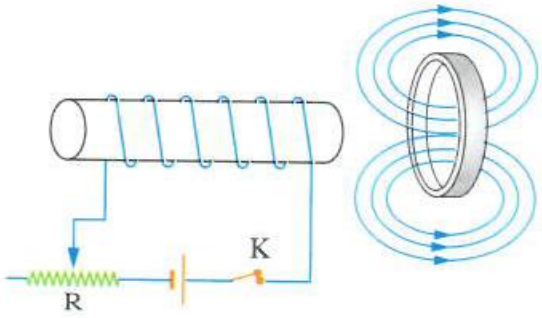
41. Two current carrying straight wires x, y are parallel as shown in the figure, the mutual magnetic force between the two wires equals .....

a) $2.67 \times 10^{-6} N$
b) $8 \times 10^{-6} N$
c) $5 \times 10^{-6} N$
d) $5.33 \times 10^{-6} N$



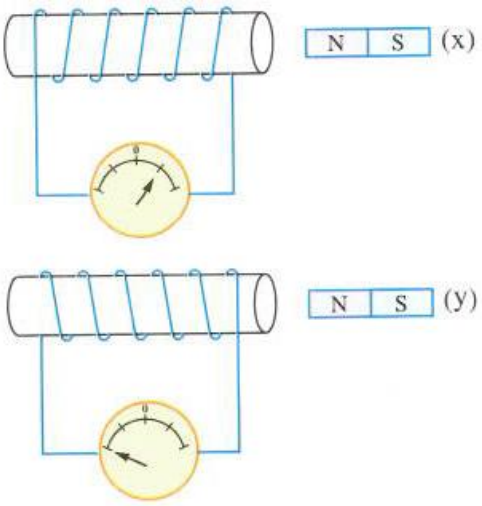
42. An induced magnetic field is initiated due to the flow of an induced current in the ring as in the opposite figure, when.....

a) opening switch K
b) inserting an iron rod in the coil
c) decreasing the resistance of R
d) moving the ring towards the coil



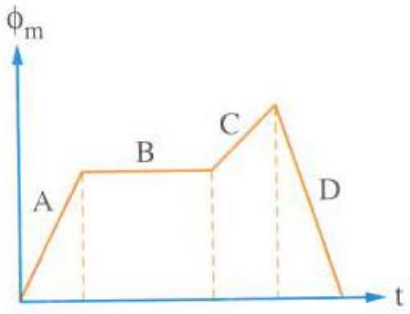
43. A student used two similar magnets (x), (y) to carry out Faraday's experiment twice, once by moving the magnet (x) with a uniform velocity (v) and another time by moving the magnet (y) with a uniform velocity (v) along the axis of a solenoid whose terminals are connected to a galvanometer having its zero at the middle of its scale. He noticed that the galvanometer pointer in each time was as in the opposite figure. According to this observation, it's clear that the speed of magnet (x) is....

a) greater than the speed of magnet (y) and in its direction
b) greater than the speed of magnet (y) and opposite to its direction
c) smaller than the speed of magnet (y) and in its direction
d) smaller than the speed of magnet (y) and opposite to its direction



44. the opposite graph represents the relation between the magnetic flux which passes through a coil and the time, then the stage in which the induced electromotive force in the coil vanishes is .....

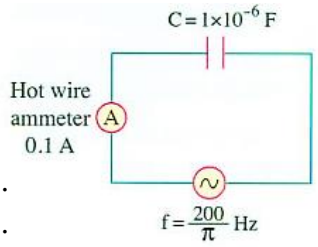
a) A
b) B
c) C
d) D



45. The efficiency of an electric transformer is 95% and it works on potential difference of effective value 200 V, if the number of turns of its coils are 75, 50 turns, then the maximum effective voltage can be obtained from the transformer equal.....

.....
.....
.....
.....
.....

46. The opposite figure represents an electric circuit that contains a hot wire ammeter of negligible ohmic resistance, a capacitor and an AC source, so effective value of the emf of the source equals .... .



.....
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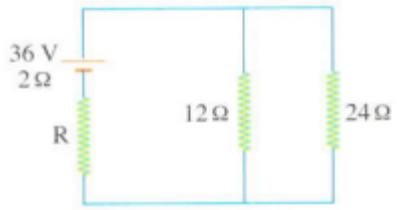
EXAM(2)

1. In the electric circuit which is shown in the opposite diagram , if the consumed power in the 12 ohm resistor equals 48 w , then the resistor R equals .....

a)1 ohm
b)1.5 ohm
c)2 ohm
d)2.5 ohm



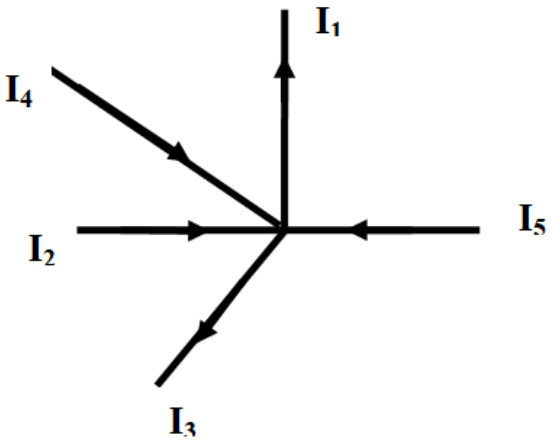
2. In the opposite figure .If the shown directions Represent the motion of the electrons ,so We can apply Kirchhoff's 1st law at the point (X) as follow .....

A) $-I_1 - I_3 + I_4 + I_2 + I_5 = 0$

B) $I_1 + I_3 + I_4 + I_2 + I_5 = 0$

C) $-I_1 + I_3 + I_4 + I_2 + I_5 = 0$

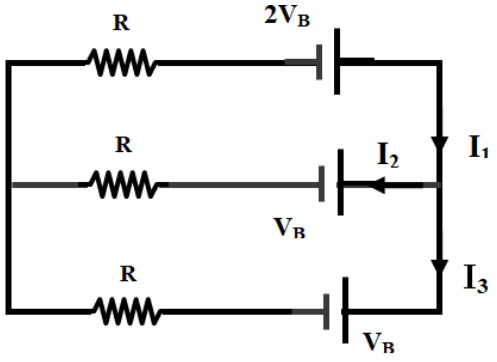
D) $I_1 + I_3 + I_4 - I_2 + I_5 = 0$



3. Using the data in figure the ratio between (I_2/I_1) = ...

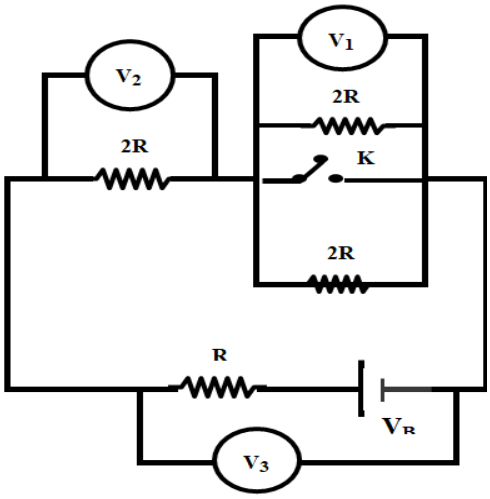
A) 2/1 B) 3/1

C) 1/3 D) ½

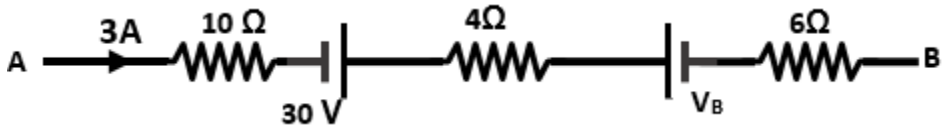


4. When the switch K is closed, which row shows the correct readings of the meters V_1, V_2, V_3 ?

	V_1	V_2	V_3
(a)	Becomes zero	Increases	Decreases
(b)	Increases	Increases	Decreases
(c)	Becomes zero	Decreases	Increases
(d)	Increases	Increases	Increases



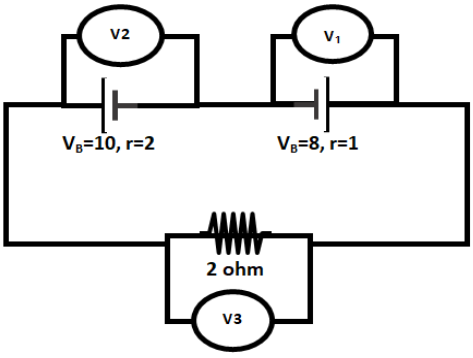
5. The following figure shows a part of an electric circuit, if the consumed power through the part between the two points a and b equals 210 W and the internal resistance of the electric cells are negligible, so:



The unknown electromotive force (V_B) equals…….

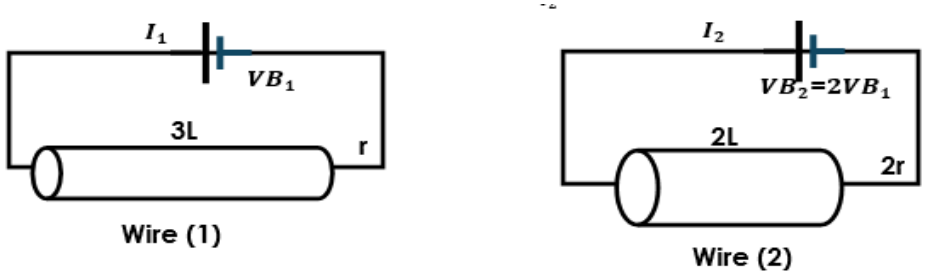
a) 30 V **b) 20 V** **c) 10 V** **d) 5 V**

6. In the opposite figure if the reading of v_3 is 0.8V ,which of the following express on reading of V_1,V_2



	V_1	V_2
A	10 V	6v
B	8.4 V	9. 2v
C	7. 6 V	9.2v
d	4 V	8v

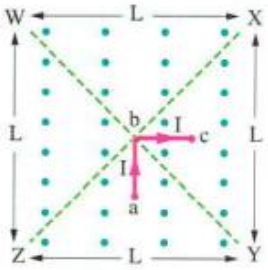
7. Two wires (1) and (2) are made of same material, wire (1) has length (3L) and radius (r) while wire (2) has length (2L) and radius (2r) as shown in the figure :



So, the ratio $\left(\frac{I_1}{I_2}\right)$= .....

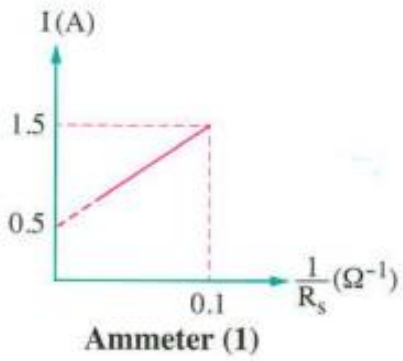
a) $\frac{12}{1}$ b) $\frac{1}{12}$ c) $\frac{3}{2}$ d) $\frac{1}{6}$

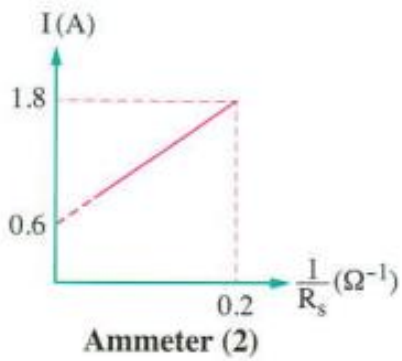
8. A straight metal wire that carries an electric current of (I) intensity, is bent into two equal and perpendicular parts {ab, bc }, then placed parallel to the page inside a uniform magnetic field which is perpendicular out of the page as in the figure, toward which point (Z, Y, X, W) the point b of the wire will move?



a) Point Y
b) Point X
c) Point W
d) Point Z

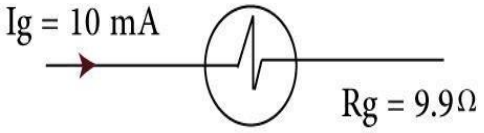
9. The graphs illustrate the relation between maximum current intensities that can be measured by two ammeters and the reciprocal of shunt resistance $\frac{1}{R_s}$ in each of them, so , the ratio between $\frac{R_{g1}}{R_{g_2}}$ =.....



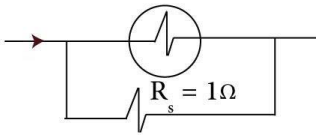


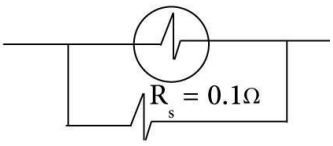
a) $\frac{1}{3}$ b) $\frac{2}{1}$ c) $\frac{3}{1}$ d) $\frac{1}{2}$

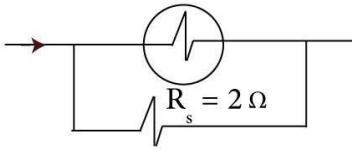
10. The figure represents a sensitive galvanometer.

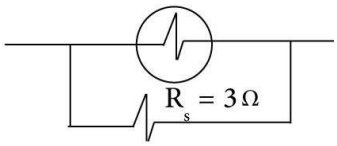


Which of the following figures correctly represent the modification to the galvanometer to become capable of measuring a maximum current of 1A?





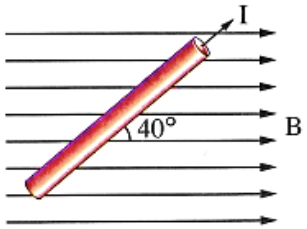




11. Ohmmeter of internal resistance 3000 Ω its pointer deflects by an angle (θ) when its terminals are connected together and when it is connected with resistance R1 the pointer deflects by an angle ($\frac{\theta}{3}$) and by replacing R1 by another resistance R2 the pointer deflects by an angle ($\frac{\theta}{4}$) so the value of R1 and R2 equal…….

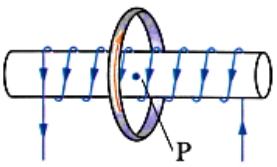
The choice	R_1	R_2
a	9000 Ω	3000 Ω
b	6000Ω	12000 Ω
c	3000 Ω	12000 Ω
d	6000 Ω	9000 Ω

12. The opposite figure shows a straight wire of length 50 cm that carries an electric current of intensity 2.5 A, if the wire is inclined on a uniform magnetic field of flux density 0.2 T, so every one meter of the wire is affected by a magnetic force of magnitude…….



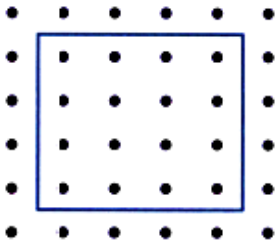
a) 0.16 N b) 0.32 N c) 0.28 N d) 0.56N

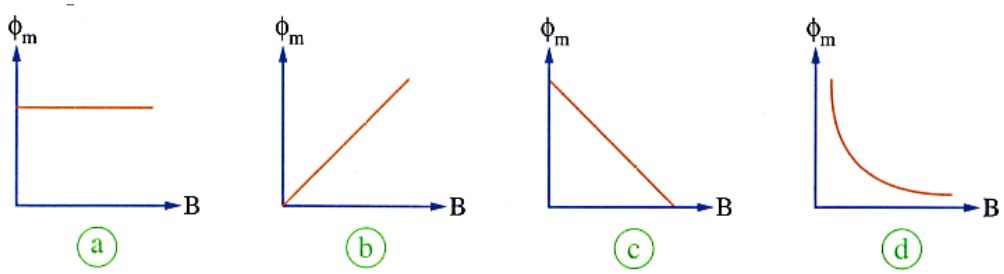
13. In the opposite figure, a solenoid has been coiled to have one turn per each centimeter of its length and it carries a current of intensity 7 A, if this solenoid is wrapped by another circular coil of 40 turns that has a radius of 2 π cm and carries a current of 2.2 A such that its center P lies at the middle of the axis of the solenoid where the two axes of both coils coincide, so the resultant magnetic flux density at the point P equals…….



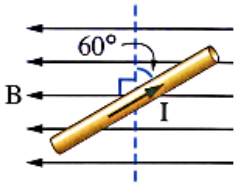
a) 0 b) 6.6×10^{-4}T c) 8.8×10^{-4}T d) 10.6×10^{-4}T

14. A rectangular coil is placed perpendicular to a magnetic field whose density is changing uniformly while its direction is constant and out of the page as shown in the figure. Which of the following graphs represents the relation between the total flux (ϕm) that passes through the coil and the value of the magnetic flux density (B) in which the coil is placed?.....



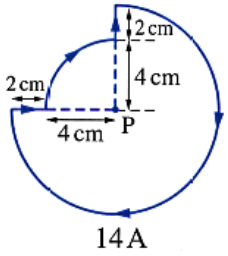


15. In the opposite figure, a straight wire of length 40 cm carries an electric current of intensity 5 A while being in a uniform external magnetic field of flux density 0.6 T, if the plane of the wire is parallel to the external field, so the magnitude and the direction of the magnetic force that affects the wire are.....



	The magnitude of force (F)	The direction of the magnetic force (F)
(a)	0.6 N	perpendicular out of the page
(b)	0.6 N	perpendicular into the page
(c)	1.2 N	in the plane of the page and to the right
(d)	1.2 N	in the plane of the page and to the left

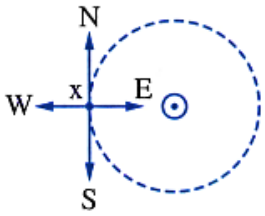
16. The opposite figure shows a wire that has been reshaped in the form of a ring, then an electric current is provided to pass through it, so the resultant of the magnetic flux density at the center P equals……



a) 5.72 × 10-5 T b) 7.52 × 10-5 T

c) $1.24 \times 10^{-4} T$ d) $1.65 \times 10^{-4} T$

17. The opposite figure shows a straight wire that is perpendicular to the plane of the page and carries an electric current that is directed out of the page, then the correct direction for the produced magnetic field from the wire at point x is

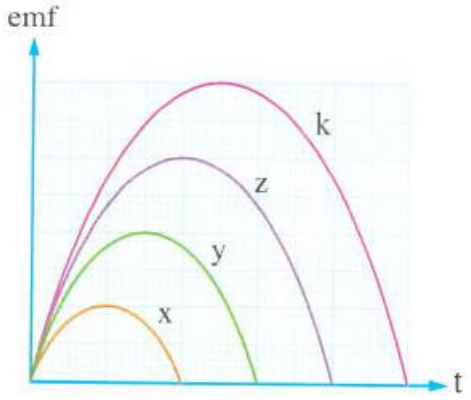


a) N b)S c)E d)W

18. An ideal electric transformer is used to light an electric bulb on which (120 V, 40 W) is written, so the bulb glows with its full power. If the potential difference between the terminals of the primary coil of the electric transformer is 180 V, then…….

	$\frac{I_p}{I_s}$	$\frac{N_p}{N_s}$
a	$\frac{2}{3}$	$\frac{3}{2}$
b	$\frac{3}{2}$	$\frac{2}{3}$
c	$\frac{2}{3}$	$\frac{2}{3}$
d	$\frac{3}{2}$	$\frac{3}{2}$

19. electric generators x, y, z, k have the same number of turns and are affected by similar magnetic fields. The opposite graph represents the relation between the induced (emf) in the coil of each of them through half cycle for each coil and the time (t), so the relation between the face areas of these coils is



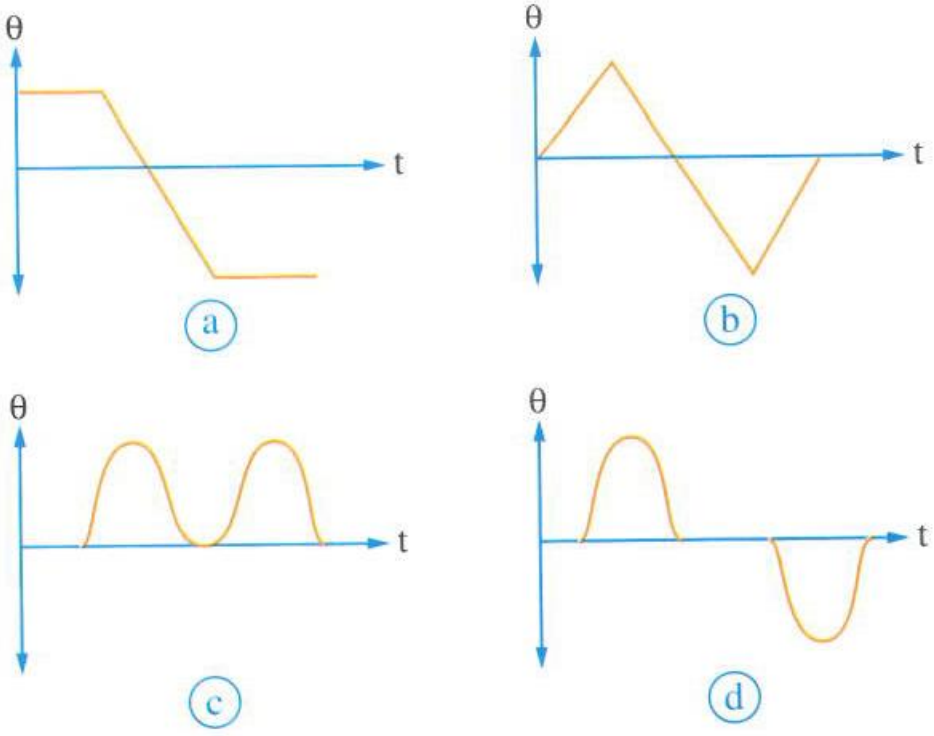
(a) $A_x > A_y > A_z > A_k$

(b) $A_x = A_y = A_z = A_k$

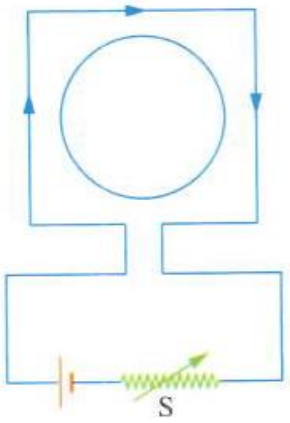
(c) $A_k > A_y > A_z > A_x$

(d) $A_k > A_z > A_y > A_x$

20.n the figure a small magnet is moving with a uniform velocity towards a solenoid connected to a galvanometer till it passes through the coil and gets out from its other side, then which of the following graphs represents the relation between the deviation angle of the galvanometer pointer (0) and time (t)?

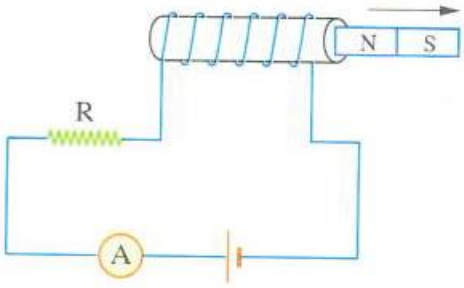


21. In the opposite figure, a square metal frame is connected to an electric cell and a variable resistor (S). A metal ring is placed inside the frame and in its plane, then during the increase of resistance S,



a) no electric current is produced in the ring.
b) an electric current is produced in the ring in clockwise direction.
c) an electric current is produced in the ring in counterclockwise direction.
d) an AC electric current is produced in the ring.

22. In the electric circuit shown in the opposite figure, if the reading of the ammeter was constant, then when the magnet is being pulled out from the coil, the ammeter reading will…….

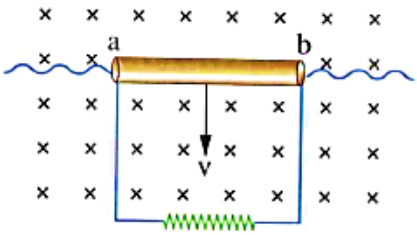


a) a remain unchanged
b) decrease
c) vanish
d) increase

23. a square coil consists of one turn where its side length is (L). it moves with uniform velocity from the shown position in the figure till it enters completely into a magnetic field (B) through 1s, so during this interval, the induced emf in the coil equals…….

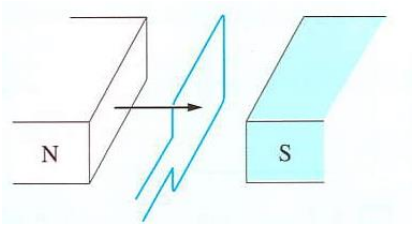
a) $2BL^2$
b) BL^2
c) $0.5BL^2$
d) 0.5Bl

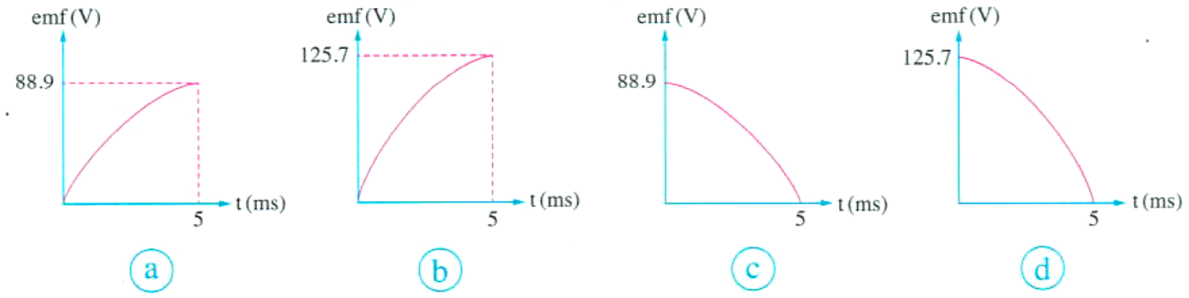
24. The opposite figure shows a wire ab that is connected to a closed electric circuit and moves with a uniform velocity (v) perpendicular to an external uniform magnetic field, so which of the following choices is correct?.....



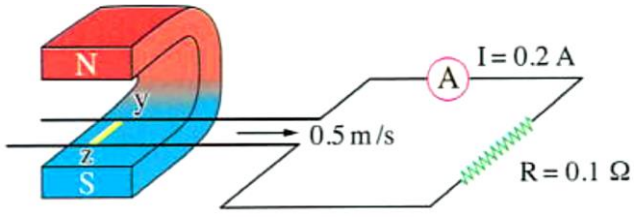
a) The wire works as a battery where terminal a is the positive pole and terminal b is the negative pole
b) The wire works as a battery where terminal a is the negative pole and terminal b is the positive pole
c) An induced electric current pass through the external circuit from terminal a to terminal b
d) No induced current is generated in the wire ab

25. The figure shows a dynamo coil of 200 turns and area $0.1m^2$ that rotates starting from the perpendicular position with frequency 50 Hz between two poles of magnet of flux density 20 mT. Which of the following graphs correctly represents the produced instantaneous emf in the dynamo coil from 0 ms to 5ms?





26. The figure shows a metallic wire (yz) sliding on two metallic bars with velocity 0.5 m/s perpendicular to the direction of a magnetic field of flux density 2 T. If the reading of the ammeter is 0.2 A. so the length of the moving wire zy in the magnetic field equals.....



a) 0.04m
b) 0.02m
c) 0.01m
d) 0.03m

27. In the hot wire ammeter, the wire is mounted on a metallic plate of the same expansion coefficient as the wire to……..

a) make the pointer return back quickly to zero position as current is turned off

b) decrease the efficiency of the device

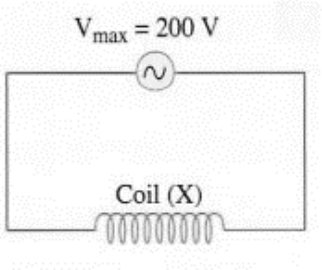
c) avoid the zero error

d) increase the thermal expansion of the wire

28. A 10 µF capacitor is connected to a 1000 Hz oscillator of maximum emf 5 V, hence the maximum intensity of the current that passes in the capacitor circuit is approximately equal to…….

a) 0.6 A b) 1.2 A c) 0.8 A d) 0.3 A

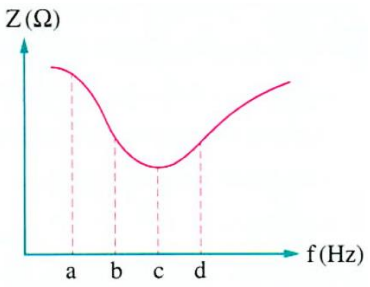
29. The opposite figure shows an AC source, whose maximum voltage is 200 V and its frequency is 50 Hz, connected to an inductive coil (X) of self-inductance (L) and negligible ohmic resistance. Given that the effective value of current passing in the circuit is 2 A, what are the value of self-inductance and the method of connecting another coil with coil (x) to double the effective value of the current in the circuit?



a) 0.22 H, in series. b) 0.22 H, in parallel.

c) 0.32 H, in series. D) 0.32 H, in parallel.

30. An alternating current circuit contains an inductive coil of negligible ohmic resistance, a capacitor of variable capacitance and an ohmic resistance in series. From the figure, the source voltage becomes equal to the potential difference across the ohmic resistance at frequency.....



a) c only b) b and d

c) a only d) a and c

31. The following four figures illustrate four similar capacitors, each of capacitance C.

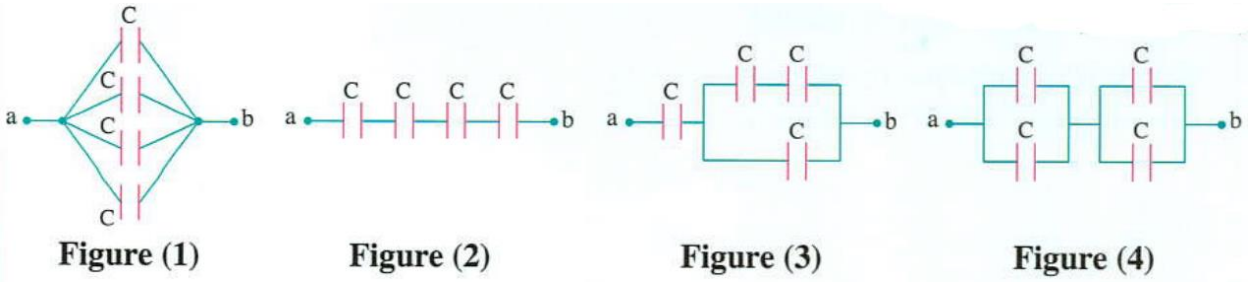
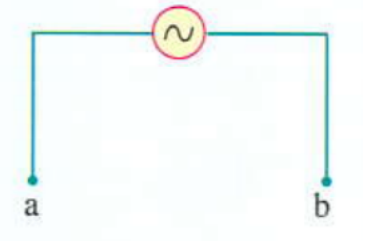


Figure (1) Figure (2) Figure (3) Figure (4)

So, which figure should be connected between the points (a, b) to close the opposite electric circuit so that the electric current that passes through the circuit has the maximum value?



a) Figure (1) b) Figure (2)

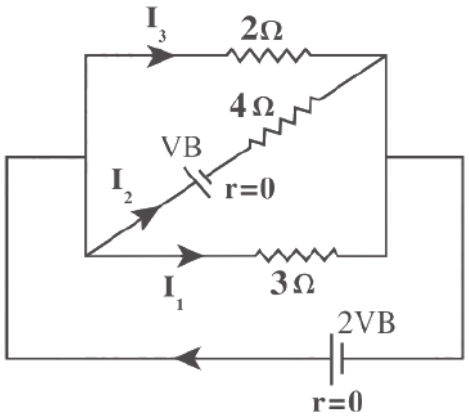
c) Figure (3) d) Figure (3)

32. In a hot wire ammeter, the heat energy generated in the platinum - iridium wire as the alternating electric current flows is directly proportional to the .....

a) $\frac{1}{v_{eff}^2}$ b) I_{eff} c) I_{max} d) v_{eff}^2

→ questions from 33:46 (2 marks):

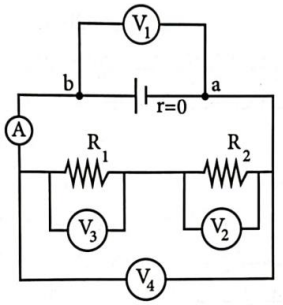
33. In the shown electric circuit, the Ratio between $\frac{I_3}{I_2}$ is .....



a) $\frac{2}{1}$ b) $\frac{1}{2}$

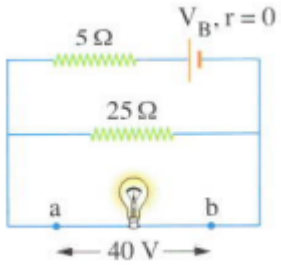
c) $\frac{1}{4}$ d) $\frac{4}{1}$

34. In the opposite figure, any of these voltmeters are equals



A. V_2, V_4
B. V_2, V_3
C. V_2, V_1
D. V_4, V_1

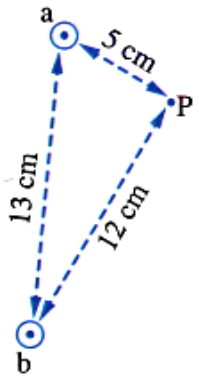
35. In the opposite electric circuit , if the consumed power through the bulb is 16 W and the potential difference between it's terminals is 40 V , so the emf of the battery (V_B)equals .....



a)40V b)50V

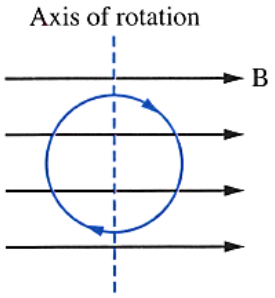
c)60V d)100V

36. In the opposite figure, two long parallel wires a and b are perpendicular to the plane of the page while through each of them an electric current of intensity 25 A is passing in a direction as shown in the figure, so the magnetic flux density at point P approximately equals…….



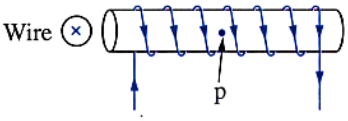
a) 1.1 × 10-5T b)1.2 × 10-5 T c) 1.1 x 10-4T d) 1.2 x 10-4T

37. In the opposite figure, when a current carrying circular coil was placed parallel to a uniform magnetic field of flux density B, the resultant magnetic flux density at the center of the coil was $\sqrt{5}$ B and when the coil rotates 90°, the resultant magnetic flux density at the center of the coil could be……



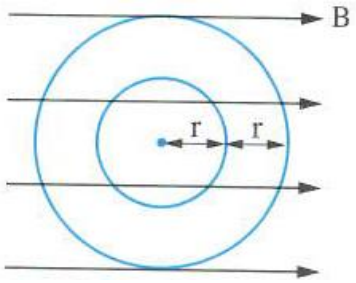
a) B or2B b) B or 5 B
c) B or 3 B d) zero or B

38. In the opposite figure, a solenoid carries an electric current that generates a magnetic flux density B at the center of its axis (point p) and beside the solenoid there is a straight wire that is perpendicular to the plane of the page where it carries a current that generates a magnetic flux density B at point p. So, the total magnetic flux density at point p is……



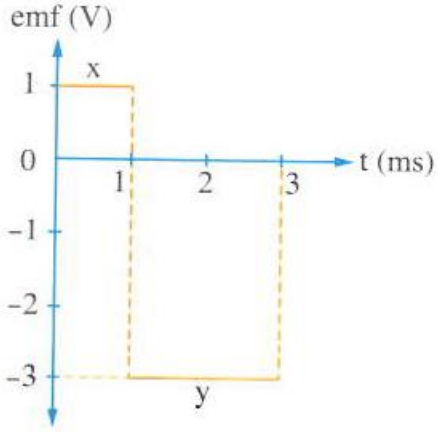
a) zero b)B c)$\sqrt{2}$ B d)n 2B

39. Two concentric metal rings of the same material are placed in One plane affected by a uniform magnetic field B whose direction is parallel to the plane of the two rings as in the opposite figure. f the magnetic flux has vanished through a time (t), then which statement of the following is correct?



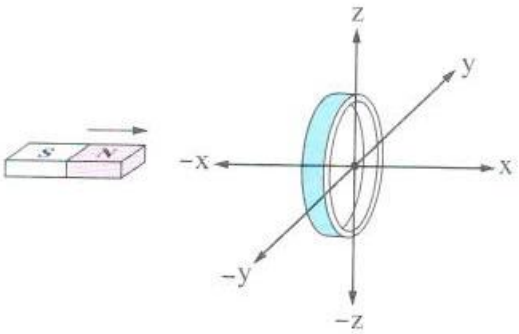
a) The induced current in the external ring is double that in the internal ring.
b) The induced current in the internal ring is double that in the external ring.
c) The induced current is the same in both rings.
d) No induced current is generated in the two rings.

40. The opposite graph represents the relation between the average induced electromotive force (emf) in a metallic ring and the time (t), then the ratio between the magnitudes of the change in the magnetic flux through the ring in the two intervals (x) and (y) respectively is



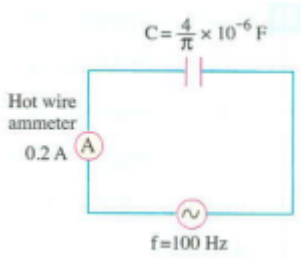
a) 1/3
b) 3/1
c) 2/3
d) 1/6

41. In the opposite figure, the north pole of a bar magnet is moving in the positive direction of the x-axis perpendicular to the plane of a circular metallic ring. Which of the following directions represents the direction of the magnetic field that is generated at the center of the ring due to the induced current?



a) The positive direction of the x-axis.
b) The negative direction of the x-axis.
c) The positive direction of the y-axis.
d) The positive direction of the z-axis.

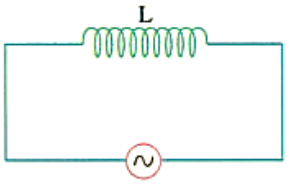
42. The figure represents an electric circuit that contains a hot wire ammeter of ohmic resistance 50 Ω, an AC source and a capacitor. Using the shown data on the figure, the maximum value of the emf of the AC source equals……



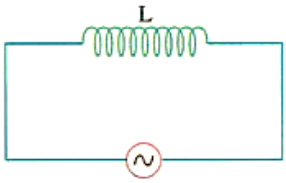
a) 250.19 V b) 353.84 V

c) 194.17 V d) 318.62 V

42. In the figure, an inductive coil of self-inductance (L) and negligible ohmic resistance is



Circuit (1)

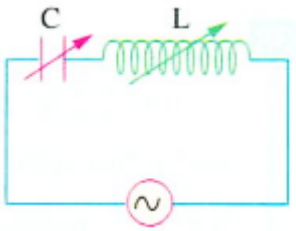


Circuit (2)

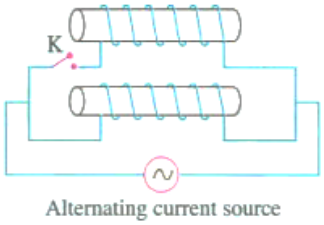
The ratio between : $\frac{\text{the electric current in circuit (1)}}{\text{the electric current in circuit (2)}} =$ ……

a) $\frac{1}{1}$ b) $\frac{2}{1}$ c) $\frac{4}{1}$ d) $\frac{1}{2}$

44. The figure shows a series tuning circuit that consists of variable capacitor and inductor with ohmic resistance. When the capacitance of the capacitor is increased to the double with keeping the same resonance frequency, then the ratio between the inductive reactance in first case to that in second case $\frac{X_{L1}}{X_{L2}} =$……



a) $\frac{1}{2}$ b) $\frac{1}{4}$ c) $\frac{4}{1}$ d) $\frac{2}{1}$



45. The circuit shows two inductors of negligible ohmic resistance connected to an alternating current source. When the key (K) is closed the phase angle between the voltage and the current is .....

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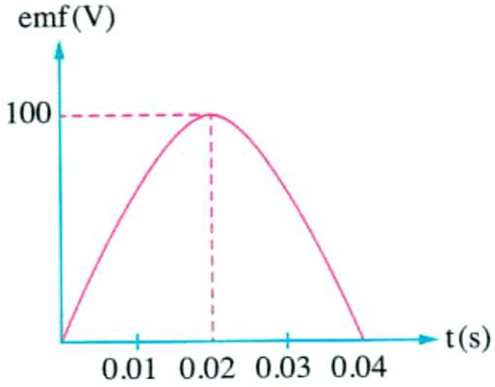
46. The graph represents the relation between the induced electromotive force (emf) in a dynamo coil and time (t) through half cycle, so the average electromotive force generated in the dynamo's coil during the interval of time from t=0 to t=1/75 s equals.....volt



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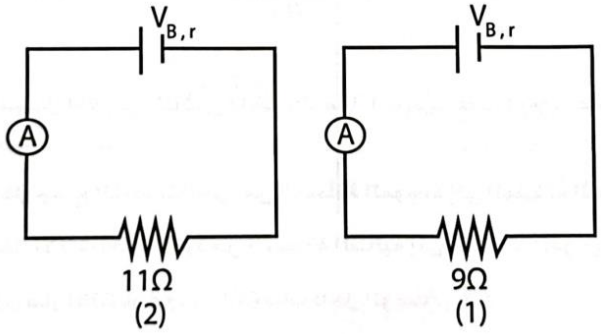
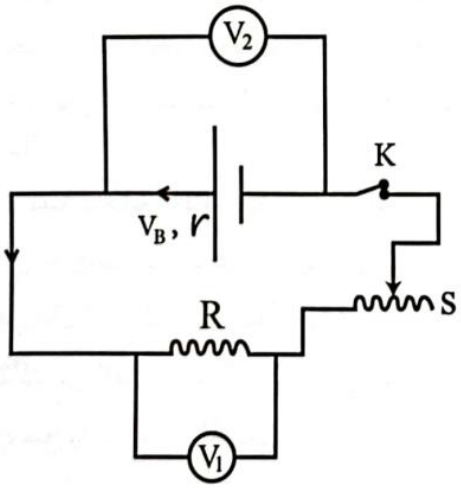
EXAM(3)

1. In the opposite figure, if the ammeter reading in circuit (1) is 1.2A, and 1A in the second circuit, find the internal resistance of the battery.



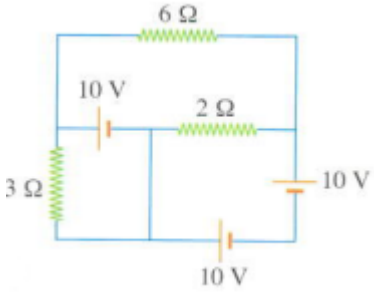
   A. 1Ω
   B. 0.5Ω
   C. 1.5Ω
   D. 2Ω

2. From the opposite figure, which is correct.



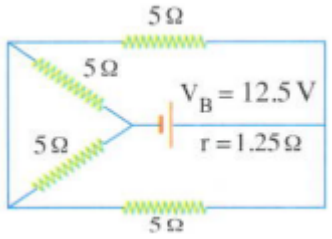
   A. VB>V2
   B. $V_1>V_B$
   C. $V_2=V_B$
   D. $V_1=V_2$

3. The opposite circuit that contains identical electric cells of negligible internal resistance , then the intensity of the current vanishes in ……



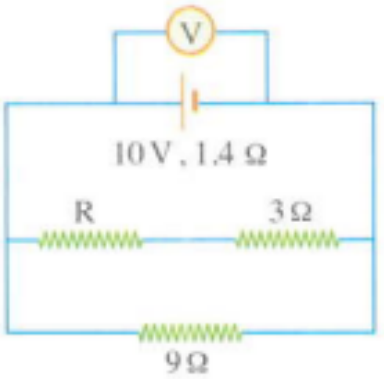
   a) $the\ 6\ \Omega\ resistor$
   b) $the\ 2\ \Omega\ resistor$
   c) $the\ 3\ \Omega\ resistor$
   c) $the\ 6\ \Omega\ , 2\Omega\ resistor$

4. Using the opposite circuit , the intensity of the current which is passing through the battery is .....



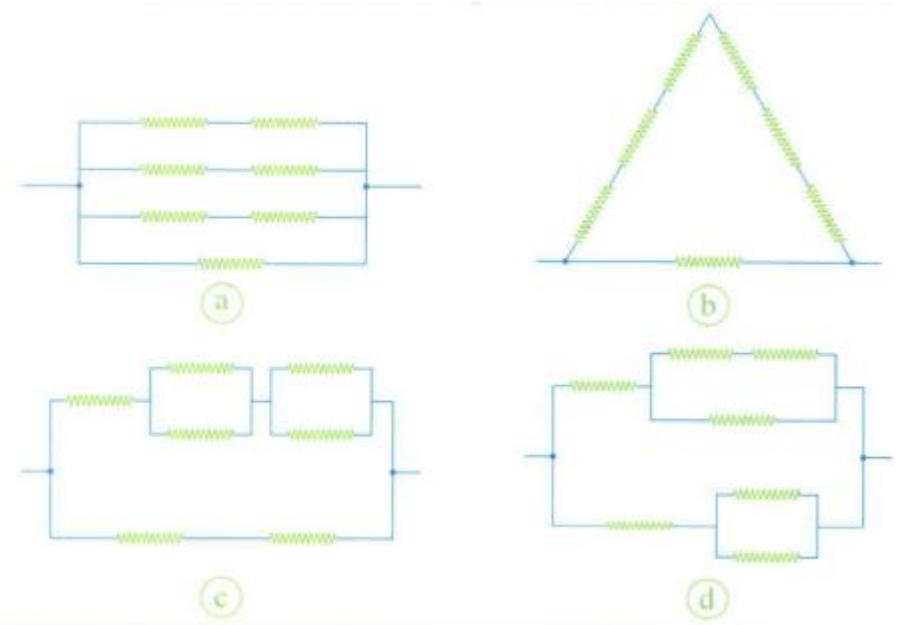
a)0.5A b)1A
c)1.5A d)2A

5. In the opposite electric circuit , if the reading of the voltmeter is 7.2 V , then the value of R equals .....

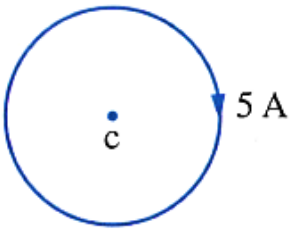


a)1.5 ohm b) 3 ohm
c)4.5 ohm d)6 ohm

6. In each of the following figures , seven equal resistors are connected together then the figure in which the equivalent resistance is equal to the value of one resistor is .....

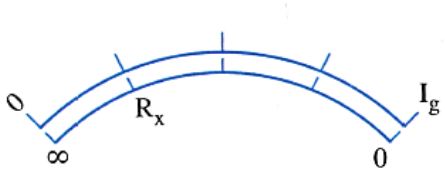


7. In the opposite figure, a circular ring of radius 10 cm carries an electric current of intensity 5 A, then the magnetic flux density at the center of the ring (c) and its direction are.....



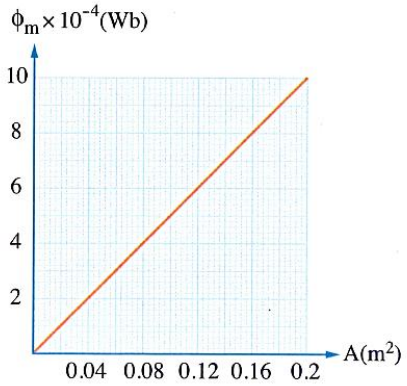
a) 2.6×10^{-5} T, perpendicular out of the page
b) 3.14×10^{-5} T, perpendicular out of the page
c) 3.14×10^{-5} T, perpendicular into the page
d) 2.6×10^{-5} T, perpendicular into the page

8. The opposite figure represents equal divisions on the scale of an ohmmeter. If the total resistance of the ohmmeter is R, then the value of R_x equals…



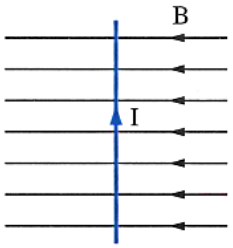
a) 2R b)3 R
c)4R d)6R

9. Several rectangular coils of different areas are placed in a uniform magnetic field where the planes of the coils make an angle of 30° with the direction of the field and the opposite graph represents the relation between the total magnetic flux that passes through the coil (φ_m) and the area of the coil (A), so the magnetic flux density that affects all the coils is……



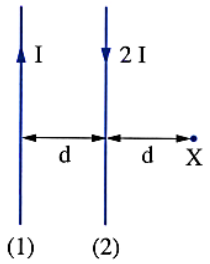
a) 0.05 T b)0.01 T c)0.5 T
d)0.8 T

10. In the opposite figure, a wire of length 2.5 m carries an electric current of intensity 10 A while being placed perpendicular to a magnetic field of flux density 0.3 T, then…….



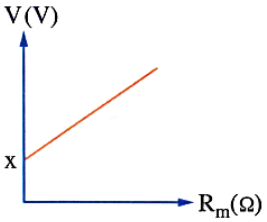
	The direction of the acting force on the wire	The magnitude of the acting force on the wire
(a)	into the page	12.5 N
(b)	into the page	7.5 N
(c)	out of the page	12.5 N
(d)	out of the page	7.5 N

11. The opposite figure shows two long parallel wires where electric currents pass in each one of them. If the magnetic flux density that is generated from the current of wire (1) at point (X) is B, then…….



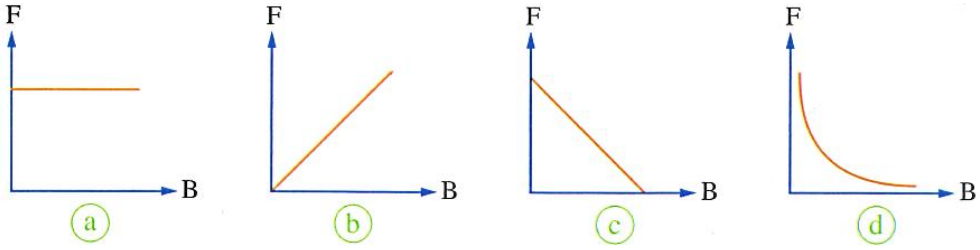
	The resultant magnetic flux density at point (X)	The direction of the resultant magnetic flux density at point (X)
(a)	B	perpendicular into the page
(b)	3 B	perpendicular into the page
(c)	B	perpendicular out of the page
(d)	3 B	perpendicular out of the page

12. The opposite graph represents the relation between the total potential difference (V) between the terminals of a voltmeter and the multiplier resistance (R_m) in the voltmeter, so the quotient of $\frac{x}{slope}$ represents…….

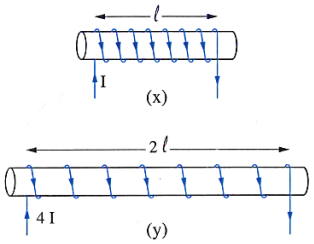


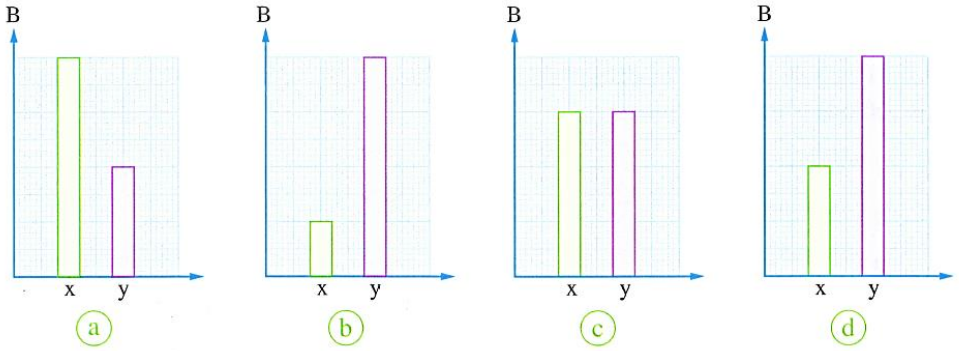
a) R_g b) V_m c) $\frac{1}{I_m}$ d) V_g

13. A straight wire that carries an electric current is placed perpendicularly to a uniform magnetic field of a changeable flux density B which is directed into the page, so the graph that represents the relation between the magnetic force (F) that acts on the wire and the magnetic flux density (B) is…….

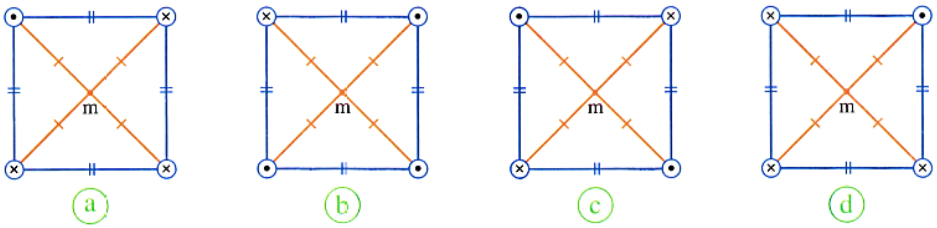


14. The opposite figure shows two current carrying solenoids x and y that have the same number of turns, so the graph that represents the ratios of the magnetic flux density (B) at the axes of the two solenoids is……..





15. If every figure from the following represents four very long wires that are perpendicular to the plane of the page and each of them carries an electric current of intensity I, then the figure in which the resultant of the magnetic flux density at point m vanishes is…



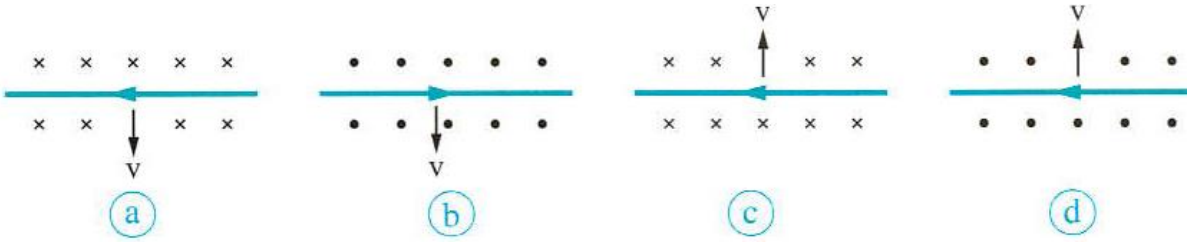
16. The resistance of a galvanometer's coil is 250 Ω, its pointer deflects to the end of its scale when a current of intensity 400 μA passes through it. The galvanometer is connected to an electric cell of emf 1.5 V whose internal resistance is negligible, a constant resistor of 3000 ohms and a variable resistor R_V, then the value of the resistance that should be taken from the variable resistor to convert it into ohmmeter is equal to…….

a) 250 Ω b)500 Ω c)750 Ω d) 3750 Ω

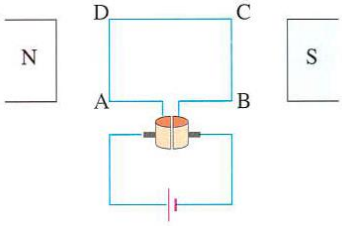
17. A simple electric generator lights an electric bulb of power 60 W and resistance 30Ω hence the maximum electric current intensity passing in the bulb equals ...

a) 2
b) 1
c) 0.5
d) $\sqrt{2}$

18. The following figures represent four straight wires (A), (B), (C) and (D). Each one is connected to a closed electric circuit while moving at velocity v in a uniform magnetic field. In which of these figures the direction of the induced current is represented correctly



19. The figure illustrates the structure of a simple electric motor. When the coil rotates from the parallel position, the force acting on wire AD.



a) remains maximum
b) remains zero
c) increases from zero to the maximum value.
d) d)decreases from the maximum value to zero

20. Graph no. (1) represents the growth of electric current in an inductor of inductance L that is connected to a battery at the instant of switching on the circuit- Which of the following curves represents the growth of current if a soft iron core exists inside the coil at the moment of switching on the circuit?

a) Curve 1
b) Curve 2
c) Curve 3
d) Curve 4

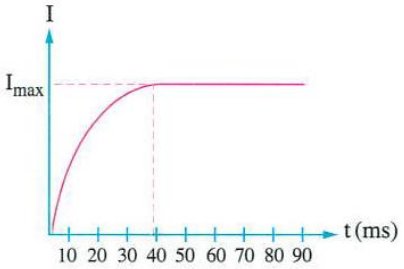


Figure (1)

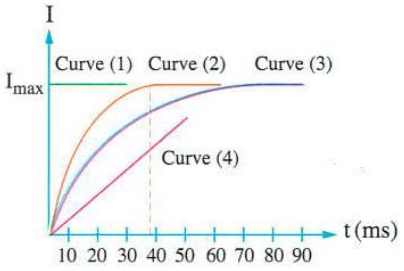
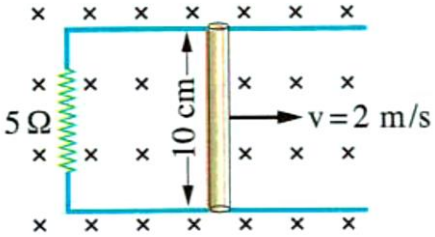


Figure (2)

21. The figure represents a conductor moving perpendicular to a magnetic field of flux density 0.2T, using the data on the figure, the passing current in the resistor equals ……

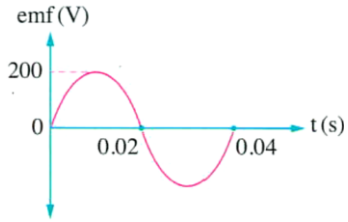
a) 4mA
b) 8mA
c) 6mA
d) 2mA



22. When the magnetic flux interacting with a circular coil change, an induced electromotive force (E) is produced in the coil. If the number of turns of the coil is increased to four times at constant area and the rate of change of the magnetic flux interacting with the coil is decreased to its half, then the induced electromotive force will equal .....

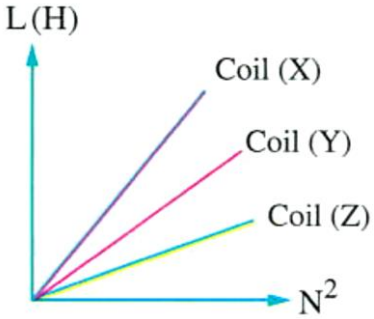
a) 2E
b) 4E
c) 0.5E
d) 0.25E

23. The graph represents the relation between the induced electromotive force (emf) in the dynamo and time (t). From the figure, the average induced electromotive force of the dynamo coil through interval time of time from t=o to t=1/30 s equals ……..



a) 127.4V
b) 42.5V
c) 173.2V
d) 19.1V

24. Three solenoids (X), (Y) and (Z) have the same cross-sectional area while the number of tums of each solenoid can be changed. The graph represents the relation between the inductance (L) and the square of the number of tums (N2) in each solenoid, from the graph, which one from the following is the correct arrangement concerning the lengths (l) of the solenoids?

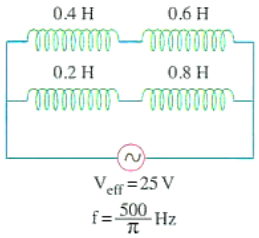


(a) $\ell_X > \ell_Y > \ell_Z$ (b) $\ell_Y > \ell_X > \ell_Z$
(c) $\ell_Z > \ell_Y > \ell_X$ (d) $\ell_Z > \ell_X > \ell_Y$

25. a metallic ring falls vertically through a magnetic field perpendicular to its plane through a time interval 0f 0.4s. what is the change in the magnetic flux which cuts the ring if an average induced electromotive force of $5 \times 10^{-3} V$ is generated through this interval?

a) $2 \times 10^{-3} Wb$
b) $3 \times 10^{-3} Wb$
c) $4 \times 10^{-3} Wb$
d) $5 \times 10^{-3} Wb$

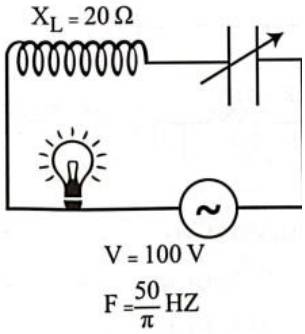
26. According to the shown electric circuit, the effective value of the alternating current in the circuit is.....



a) 0.05 mA b) 0.5 mA

c) 5 mA d) 50 mA

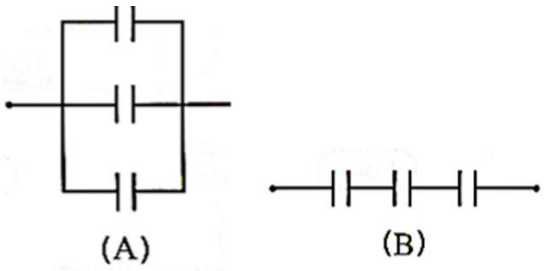
27. In the opposite figure what is the capacity of capacitor when lighting of lamp is maximum?



a) 2.5×10^{-4}F b) 10×10^{-4}F

c) 5×10^{-4}F d)15×10^{-4}F

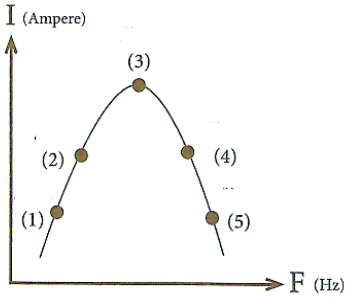
28. Three capacitors are connected as shown in the figure a capacitance of each of them is 12μF connected with alternative source its voltage is 20V, so $\frac{Q_A}{Q_B}$= .....



a) $\frac{9}{1}$ b) $\frac{1}{9}$

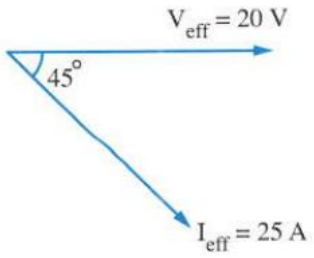
c) $\frac{3}{1}$ d)$\frac{1}{3}$

29. An alternating circuit has an ohmic resistance and inductive coil with non ohmic resistance and capacitor with variable capacity ,so which points have potential difference between terminals of capacitor is greater than potential difference between terminals of coil .....



a) 2,3 b) 4,5 c) 1,2 d) 2,4

30.The opposite figure shows the phasor diagram of the total voltage and the electric current intensity in an AC circuit, then this circuit could be



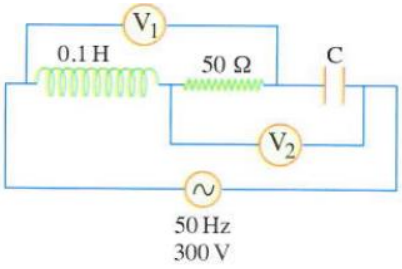
a) RC or RLC

b) RLC only

c) RC or RL

d) RLC or RL

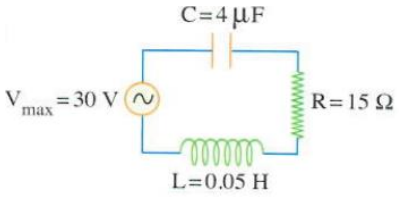
31.The opposite electric circuit, if the ratio between the readings of the two voltmeters $(\frac{V_1}{V_2})$ is $\frac{1}{2}$, then the capacitance of the capacitor (C) is approximately equal to



a) 60 µF b) 15 µF

c) 30 µF d) 7.5 µF

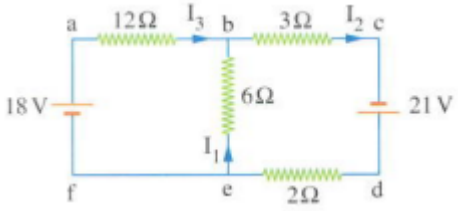
32.The opposite circuit is in a state of resonance, then the consumed electric power from the source is .....



a)0 b) 2W c) 30 W d) 60 W

→ questions from 33:46 (2 marks):

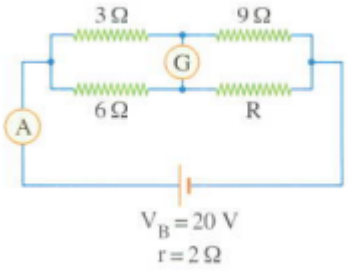
33. In the opposite electric circuit, the value of I_1 is .....



a)0.5A b)1A

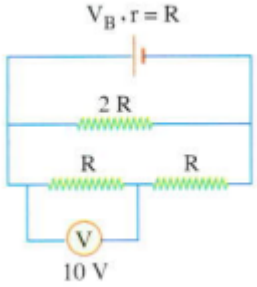
c)2A d)3A

34. In the opposite electric circuit, if the pointer of the galvanometer has stopped at zero, then the resistance R equals …….



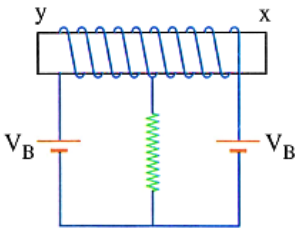
a)12Ω b)15Ω
c)16Ω d)18Ω

35. *In* the opposite circuit, the value of V_B *is* ……..



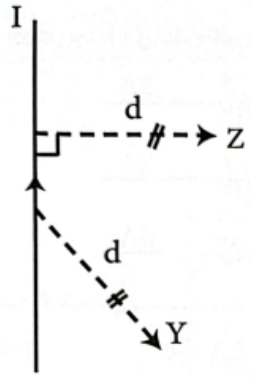
a)10V b)20V
c)30V d)40V

36. In the opposite circuit, a solenoid is connected to a resistor and two identical batteries, each of electromotive force V_B and of negligible internal resistance, then……..



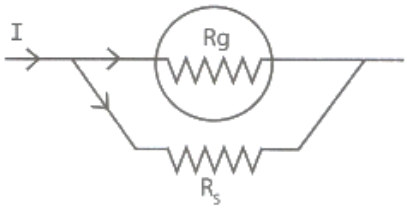
	The magnetic pole which is formed at x	The magnetic pole which is formed at y
(a)	north	north
(b)	north	south
(c)	south	north
(d)	south	south

37. the opposite figure represents a straight wire carry an electric current (I) , which of the following choices represents the relation between magnetic flux density at point (Z) and (Y) ?



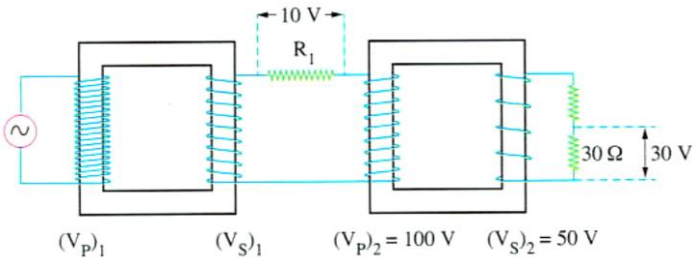
a) $B_Y = B_Z$ and in opposite direction
b) $B_Y = B_Z$ and in same direction
c) $B_Z > B_Y$ and in opposite direction
d) $B_Z < B_Y$ and in the same direction

38. in the opposite figure if we changed the value of shunt resistance, so the sensitivity will increase with passing the same value of the current (I) which of the following ratios will increase ?



a) $\frac{I_g}{I_s}$
b) $\frac{V_g}{V_s}$
c) $\frac{Rg}{R_T}$
d) $\frac{R_g}{R_s}$

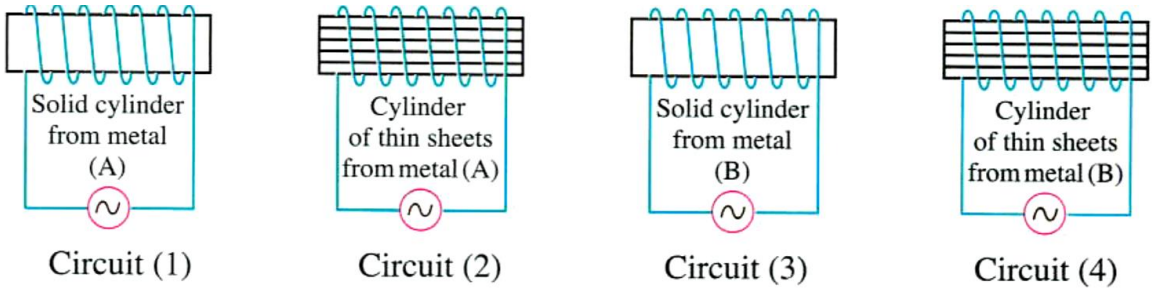
39. Two ideal electric transformers are connected together as shown in the figure. Using the shown data in the figure, the consumed electric power in the resistance (R_1) equals…….



a) 10watts
b) 50watts
c) 55wats
d) 5watts

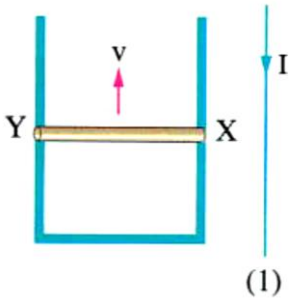
40. The figure shows 4 similar AC circuits if you know that the resistivity of metal (A) is greater than the resistivity of metal (B). In which electric circuit, the metal cylinder has the greatest generated eddy current?

a) circuit 1
b) circuit 2
c) circuit 3
d) circuit 4



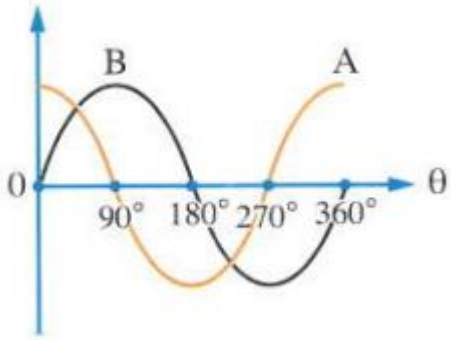
Circuit (1) Circuit (2) Circuit (3) Circuit (4)

41. the figure shows a straight current-carrying wire (1) through which a current of intensity (I) passes. When a wire (XY) is moved upwards in the magnetic field due to the electric current of wire (I) with velocity (v), an induced electric current is generated in it from (X to Y). To decrease the intensity of the induced electric current to half its value. we must……..



a) increase the velocity of wire (XY) to its double.
b) decrease the electric current intensity in wire (I) to its quarter.
c) increase the velocity of wire (XY) to its four times.
d) decrease the electric current intensity in wire (I) to its half.

42. AC circuit contains an ohmic resistor, a capacitor and an inductor of zero resistance, all are connected in series with an AC source of changeable frequency. If curve A represents the current in the circuit, so curve B represents the voltage across



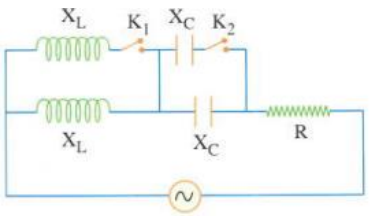
a) the capacitor

b) the ohmic resistor

c) the inductor

d) the source while the circuit in a state of resonance

43. The opposite electric circuit, if the phase angle between the total voltage and the current is 36.87°, then the reading of the hot wire ammeter equals



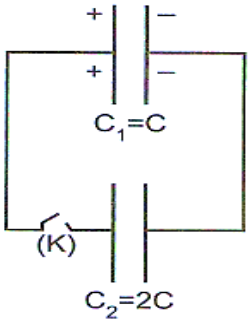
a) 2.25 A

(c) 1.75 A

(b)2 A

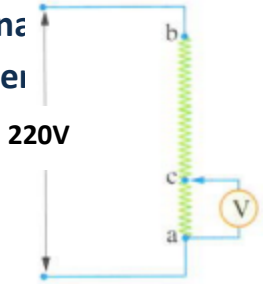
(d) 1.5 A

44. In the opposite figure two capacitors (1) ,(2) , capacitor (1) is charged and its charge is $60\mu c$ and capacitor (2) is non charged .when close switch (K) ,so……..



	Q_1	Q_2
a)	$40\mu c$	$20\ \mu c$
b)	$20\ \mu c$	$40\ \mu c$
c)	$30\ \mu c$	$30\ \mu c$
d)	0	μc 60

45. In the opposite circuit , there is a resistance ab of 12 KΩ where it's termina connected to a potential difference of 220V . if the section ac that represe resistance ab is connected to a voltmeter of resistance 6 kΩ , so the vo equals …….



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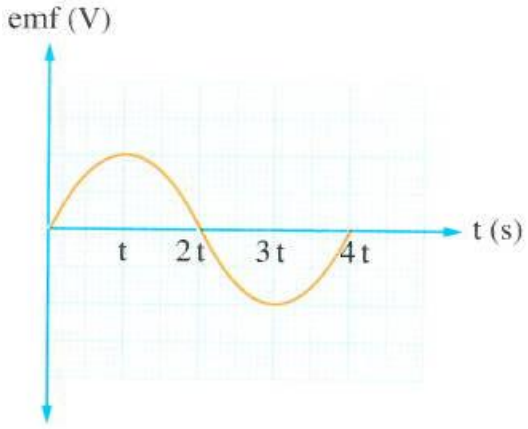
46. The opposite graph represents the relation between the generated electromotive force (emf) in an AC dynamo's coil within a complete cycle and time (t), then the value of the average electromotive force within the time interval from t to 2 t is greater than the value of the average electromotive force within the time interval…….



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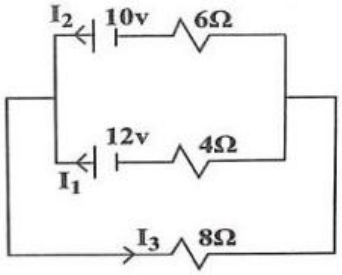
EXAM(4)

1. In the shown electric circuit, the value the intensity of electric current passing through the 8 Ω resistor equals .....



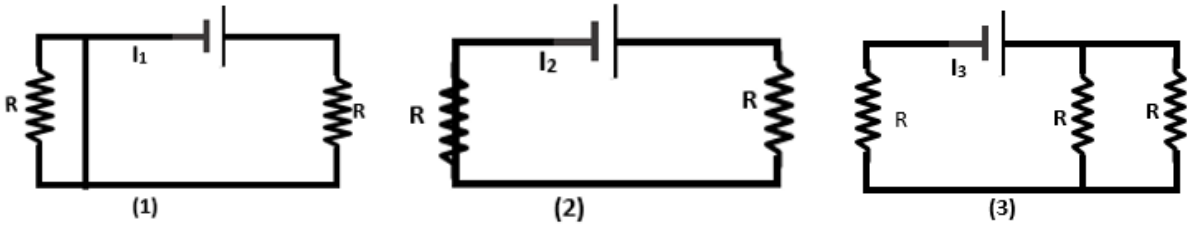
a) 0.23 A b) 0.846 A

c) 1.076 A d) 0.306 A

2. Two electric resistors, the resistance of the first is three times as that of the second. When they are connected in parallel gives an equivalent resistance 3Ω then, when they are connected in series gives .....

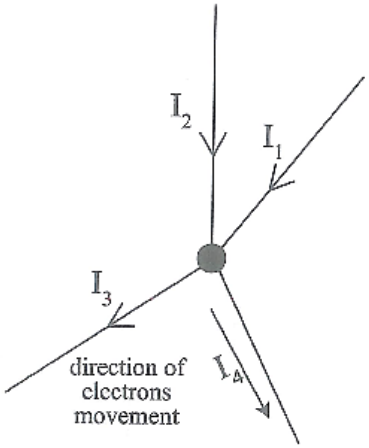
a) 12 Ω b) 16 Ω c) 8 Ω d) 4 Ω

3. you have 3 electric circuits 1,2,3 which of the following relations is correct?



a) $I_1=I_2$ b) $I_1 > I_3$ c) $I_2 > I_3$ d) $I_3 > I_1$

4. The figure shows a part of a closed electric circuit If the directions of I_1, I_2, and I_3 represent the conventional currents while I_4 represents the direction of the electrons movement. So, the intensity of current (I_3) = ...



a) $I_1 + I_2 - I_4$

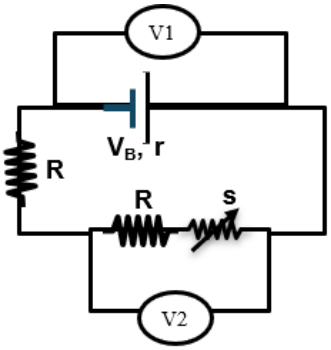
b) $I_1 + I_2 + I_4$

c) $I_4 + I_1 - I_2$

d) $I_4 + I_2 - I_1$

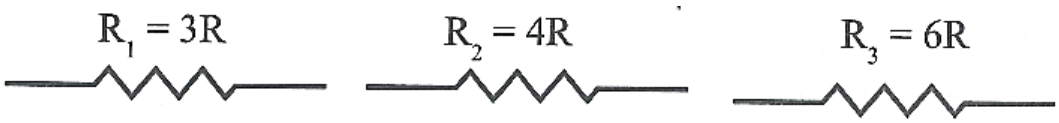
5. In the shown electric circuit: On increasing the value of the variable resistance (S) .

Which choice correctly represents the change in the reading of voltmeters (V_1) and (V_2) ?



	V_1	V_2
(a)	Increases	Increases
(b)	Remains constant	Increases
(c)	Decreases	Remains constant
(d)	Decreases	Decreases

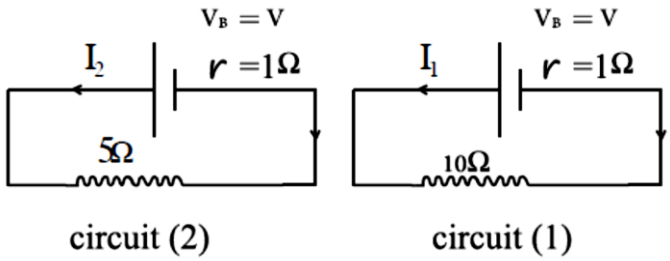
6. Three resistors R_1, R_2, R_3 as shown in the figure. When they are connected in parallel gives an equivalent resistance 4Ω then, when they are connected in series gives .....



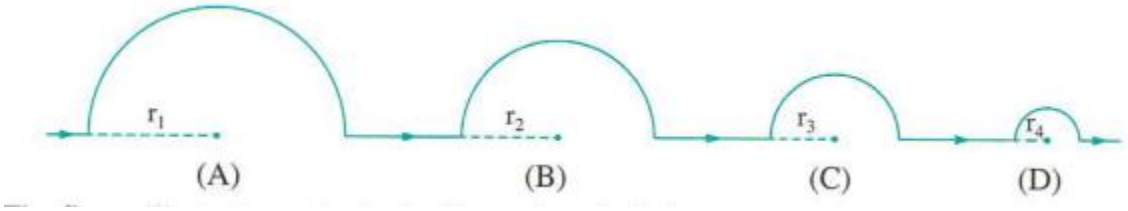
a) 9 Ω b) 27 Ω c) 13 Ω d) 39 Ω

7. In the figure, then the ratio $\frac{I_1}{I_2}$ equals.....

a) $\frac{6}{11}$
b) $\frac{1}{2}$
c) $\frac{5}{12}$
d) $\frac{4}{9}$



8. The figure illustrates a wire in the form of semi-circles connected together and connected to a cell. Which of these semi-circles has the least magnetic flux density at its center?



a) (A) b) (B) c)(C) d)(D)

9. An ohmmeter was connected with an external resistor (x) of resistance 400Ω , so its pointer deflected to $\frac{3}{4}$ of the galvanometer scale .If (x) is replaced with another resistor (y) of 6000 O, the pointer deflects to ..... of the galvanometer scale.

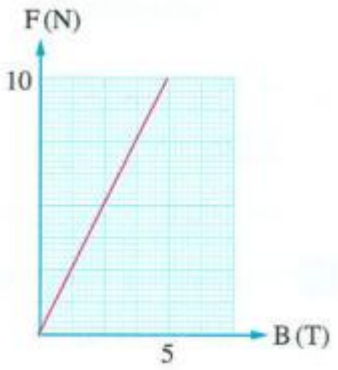
a) $\frac{1}{6}$ b) $\frac{3}{5}$ c) $\frac{1}{5}$ d) $\frac{5}{6}$

10. A circular coil of 30 tums and cross-sectional area 10 cm^2 is placed in a magnetic field of flux density 0.3 T while carrying a curent of 2 A. Knowing that the direction of the magnetic dipole moment of the coil makes an angle of 30" with the direction of the magnetic field, so the magnitude of the magnetic torque that affects the coil is .....

a) $18\sqrt{3} \times 10^{-3}\mathrm{N.m}$ b) $18 \times 10^{-3}\mathrm{N.m}$

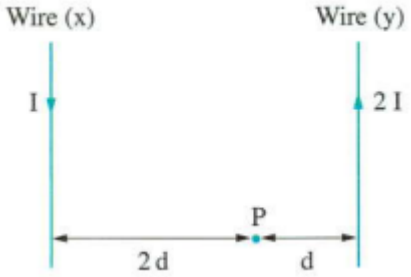
c) $9 \times 10^{-3}\mathrm{N.m}$ d) $9\sqrt{3} \times 10^{-3}\mathrm{N.m}$

11. The graph represents the relation between magnetic force (F) acting on a current-carrying wire when it is placed perpendicular to a changing magnetic field and the magnetic flux density (B) of the field, so the magnetic force acting on the wire when the magnetic flux density equals 3 T will be ... .newtons.



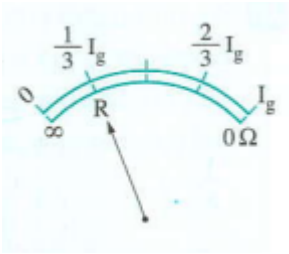
a) 6
b) 4
c) $\frac{1}{2}$
d) 2

12. In the shown figure, the resultant magnetic flux density at point P due to the two electric currents that are passing through the two wires (x) and (y) is B_t, so if the direction of the passing current through wire (x) is reversed while keeping the current of (y) as it is, the resultant magnetic flux density at point P becomes ....



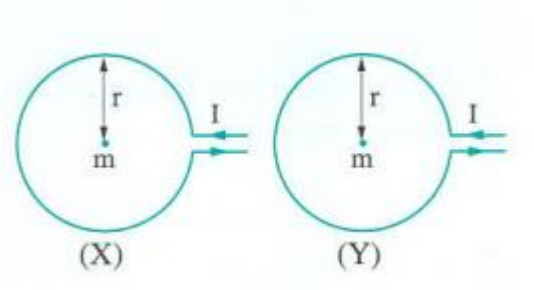
a) $\frac{3}{7}B_t$
b) $\frac{2}{3}B_t$
c) $\frac{3}{5}B_t$
d) $\frac{3}{8}B_t$

13. The opposite figure represents the scale of a galvanometer in an ohmmeter, when it is connected with external resistance R, the pointer has deflected to $\frac{1}{3}I_g$, so the resistance of the device equals .....



a) R b) 2R c) 0.5R d) 3R

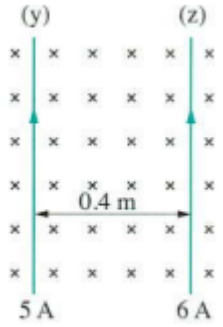
14. In the opposite figure, two circular coils (X) and (Y) having the same diameter while electric currents of the same intensity pass through each of them. If the number of turns of coil (X) is double the number of tums of coil (Y), which of the following relations represents correctly the relation between the produced magnetic flux densities at the center of each coil?



a) $B_x = B_y$ b) $B_x = \frac{1}{2}B_y$

c) $B_x = 2B_y$ d) $B_x = 4B_y$

15. The figure shows two parallel straight wires (z), (y) separated by a normal distance of 0.4 m, carrying electric currents of intensities 6 A and 5 A respectively and being affected by external magnetic field of flux density 2.5 x 10^{-5} T perpendicular into the page as shown irl the figure, so the net magnetic force that affects unit length of the wire (z) equals .....

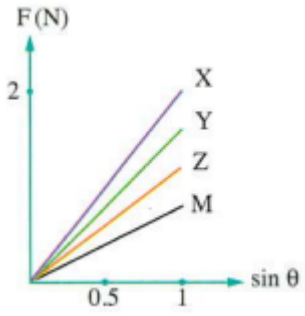


a) $1.5 \times 10^{-5}\ N/m$
b) $1.5 \times 10^{-4}\ N/m$
c) $1.7 \times 10^{-4}\ N/m$
d) $4 \times 10^{-5} N/m$

16. Galvanometer measures 0.1 volt of maximum potential difference when a maximum current of 2 mA passes in it, each division of its scale indicates 0.01 V, if it is connected to a multiplier resistance of 450 ohm , each division will indicate.....

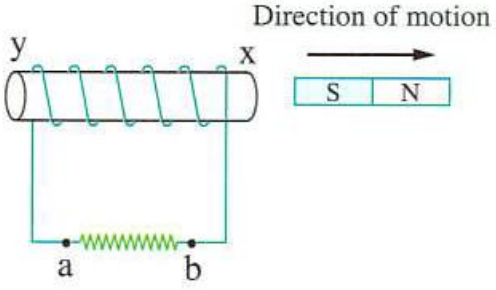
a) 0.01V b) 1V c) 0.1V d)0.001V

17. (X), (Y), (Z) and O0 are four straight wires that are different in length, each carries electric current of intensity I and all are placed in the same magnetic field of flux density B. The graph represents the relation between the magnetic force (F) that affects each wire and sine of the angle between each wire and the direction of the magnetic flux (sin θ). So, the longest wire is…….



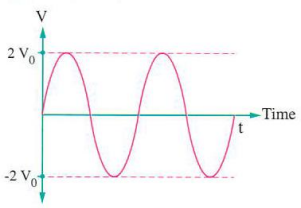
a) Wire (X)
b) Wire (Y)
c) Wire(Z)
d) Wire (M)

18. In the opposite figure, as the magnet moves in the shown direction, which of the following choices becomes correct?

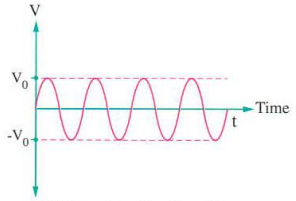


a) End Y of the coil acts as a north pole and point (a) has a negative potential.
b) end X of the coil acts as a north pole and point (b) has a positive potential.
c) end X of the coil acts as a south pole and point (a) has a positive potential.
d) End Y of the coil acts as a south pole and point (a) has a negative potential.

19. Each graph represents the number of voltage cycles generated by different dynamos (x) and (y) during the same time interval (t). If the two coils of the dynamos (x) and (y) have the same cross-sectional area and rotate in a magnetic field of the same strength, the ratio of number of turns of coil Y to number of turns of coil X.



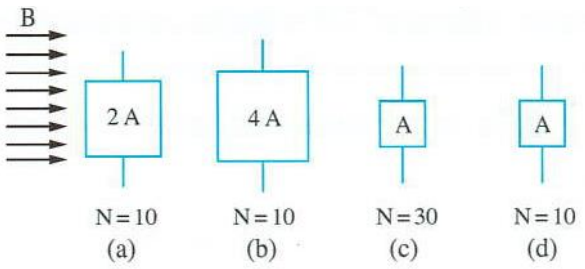
The produced voltage from dynamo's coil (x)



The produced voltage from dynamo's coil (y)

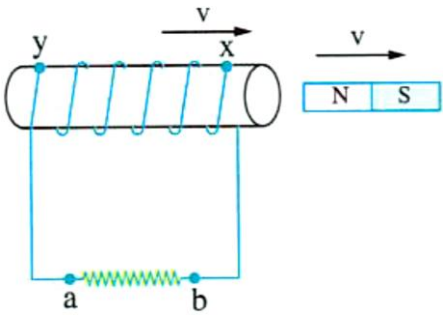
a) 1/6
b) 1/8
c) 1/4
d) 1/2

20. The figure represents four rectangular coils of different cross- sectional area where the number of tums and areas are labelled. All coils rotate with the same angular velocity about an axis that is normal to the direction of a magnetic field (B), so the ascending arrangement of the coils according to the maximum value of the induced emf in each of them is.....



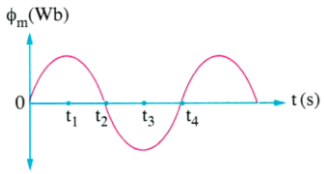
a) b , c , a ,d
b) d , a , c ,b
c) c , a , b ,d
d) a , d , b ,c

21. A magnet is moving as shown in the figure, if the coil is moved with the same velocity and in the same direction as the magnet, so.....



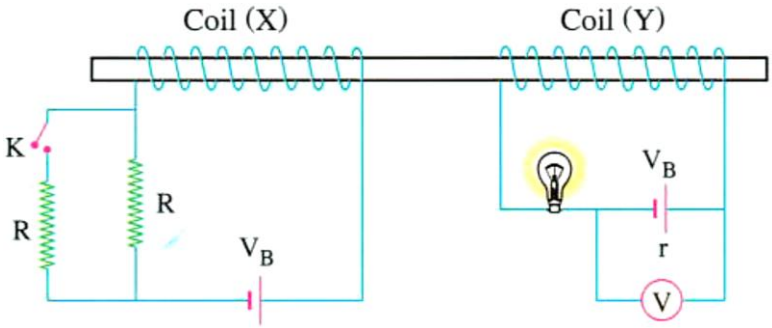
a) the potential of point (a) is greater than the potential of point (b)
b) the potential of point (x) is less than the Potential of point (y)
c) the potential of point (x) is greater than the potential of point (y)
d) the potential of point (a) equals the potential of point (b)

22. The opposite graph represents the relation between the change of magnetic flux through a rectangular coil with time, so the instantaneous induced electromotive force equals zero at the points.....



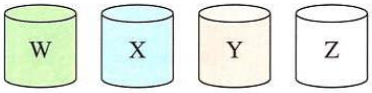
a) t_1, t_3
b) t_2,t_4
c) t_1,t_2
d) t_1,t_4

23. The figure illustrates two adjacent coils (X), (Y). So, at the instant of switching on the key (K) in the circuit of coil (X),then……



a) the illumination of the bulb decreases while the voltmeter reading increases.
b) the illumination of the bulb increases while the voltmeter readil1g decreases.
c) both the illumination of the bulb and the voltmeter reading decreases
d) both the illumination of the bulb and the voltmeter reading increases

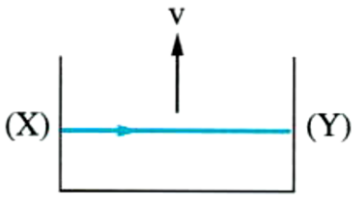
24. The figure shows four metallic cylinders of the same dimensions but of different metals. The table illustrates the values of the electrical conductivity for these metals. Where the cylinders are exposed to the same variable magnetic flux resulted from an alternating current source, so when neglecting the differences in the magnetic permeability of these metals, in which cylinder the amount of heat energy generated due to the eddy currents will be the least.



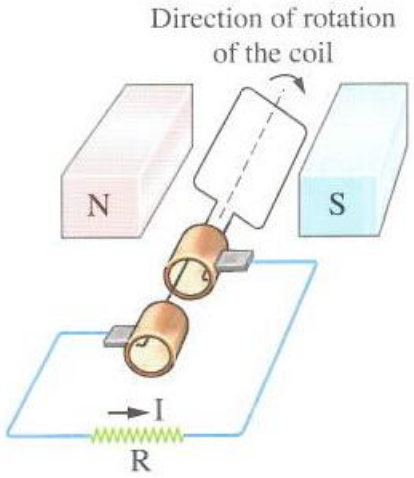
Metal	Electrical conductivity
W	$5.96 \times 10^7\ \Omega^{-1}.m^{-1}$
X	$3.5 \times 10^7\ \Omega^{-1}.m^{-1}$
Y	$2.98 \times 10^7\ \Omega^{-1}.m^{-1}$
Z	$0.217 \times 10^7\ \Omega^{-1}.m^{-1}$

a) W
b) X
c) Y
d) Z

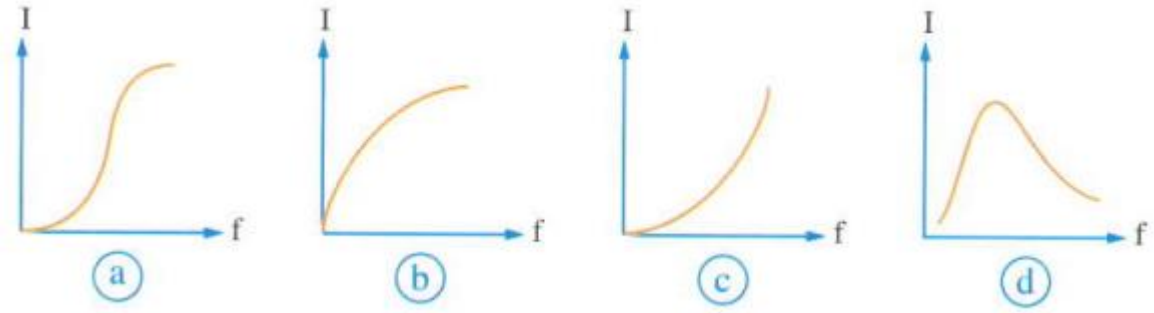
25. The figure represents a part of closed circuit that contain a straight wire (XY) that is placed in the same plane of the paper and moving upward with velocity v producing an induced current that passes from (X) to (Y). Which figure represents the direction of magnetic flux acting on the wire according to the plane of the paper?



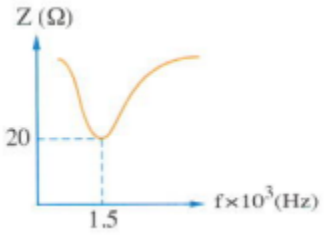
26. Starting from the position that is shown in the opposite figure for an AC dynamo, through one and a half cycle of the coil, the current I that passes through the resistance R reaches its maximum value
    a) twice
    b) three times
    c) four times
    d) five times



27. An RLC circuit contains an AC source of constant effective voltage and changeable frequency, then which of the following curves represents the change of the effective value of the current through the circuit with respect to the change of the frequency of the source?



28. An AC circuit consists of a resistor, a capacitor and an inductor that are connected in series to an AC source of changeable frequency and the opposite graph represents the relation between the impedance (Z) of the circuit and the frequency of the current (f), so the value of the ohmic resistance for this circuit equals……..



a) $1.5\ \Omega$ b) $5\ \Omega$ c) $10\ \Omega$ d) $20\ \Omega$

29. RLC circuit contains AC source of changeable frequency and constant value of effective voltage. The circuit is in a state of resonance. When its frequency increases, the effective value of the current in the circuit.

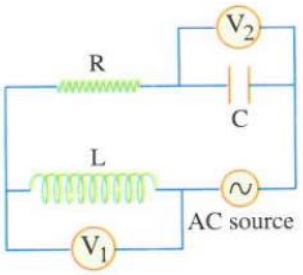
a) remains constant

b) decreases

c) increases

d) may decrease or increase

30. The shown electric circuit, if the phase angle between the total voltage and the current equals zero, what happens to the ratio $\frac{V_1}{V_2}$ when the frequency of the source increases?



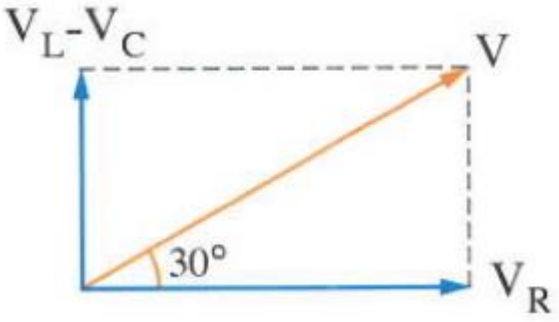
a) Increases

b) Decreases

c) Increases then decreases

d) Decreases then increases

31. The opposite figure illustrates the voltage phasor diagram for an RLC circuit, then the total impedance equals……



a) $\frac{R}{2}$

b) $\frac{2\sqrt{3}\,R}{3}$

c) R

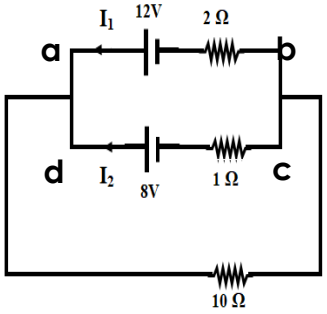
d) $2R$

32.In a hot wire ammeter when replacing this shunt resistance with anther resistance its value is less than first with constant effective value of electric current in the circuit ,so…….

	Thermal energy which produced in (platinum-iridium) wire	Total resistance for ohmmeter
a)	Decrease	Increase
b)	Decrease	Decrease
c)	Increase	Decrease
d)	Increase	Increase

→ questions from 33:46 (2 marks):

33.In the circle shown in the figure:



Kirchhoff's second law can be applied, in the closed path (adcba) as follows …….

A) $2I_1+I_2+4 = 0$ **B)** $2I_1 - I_2 - 20 = 0$

C) $2I_1 - I_2 - 4 = 0$ **D)** $3I_1 - I_3 + 4 = 0$

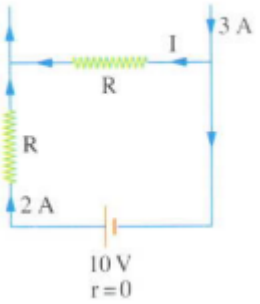
34.The opposite diagram represent a section of electric circuit that carries an electric current , then the current intensity I and the value of R respectively are .....

A)1A , 3.3 ohm

b)1A , 10 ohm

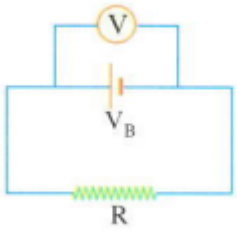
c) 5A , 3.3 ohm

d)5A , 10 ohm



35.In the opposite electric circuit , if the internal resistance of the battery is $\frac{1}{5}R$, then the reading of the voltmeter is .....

a)$\frac{2}{3}V_B$ b)$\frac{1}{5}V_B$ c)$\frac{4}{5}V_B$ d)$\frac{5}{6}V_B$



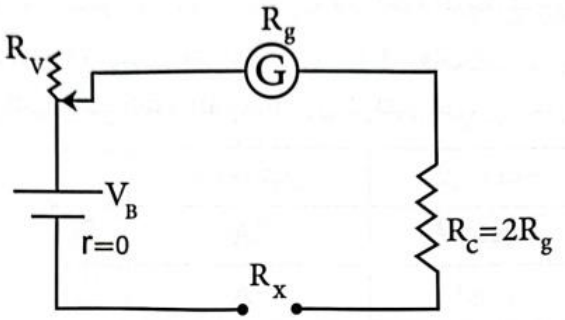
36.The opposite figure represents an ohmmeter contains a galvanometer its resistance is R_g when connect an external resistance Rx =15Rg the pointer of galvanometer will deflect to 1/5 from its scale ,so the value of R_v=.....

a) 3.75Rg

b) 0.75Rg

c) 0.25Rg

d) 3.25Rg



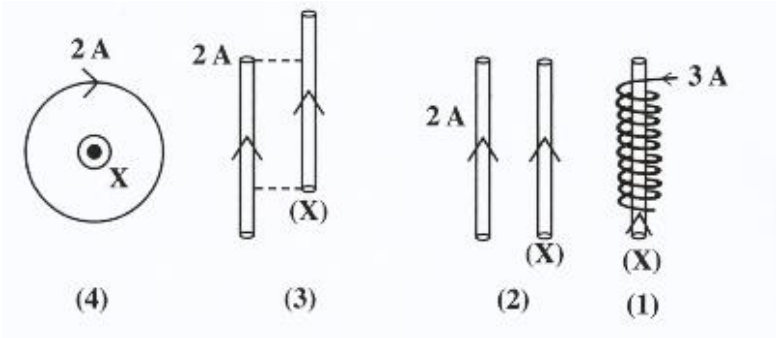
37. A wire (X) passes through it electric current (I) is placed on different magnetic fields as shown in the figures which of the following represents the correct arrangement for magnetic force affected on a wire according each shape ?

a) $F_2 > F_3 > F_1 = F_4$

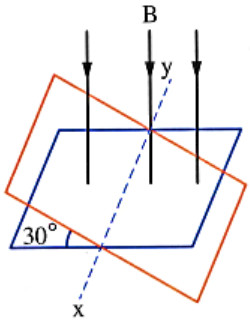
b)$F_2 = F_3 > F_1 = F_4$

c)$F_1 > F_2 > F_3 > F_4$

d)$F_1 > F_2 = F_3 = F_4$



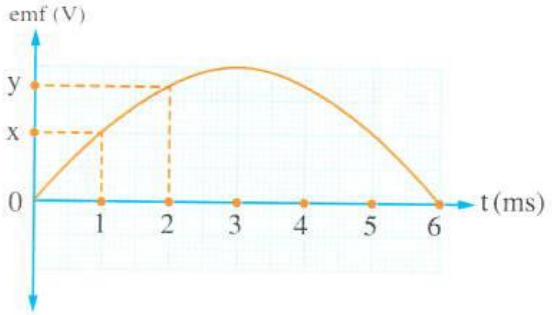
38. In the opposite figure, a coil is placed perpendicular to a uniform magnetic field of flux density B, so the magnetic flux that penetrates the coil is φm, if the coil has rotated from this position by an angle of 30° about the xy axis, then the magnetic flux that penetrates the coil becomes…….



a) $\frac{\sqrt{3}}{2}\phi m$ b) $\frac{1}{2}\phi m$

c) 1/3ϕ d) 3 ϕm

39. The opposite graph represents the change in the induced (emf) in the coil of an AC dynamo through half cycle, then the ratio equals…….



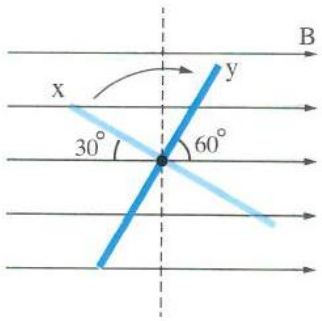
a) $\frac{1}{2}$

b) $\frac{1}{3}$

c) $\frac{\sqrt{2}}{2}$

d) $\frac{\sqrt{3}}{3}$

40. The opposite figure represents a dynamo's coil that rotates with a uniform velocity about an axis that is perpendicular to a uniform magnetic field, so the ratio between the generated electromotive force in the coil at position x and the generated electromotive force in the coil at position y.



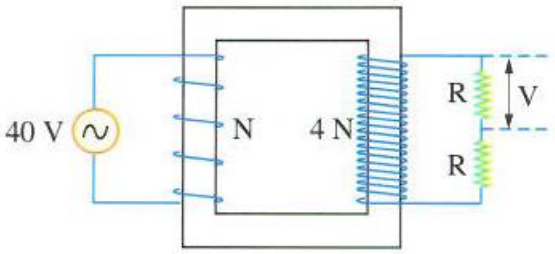
a) $\frac{\sqrt{3}}{1}$

b) $\frac{\sqrt{2}}{1}$

c) $\frac{1}{\sqrt{2}}$

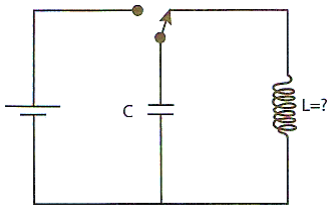
d) $\frac{1}{\sqrt{3}}$

41. The opposite figure shows an ideal transformer whose secondary coil is connected to two resistors which are connected in series where the resistance of each of them is R. If the number of turns of the secondary coil is four times that of the primary coil, then the potential difference across resistor R equals



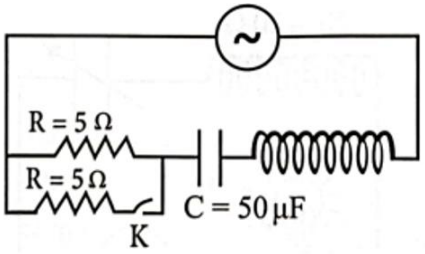
a) 20V
b) 30V
c) 40V
d) 80V

42. The opposite figure represents a ringing circuit contains a capacitor its capacity is C=200μF ,so what is the value of self-induction coefficient (L) when frequency is 100HZ?



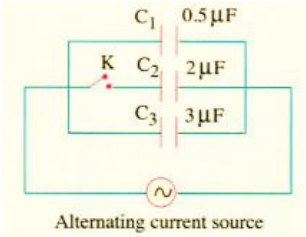
a) 12.68H
b) 0.0127H
c) 78.75H
d) 1.267×10^{-8}H

43. The opposite figure represents an alternative circuit its frequency is 50HZ if inductive reactance of a coil equals 63.63Ω , when closing switch (K) ,so……



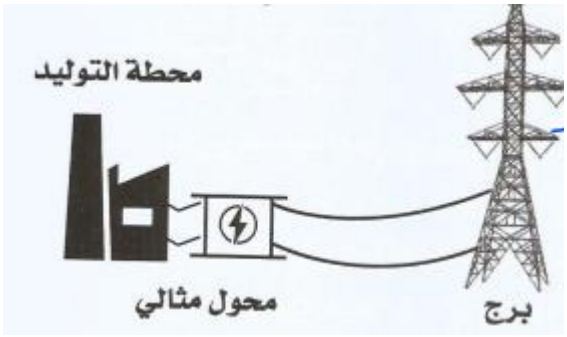
a) V lags I by angle 90^0
b) V leads I by angle 45^0
c) V lags I by 45^0
d) V and I have the same phase

44. From the opposite electric circuit, the ratio between the total capacitance of capacitor before closing the key (K) and after closing it equals .....



a) $\frac{7}{11}$
b) $\frac{11}{7}$
c) $\frac{6}{1}$
d) $\frac{1}{6}$

45. Through transferring electric energy from a power station of potential (25×10^3)V The potential difference at one of the transition towers 132×10^3 V, if the cables resistances between the tower and transformer is 7500Ω and the value for the current passing in them is 2A



Calculate :

1. The potential difference between the two terminals of the secondary coil
2. The current passing in the primary coil of the transformer

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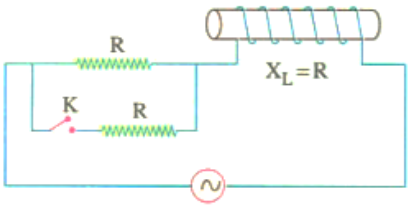
46. The figure represents a part of electric circuit which connected with an alternating current source. What will happen for the phase angle between the total voltage and the total current at closing key (K)? Explain your answer.



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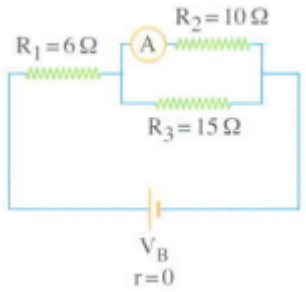
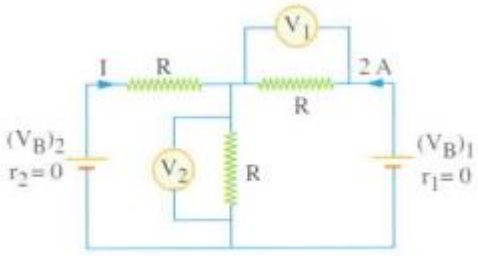
EXAM(5)

1. In the opposite electric circuit , if the ammeter reading is 0.75A , the electromotive force of the battery equals ……..



a)7.5V b)10V
c)12V d)15V

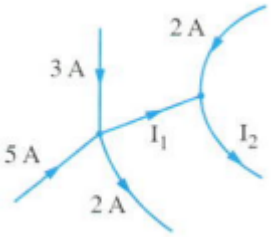
2. In the opposite diagram if $V_2 = 3V_1$, then the value of I equals …….



a)3A b)4A
c)6A d)8A

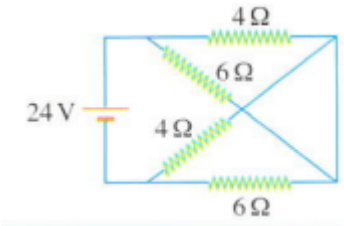
3. In the electric network , the value of $I_1 and\ I_2$ are

	I_1	I_2
a	3 A	8 A
b	3 A	5 A
c	6 A	14 A
d	6 A	8 A



4. In the electric circuit shown in the figure , the current intensity of the source is …….

a)1.2A b)1.5A c)2.4A d)5A



5. When 18 identical lamps each of power 18W , are connected in parallel with a source of voltage 120V , then the current that passes in the source is equal to .....

a)5.4A b)4.5A

c)3.6A d)2.7A

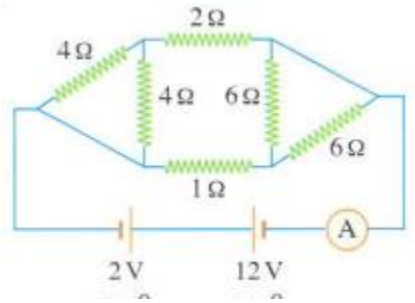
6. In the electric circuit shown in the figure , the reading of the ammeter .....

a)4A

b)4.5A

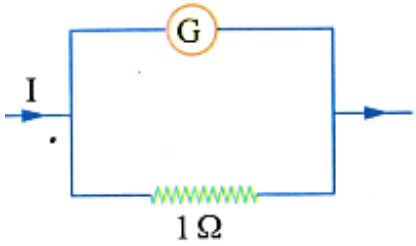
c)5A

d)5.5A



7. In the opposite figure, the resistance of the galvanometer's coil is 19Ω when it is connected to a shunt resistance of 1Ω. The electric current that passes through the coil of the galvanometer in terms of the total current I is.....

a)0.02 I b)0.05I c)0.5I d)0.2I



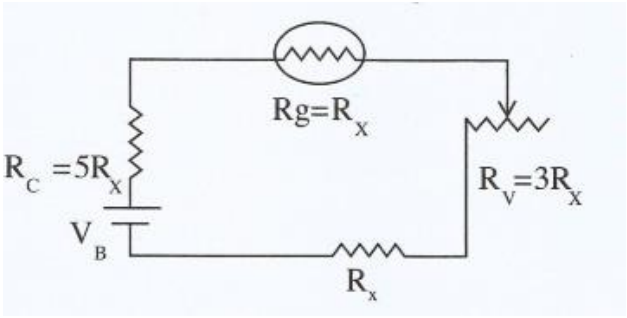
8. In the opposite figure when connect anther resistance series with unknown resistance Rx ,so the pointer deflect to 3/5 from its scale ,so the value of this resistance is .....

a) 6Rx

b) 5Rx

c) 2/3 Rx

d) 3Rx



9. A coil passes through it electric current (I) is placed on magnetic field its density (B) the plane of coil makes angle 60 with the field if you know that the magnetic dipole moment =4 magnetic torque ,so the value of (B) is .....

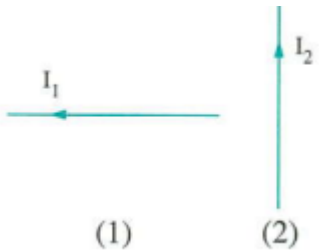
a) 3.46T

b) 2T

c) 8T

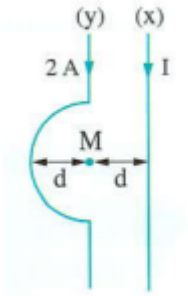
d) 0.5T

10. In the opposite figure, two straight wires (I) and (2) are in one plane, perpendicular to each other, while two electric current I_1 and I_2, are set up through them respectively, so the direction of the magnetic force that affects wire (1) due to the effect ofthe magnetic field arising from the current in wire (2) is ……



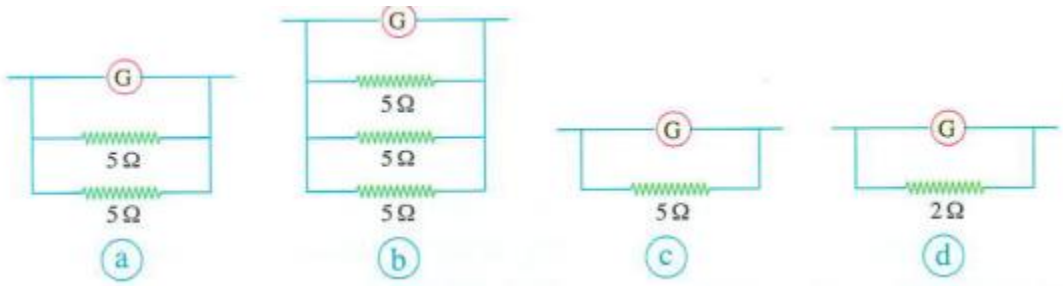
a) Up the page
b) Down the page
c) Into the page
d) Out of the page

11. The figure illustrates two current-carrying conductors (x) and (y). A current of intensity I passes through conductor (x) while a current of intensity (2 A) passes through conductor (y). Then, the current (I) that causes the magnetic flux density at point M to be zero is

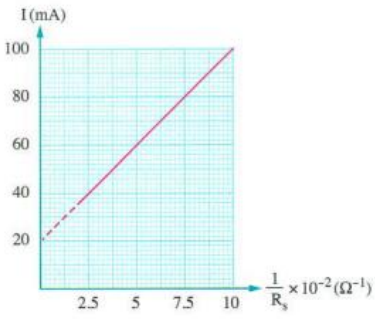


a) $\frac{\pi}{2}$
b) $\frac{\pi}{4}$
c) 2π
d) π

12. A sensitive galvanometer of resistance 15Ω was connected to different shunts to convert it into an ammeter of different range in each time. Which of the following figures represents the ammeter that has the maximum range scale?



13. The graph represents the relation between the maximum current intensity measured by an ammeter and the reciprocal of its shunt resistor, so the maximum potential difference between the shunt terminals equals…….

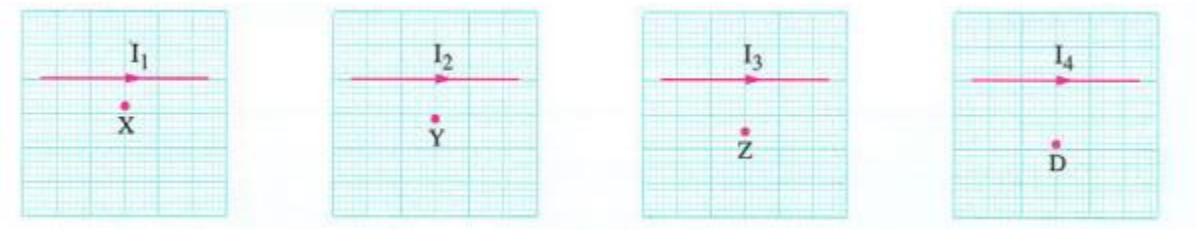


e) 0.1V
f) 0.8V
g) 1.2V
h) 1V

14. A straight wire was wound to form a circular coil of N tums, through which a current of intensity I was flowing to form a magnetic flux of density B at center of the coil. If the same wire was rewound so that the number of tums became $\frac{2N}{3}$ and the same curent intensity I got flowing through it. the magnetic flux density at its center would become.....

a) $\frac{2}{3}B$
b) $\frac{1}{9}B$
c) $\frac{4}{9}B$
d) $\frac{2}{3}B$

15. The following figures show four straight wires that are carrying different currents $(I_1, I_2 and\ I_3)$



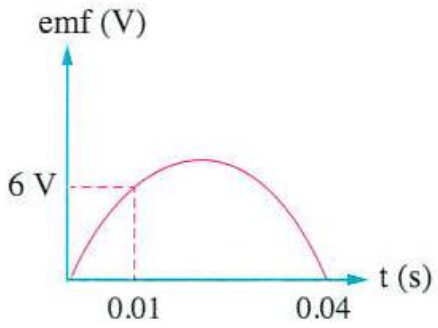
If the magnetic flux densities at the points (X, Y, Z and D) are equal, the greatest electric current intensity is ..... .

a) I_1 b)I_2 c)I_3 d)I_4

16. A coil of AC generator consists of 12 tums, each of face area A = 0.08 m^2. The total resistance of the coil's wire is 22 Ω and the coil rotates in 0.6 T magnetic field to produce an AC of frequency 50 Hz, then the maximum induced content from the dynamo when its output terminals arc connected to a negligible resistance conductor equal.....

a) 8.23A
b) 11.8A
c) 18.5A
d) 23.4A

17..The graph illustrates the relation between the induced electromotive force (emf) of dynamo coil and the time (t), the effective value of induced electromotive force is……..



a) 6V
b) $6\sqrt{2}V$
c) $12V$
d) $12\sqrt{2}$

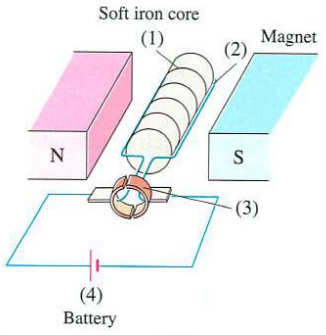
18.A magnetic flux whose density is changing by a constant rate is acting normally to a circular coil so that an induced electromotive force (E) is produced in the coil. If the number of tums of the coil gets increased to its double and its area gets decreased to its half the rate of change of the magnetic flux density remains the same, the induced electromotive force in the coil will be……

a) E
b) 4E
c) 0.5E
d) 0.25E

19.The ratio between the number of tums of an ideal step-up transformer is 3/2. if its secondary coil is connected to a device that works on a potential difference of 300 V, which of the following choices expresses the correct values of Vp and P_{ws}/P_{wp}.

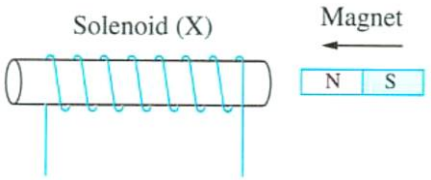
	V_P	$\frac{(P_w)_s}{(P_w)_p}$
a	200 V	$\frac{2}{3}$
b	450 V	$\frac{3}{2}$
c	200 V	$\frac{1}{1}$
d	450 V	$\frac{1}{1}$

20. The opposite figure illustrates the structure of a simple eclectic motor. To minimize the eddy currents in the soft iron core, we must



a) replace part number (3) with two metallic rings.
b) replace part number (4) with a battery of large emf.
c) replace part number (1) with an iron core that is formed of thin insulated sheets.
d) replace part number (2) with a number of coils that have small angles between them.

21. A student conducts Faraday's experiment to generate an induced electromotive force in a coil. He conducts the following steps to increase the average induced electromotive force in the coil (X):



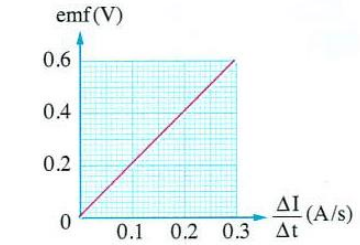
(I) replacing the coil (X) by another greater in cross-sectional area.
(II) replacing the coil (X) by another higher in number of tums.
(III) increasing the time of magnet motion.
Which of the above steps leads to achieve the purpose of the student?

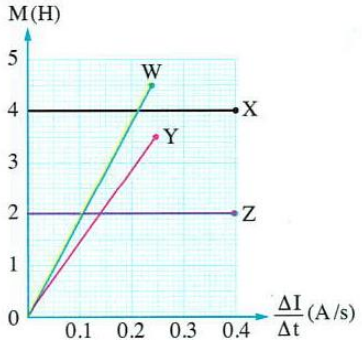
a. and (III)
b. (I) and (II)
c. (II) and (III)
d. (I), (II) and (III)

22. In a simple electric generator, its coil starts rotation from the vertical position, if the instantaneous electromotive force induced in the coil reaches half of the maximum value of the induced emf for the second time after 1/60 s from the beginning of the coil rotation, so the frequency of the produced current equals ……

a) 5Hz
b) 50Hz
c) 25Hz
d) 15Hz

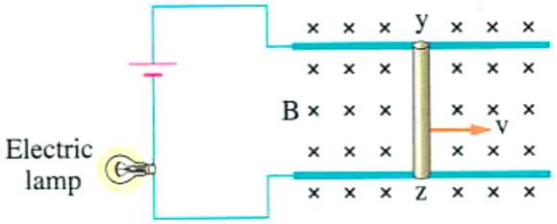
23. The graph represents the relation between the induced electromotive force (emf) in the secondary coil and the rate of change of the electric current intensity in the adjacent primary coil Which of the following graphical lines (W, X, I, Z) represents the relation between mutual inductance between those two coils (M) and the rate of current change in the primary coil.





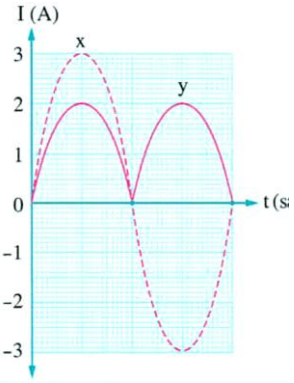
a) W
b) X
c) Y
d) Z

24. At moving the straight metallic wire (zy) toward right normal to the direction of a magnetic field (B) that is directed perpendicular into the page as shown in the figure, where the induced emf in the wire is less than the induced emf of the battery, which of the following choices correctly talks about.

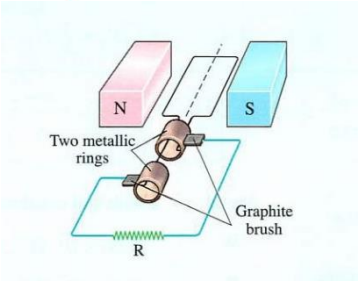


	The illumination of the electric bulb	The relation between the electric potential of points z and y
a	increases	the potential of point z is more than that of point y
b	increases	the potential of point z is less than that of point y
c	decreases	the potential of point z is less than that of point y
d	decreases	the potential of point z is more than that of point y

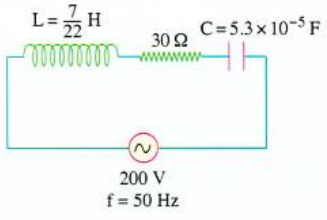
25. A student drew the sine-curve of the produced current from the shown dynamo (its coil has resistance of 10 ohms) by two different curves (x) and (y). From the curve that correctly represents the produced current, the average induced emf of that was produced within half cycle starting the rotation from the perpendicular position equals…….



a) 12.74V
b) 19.11V
c) 4.78V
d) 3.18V

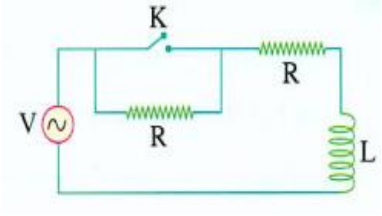


26. The opposite figure shows an RLC circuit connected with an AC source of emf rated at 200 V and 50 Hz. Using the data on the figure, so the total impedance of the circuit approximately equals……



a) 40Ω b) 50Ω c) 100Ω d) 30Ω

27. The figure illustrates an alternating current circuit, so on closing the key (K), the phase angle between the total volage (V) and the current (I)……..

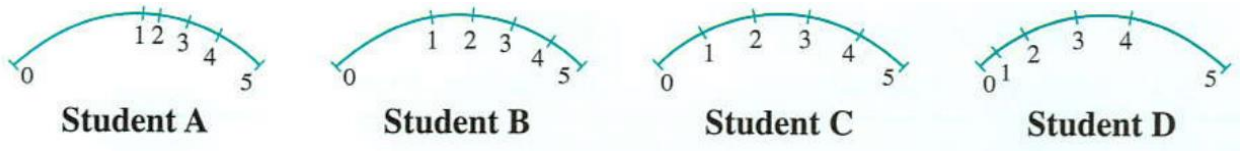


a) increases b) decreases

c) doesn't change d) becomes zero

28. Four students drew schematic diagrams for the hot wire ammeter scale, which student drawing is the correct scale for the hot wile ammeter?

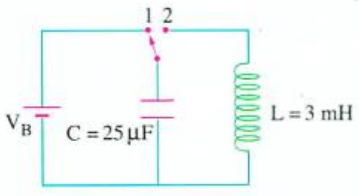
a) Student A b) Student B c) Student C d) Student D



29. Several identical inductors of negligible ohmic resistance were connected together in series to an AC supply of frequency $\frac{50}{\pi}$ Hz, their total inductive reactance became 40Ω, but when they are connected together in parallel to the same AC source, the total inductive reactance becomes 2.5 Ω, neglecting the mutual induction between the coils, so the self-inductance for each coil =……

A) 0.1 H b) 0.2 H c) 0.3 H d) 0.4 H

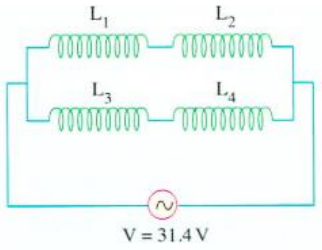
30. The figure shows an oscillating circuit containing capacitor of capacitance C and inductive coil of inductance L, then the value of the frequency for the alternating current in the oscillating circuit when the key is switched from position (1) to position (2) equals…….. $(\pi = 3.14)$



a) 0.58 Hz b) 0.0183 Hz

c) 58.14 Hz d) 581.4 Hz

31. Four inductive coils of negligible ohmic resistance each of them has a self-inductance of 50 mH were connected together as in figure. If the effective value of the passing current in the circuit is 10 A, so the frequency of this current……..

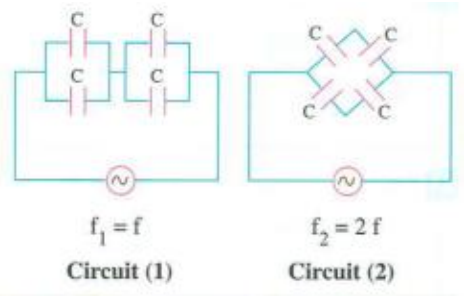


(Neglecting the mutual induction between the coils)

a) 20 Hz b) 50 Hz c) 10 Hz d) 60 H

32. In the two electric circuits, if the capacitance of each capacitor is C, so the ratio: $\frac{\text{the capacitive reactance in circuit (2)}}{\text{the capacitive reactance in circuit (1)}}$

a) $\frac{2}{1}$ b) $\frac{1}{4}$ c) $\frac{4}{1}$ d) $\frac{1}{4}$

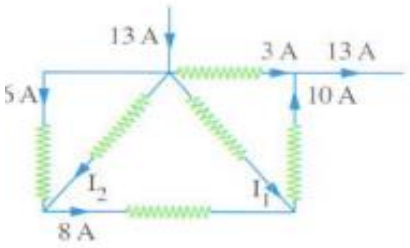


→ questions from 33:46 (2 marks):

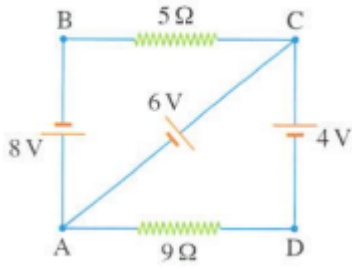
33. The opposite circuit represent a section of a closed circuit , then the values of I_1, I_2 respectively are ……..

$a) 2A, 3A$ b) $2A, 2A$

c) $4A, 2A$ d) $1A, 2A$



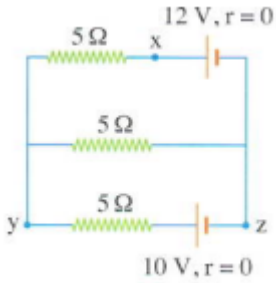
34. In the electric circuit shown in the figure , if the electric cells have negligible internal resistances . the electric current intensity that passes through the 5 ohm resistor is .....



a)0.2A b)0.8A

c)2.8A d)3.2A

35. In the opposite circuit diagram , which of the following relations is correct ?



a) $V_{xy} > V_{xz}$

b) $V_{xy} = V_{xz}$

c) $V_{xy} < V_{xz}$

d) $V_{xy} = V_B$

36. A galvanometer that has a coil of 50 Ω resistance was connected to a multiplier of 450 Ω, hence its maximum reading was I V and then it was connected io another multiplier (R_{m2}), its maximum reading became 18 V, the value of R_{m2} = ...Ω

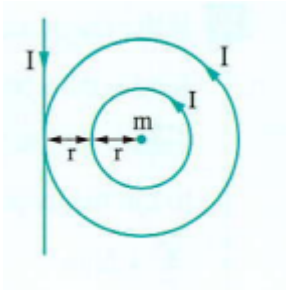
a) 9050

b) 9500

c) 9000

d)8950

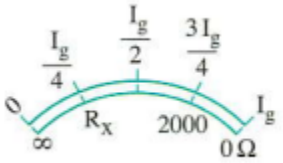
37. A current-carrying straight wire is put tangent to the outer ring of two concentric rings that carry electric currents in the same direction. If all of them are in the same plane and carry currents that have intensity I as shown in the figure, the resulting magnetic flux density at the common center (m) due to the three currents equals.....



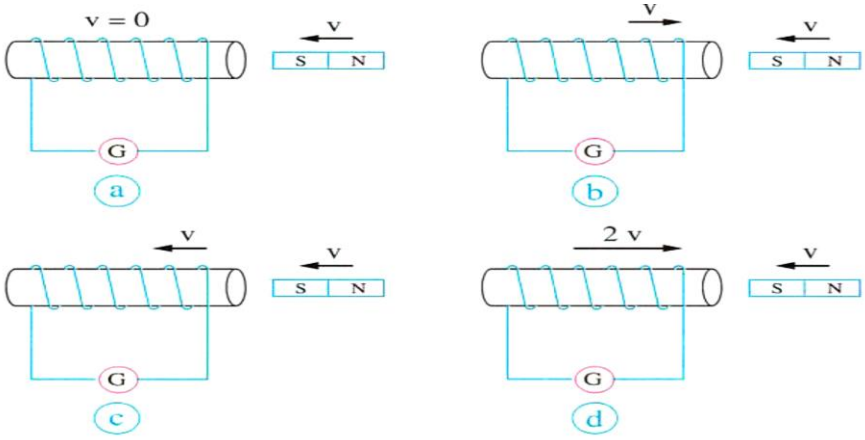
a) $\frac{0.8\mu I}{r}$ b) $\frac{0.67\mu I}{r}$ c) $\frac{0.54\mu I}{r}$ d) $\frac{0.42\mu I}{r}$

38. The opposite figure represents the scale of the galvanometer in the ohmmeter circuit, so the value of R_x equals .....Ω

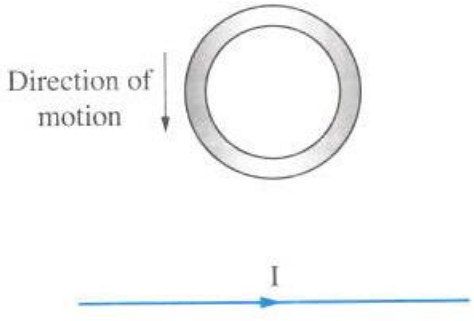
a) 6000 b) 18000 c) 12000 d) 10000



39. A magnet, a solenoid and a galvanometer are used to verify Faraday's law for electrometric induction. If the experiment repeated four times such as the magnet and the solenoid were moved with the speeds shown in the four figures. So, the pointer of the galvanometer has the greatest deflection in the experiment.....



40. In the opposite figure, a vertical long straight current-carrying wire and a metallic ring are placed in a vertical plane. Which of the following actions induces an electric current that passes in the ring in the counterclockwise direction?

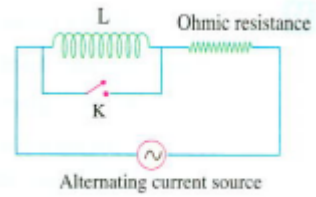


a) Moving the ring towards the wire.
b) Moving the ring away from the wire.
c) Decreasing the current intensity that passes in the wire.
d) Moving the ring in a direction parallel to the wire.

41. If the maximum generated electromotive force in the coil of a dynamo is 200 V, then the average induced electromotive force within $\frac{1}{10}$ cycle from the moment in which the plane of the coil was parallel to the direction of the magnetic flux equals……

a) 142 V
b) 169 V
c) 154 V
d) 187 V

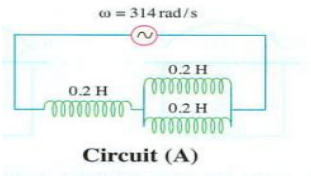
42. An AC circuit contains a non-inductive ohmic resistance and a coil of self inductance (L) of negligible ohmic resistance so that the phase angle between the voltage and the current is (θ). When the key (K) is closed, so the phase angle.....

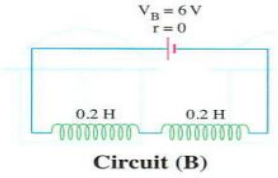


a) becomes zero
b) doesn't change
c) increases
d) decreases but doesn't equal zero

43. A) and (B) are two different electric circuits as shown:

The inductive reactance for circuit A= …….While that for circuit B=……..



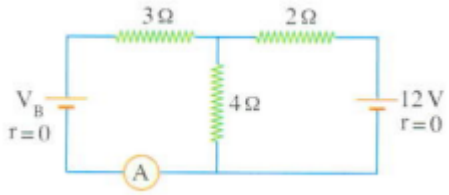


a) 94.2Ω, zero Ω
b) 94.2Ω, 125.6Ω
c) 62.8Ω, zero Ω
d) 62.8Ω, 125.6Ω

44. Resonant circuit of frequency 2 x 10^{14} Hz has a capacitor of capacitance (C) farad and a coil of self-induction (L) Henry, if the capacitance is increased to (9 C) farad and self-inductance of the coil decreases to ($\frac{L}{9}$) Henry, then the resonance frequency will……

a) increase three times
b) remain constant
c) increase 9 times
d) decrease to third

45. In the opposite figure , the value of V_B that makes the ammeter reading equal zero is .....



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46. The pointer of a milli-ammeter deflects to the end of its scale when a current of 100 mA passes through it although its reading becomes 20 mA when the potential difference between its terminals becomes 0.04 V, so to make the device be suitable for measuring a current up to a maximum intensity of 4 A, its coil has to be connected in parallel with a resistance of

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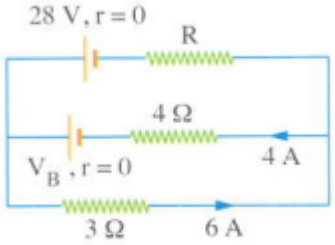
EXAM(6)

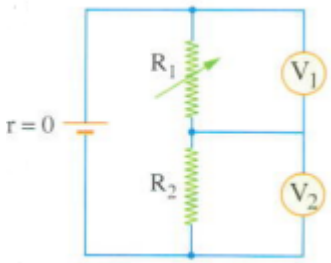
1. *In* the opposite figure , the value of R is ……..

   a)2 ohm
   b)5 ohm
   c)7 ohm
   d)8 ohm



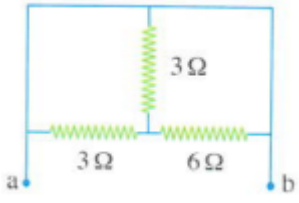
2. In the opposite electric circuit , show what happen to the readings of the two voltmeters V_1 *and* V_2 when the variable resistance $R_1 increase$?

   a)increase , increase
   b)decrease , decrease
   c)increase , decrease
   d)decrease , increase

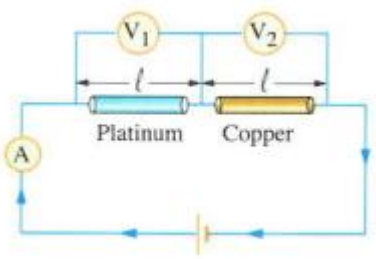


3. The opposite figure represents a part of an electric circuit , then the equivalent resistance between the two points a and b equals ……

   a)zero
   b)1 ohm
   c)2 ohm
   d)5 ohm

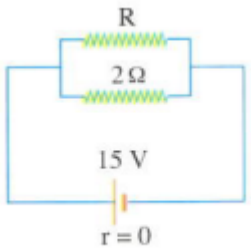


4. In the opposite figure , two conductors are connected to a circuit , the first is made of platinum and the second is made of copper while both have the same length and the cross-sectional area , if the resistivity of copper is less than that of platinum , then at const temperature …….



a)$V_1 > V_2$ b)$V_1 < V_2$ c)$V_1 = V_2 = 0$ d)$V_1 = V_2 \neq 0$

5. In the opposite electric circuit , if the consumed power from the battery equals 150 W , the resistance R equals …….



a)2Ω
b)3Ω
c)5Ω
d)6Ω

6. If the resistance of a conductor that has a cross-sectional area of 0.015 m^2 equals 10 ohm , so this means that ……

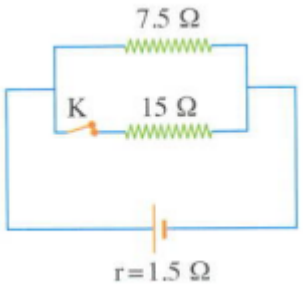
a) when the potential difference between the terminals of the conductor is 10V ,a current 100A passes through it .

b) when the potential difference between the terminals of the conductor is 10V , a current of intensity 1 A passes through it

c) the product of the length of the conductor and it's resistivity equals 0.015Ω. m^2

d) the product of the length of conductor and it's resistivity equals 1.5Ω. m^2

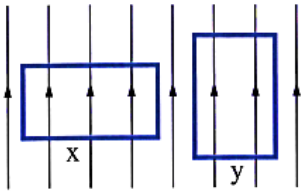
7. In the opposite electric circuit , if the current intensity that passes in the circuit in the case of closing the switch (K) , is greater than the current intensity that passes in the case of opening the switch (K) by 0.5A , so the emf of the battery equals …….

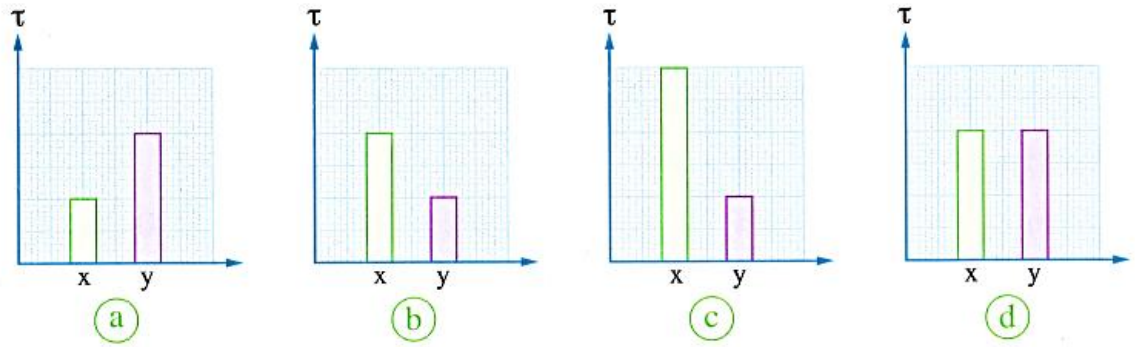


a)8.2V b)9.4V

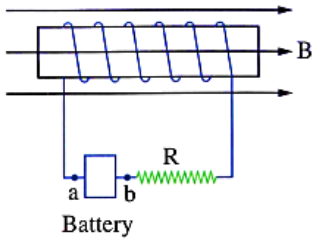
c)10.3V d)11.7V

8. The opposite figure shows two identical coils x and y, each of dimensions ℓ and 2ℓ . The two coils are placed in a uniform magnetic field, which of the following graphs represents the ratios of torques which affect each of the coils, if both of them carry the same electric current intensity?.....





9. In the opposite figure, a solenoid of length 1.1m whose number of turns is 210 turns, is placed in an external magnetic field of flux density 1.2 × 10-3 T that is parallel to the coil's axis, so the electric current that passes through the circuit and the poles of the battery, that make the resultant magnetic flux density at the center of the solenoid's axis becomes zero, are…….

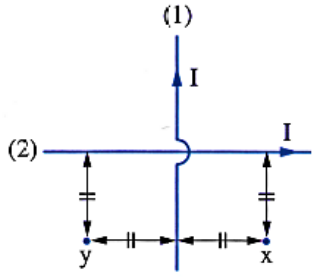


(Where : $\mu = 4\pi \times 10^{-7}$ Wb / A.m)

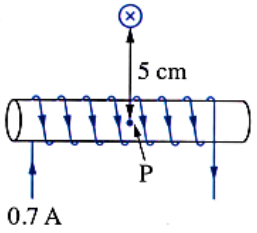
	The electric current that passes through the circuit	The poles of the battery
(a)	8 A	a is +ve pole , b is -ve pole
(b)	8 A	a is -ve pole , b is +ve pole
(c)	5 A	a is +ve pole , b is -ve pole
(d)	5 A	a is -ve pole , b is +ve pole

10. The opposite figure represents two very long insulated wires that are placed in the plane of the page. Each of the two wires carries the same current intensity. If the generated magnetic flux density due to the current in any of them at any of the two points x or y is equal to B, then the resultant magnetic flux density at…….

	Point x	Point y
(a)	2 B	0
(b)	2 B	2B
(c)	0	0
(d)	0	2B



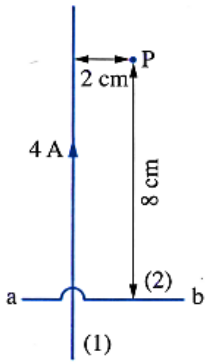
11. In the opposite figure, a solenoid that was coiled to have 100 tums/meter carries an electric current. At a distance of 5 cm from the middle of its axis, a straight wire that carries an electric current of 20 A is placed to be perpendicular to the solenoid axis. So, the resultant magnetic flux density at the middle of the axis of the solenoid (point P) approximately equals.....



(Where : $\mu = 4\mu \times 10\text{-}7$ Wb/A.m)

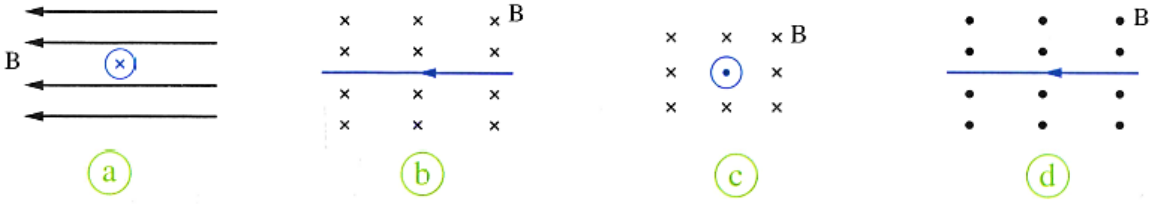
a)8 × 10-5 T b) 2.4×10-5T c)1.2×10-4T d)8×10-6T

12. In the opposite figure, two very long straight and isolated wires are perpendicular to each other. Wire (1) carries a current of intensity 4 A, so the intensity and the direction of the current that has to be passing in wire (2) so that the resultant magnetic flux density at point P vanishes are.....

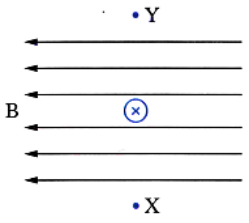


	Current intensity in the wire (2)	Current direction in wire (2)
(a)	8 A	from a to b
(b)	8 A	from b to a
(c)	16 A	from a to b
(d)	16 A	from b to a

13. In which of the following cases the magnetic force that affects the wire vanishes?.....

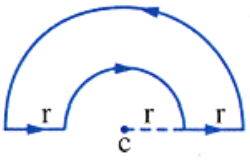


14. In the opposite figure, a long straight wire carries an electric current of intensity 25 A that is perpendicular into the plane of the page. The wire is placed in a uniform magnetic field of flux density 3x10-3 T which is in a direction parallel to the plane of the page as shown in the figure, then…….



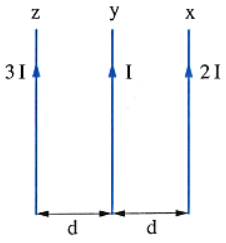
	The value of the magnetic force acting on a unit length of the wire	The direction of the magnetic force acting on a unit length of the wire
(a)	0.075 N/m	in the direction to point X
(b)	0.075 N/m	in the direction to point Y
(c)	0.15 N/m	in the direction to point X
(d)	0.15 N/m	in the direction to point Y

15. In the opposite figure, if an electric current of intensity 1 A passes through the loop, then the resultant of the magnetic flux density which is produced at the point c is…….



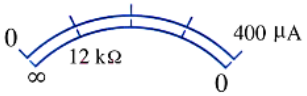
a) $\frac{\mu}{5r}$ b) $\frac{\mu}{2r}$ c) $\frac{\mu}{4r}$ d) $\frac{\mu}{8r}$

16. In the opposite figure, the ratio between the magnetic force affecting one meter of wire x to that affecting one meter of wire z ($\frac{F_X}{F_Z}$) equals…….



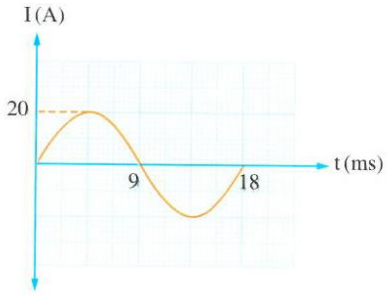
a) $\frac{1}{5}$ b) $\frac{5}{6}$ c) $\frac{7}{15}$ d) $\frac{1}{9}$

17. The opposite figure shows an ohmmeter scale of equal divisions. Using the given data on the drawing, the ohmmeter resistor is…



a) 3000 Ω b) 4000 Ω c) 6000 Ω d) 8000 Ω

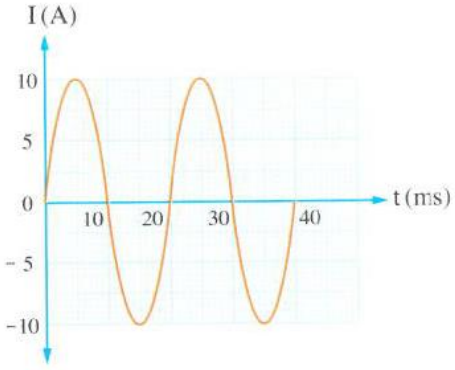
18. The opposite graph shows the relation between the induced electromotive force in the coil of a simple dynamo and the angle of rotation of the coil through half a cycle starting from the zero position, so the instantaneous electromotive force after the dynamo has been rotated by an angle of 180° from the zero position is approximately equal to…….



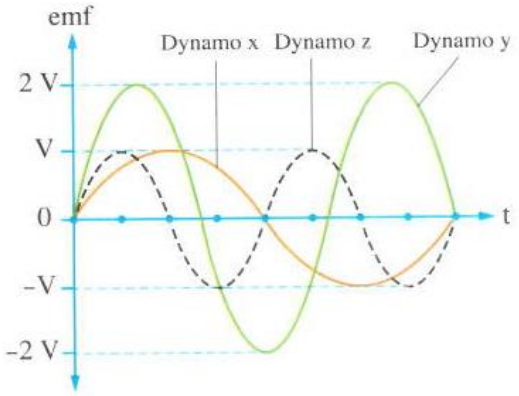
a) zero
b) 110 V
c) 156 V
d) 311 V

19. The opposite graph represents the change in the generated electric current from an AC dynamo versus time, then

	The angular speed	The effective value of current
(a)	280.4 rad/s	10 A
(b)	280.4 rad/s	$5\sqrt{2}$ A
(c)	314.29 rad/s	10 A
(d)	314.29 rad/s	$5\sqrt{2}$ A



20. The opposite graph represents the generated electromotive forces from three dynamos (x, y and z) during the same time interval. If the three coils have the same cross-sectional area and are exposed to the same uniform magnetic field, then the order of the coils according to their numbers of turns is



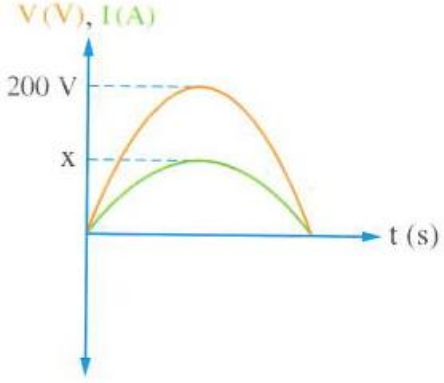
(a) $N_z > N_y > N_x$

(b) $N_x > N_y > N_z$

(c) $N_y > N_x = N_z$

(d) $N_y > N_x > N_z$

21. The opposite graph represents relation between both of the voltage (V) and the current (I) which are produced from an AC dynamo within half cycle versus time (t). If the produced power from the dynamo is 175 W, then the value of current x on the graph equals



a)2.5A b) 1A c) 1.75A d) 0.25A

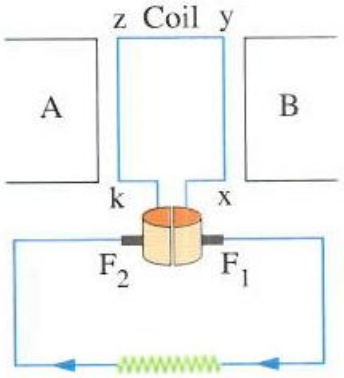
22. If the frequency of the generated current from an AC dynamo is 50 Hz, so the frequency of the current of that dynamo after being rectified into a unidirectional current will be

a) 25 Hz
b) 50 Hz
c) 100 Hz
(d) 200 Hz

23. When a metallic commutator is used instead of the two slip rings of the AC dynamo, then

	The generated current in the dynamo's coil	The current passing in the external circuit
(a)	AC current	AC current
(b)	unidirectional current	unidirectional current
(c)	AC current	unidirectional current
(d)	unidirectional current	AC current

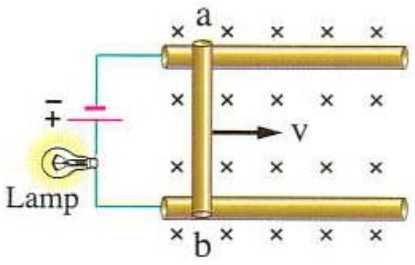
24. The opposite figure represents the structure of a unidirectional current dynamo, then which of the following choices represents the types of the magnetic poles A, B and the direction of motion of the side xy at that moment?



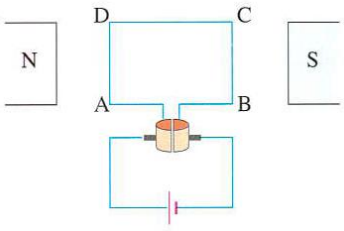
	A	B	Direction of motion of the side xy
(a)	N	S	Out of the page
(b)	N	S	Into of the page
(c)	S	N	Into of the page
(d)	S	N	Towards pole B

25. In the opposite figure, during the motion of the rod (ab) to the right as shown, the brightness of the lamp.....

a) Increases
b) Decrease
c) Remains the same
d) Vanishes

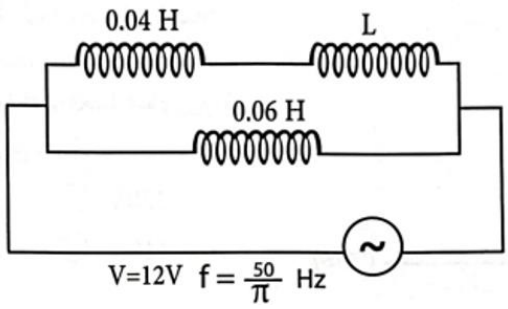


26.The figure illustrates the structure of a simple electric motor. When the coil rotates from the parallel position, the force acting on wire AD.



a) remains maximum
b)remains zero
c) increases from zero to the maximum value.
d)decreases from the maximum value to zero.

27.Three inductors with non ohmic resistance connected with alternating source, so the self-induction coefficient (L) when electric current (3A) passes through a circuit is .....

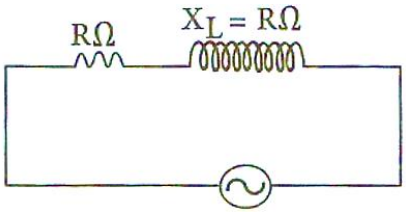


a) 0.08mH b) 80mH
c) 40mH d) 120mH

28.A receiving circuit contains ringing circuit composed of coil its self-inductance 1H and capacitor its capacitance 3.5μF ,so the resonance frequency equals.....

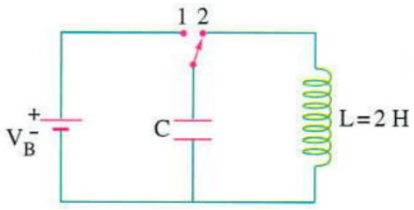
a) 45.495KHz b) 85.11Hz c) 0.085Hz d) 13.55Hz

29.In the opposite figure an induction coil (with non ohmic resistance) when coil cut $\frac{1}{4}$ from its length then coil connected again with circuit, so which of the following choices is correct?



a) Phase angle will decrease by 8.13°
b) Phase angle will decrease by 36.87°
c) Phase angle will decrease by 30.96°
d) Phase angle will decrease by 14.04°

30. The shown oscillatory circuit contains an inductor of inductance (L = 2 H) , so the capacitance of capacitor (C) that is required to obtain a current of frequency 80 Hz equals .... (Take: π=3.14)



a) 1.98 μF

b) 1.98×10^{-6} μF

c) 1.58×10^{-4} μF

d) 1.58 μF

31. What change should be done to the self-inductance of the coil in an oscillating circuit to double the frequency of the current?

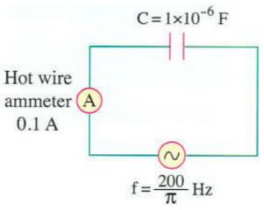
a) Increase it to its double.

b) Increase it to its quadruple

c) Decrease it to its quarter.

d) Decrease it to its half.

32. The opposite figure represents an electric circuit that contains a hot wire ammeter of negligible ohmic resistance, a capacitor and an AC source, so the effective value of emf of the source equals .....



a) 250 V

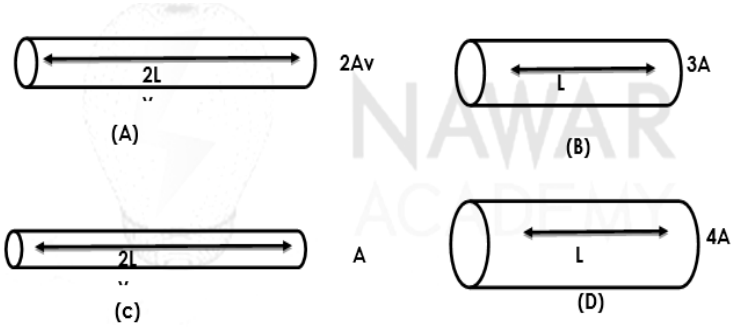
b) 2.5 V

c) 25 V

d) 2500 V

→ questions from 33:46 (2 marks):

33. The figure shows four uniform conductors made of the same material, but of different dimensions. Their correct arrangement ascendingly according to their electrical resistance, starting from the least to the greatest resistance is .....



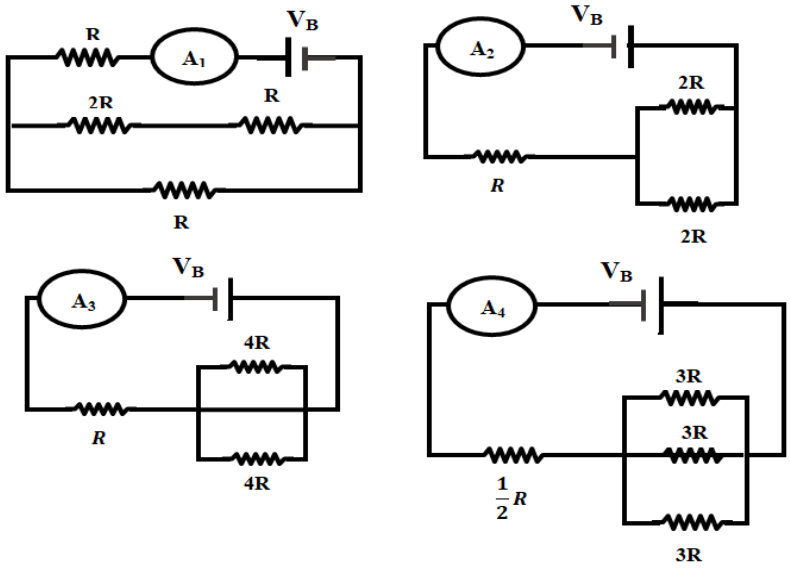
A) C → A → B → D

B) D → B → A → C

C) B → C → A → D

D) D → A → C → B

34. Each of the four electric circuits contains an ammeter. What is the correct arrangement of the reading A_1, A_2, A_3, A_4 of the four ammeter ?



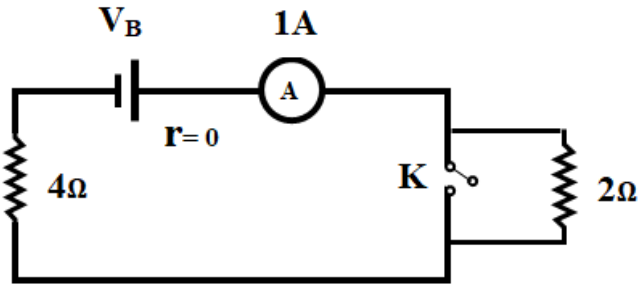
A) $A_3 > A_1 > A_2 > A_4$

B) $A_3 > A_4 > A_1 > A_2$

c) $A_1 > A_2 > A_4 > A_3$

D) $A_2 > A_1 > A_3 > A_4$

35. In the circuit shown in the drawing, when the switch (K) is closed, the ammeter reading becomes.....



A) 0.5 B) 1.5 A

B) 2A D) 0.75A

36. An ohmmeter contains a galvanometer that shows full-scale deflection when a current I_g passes in it and when an external resistor 12 kΩ is connected to its test teminals, the passing current becomes $\frac{1}{5}I_g$, so if a resistor of 1.5 kΩ is connected to the test terminal, the passing current becomes .....

a) $\frac{2}{3}I_g$

b) $\frac{1}{8}I_g$

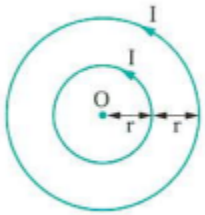
c) $\frac{1}{5}I_g$

d) $\frac{3}{4}I_g$

37. A rectangular coil, that has no. of tums = 2 turns ,length =10 cm and width = 2 cm, carries an electric current of 2 A while being placed in a uniform magnetic field of flux density 2 T, so the magnetic torque acting on the coil, when the angle between the coil and the direction of the magnetic flux = 60^0, equals .....

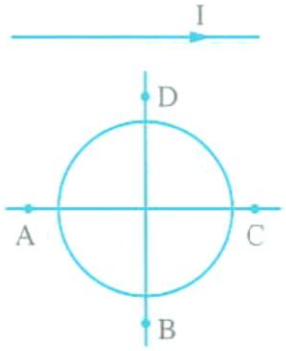
a) $8 \times 10^{-3} N.m$ b) $16 \times 10^{-3} N.m$ c) $8\sqrt{3} \times 10^{-3} N.m$ d) $16 \times 10^{-4} N.m$

38. Two concentric rings both carry electric current I at the same direction as shown in the figure, producing magnetic field of flux density B at the common center (O). If the direction of the passing current through one ring only is reversed keeping the other current as it is, so the resultant magnetic flux density at (O) becomes.....



a) $\frac{B}{2}$
b) $\frac{B}{4}$
c) $\frac{B}{3}$
d) $\frac{B}{5}$

39. A metallic ring is placed in the same plane with a straight wire that carries an electric current I as shown in the figure. If the ring is moved and consequently a current is induced through it in the clockwise direction, the direction in which the ring has been moved was towards point.....

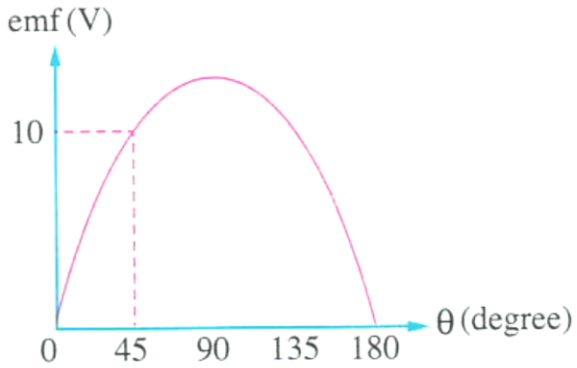


a) A
b) B
c) C
d) D

40. Two circular coils (I) and (2), have areas A_1 and A_2 respectively and have the same number of tums. If they are placed in a magnetic field that is perpendicular to their planes. Hence, when the magnetic flux density changes with the same rate through the two coils, it is noticed that the average induced electromotive force in coil (I) equals to the double of that induced in coil (2), so.....

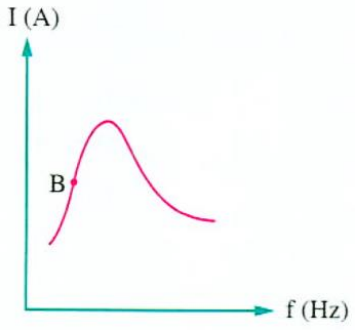
a) $A_1=4A_2$
b) $A_1=0.5A_2$
c) $A_1=2A_2$
d) $A_1=0.25A_2$

41. The opposite graph represents the change of the induced electromotive force (emf) in the dynamo's coil with respect to the angle between the normal to the coil's plane and the direction of the magnetic flux (θ), so the magnitude of the average induced emf in the dynamo's coil during 1/3 cycle from the starting of the coil's rotation equals.....



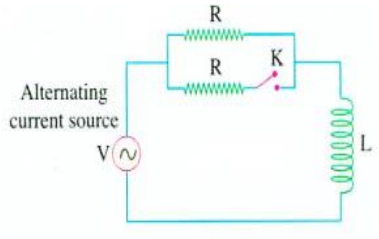
a) 3.002V
b) 6.369V
c) 9.006V
d) 10.132V

42. An alternating current circuit contains an inductive coil of negligible ohmic resistance, a capacitor of variable capacitance and an ohmic resistance which are connected in series. From the opposite graph, the ratio between the source voltage and the potential difference across the ohmic resistance at point (B) .....



a) is less than one
b) equals zero
c) equals one
d) is greater than one.

43.The figure illustrates alternating current circuit: On closing the key (K), the phase angle between total voltage (V) and the current (I) .....



a) decreases **b) doesn't change**

c) increases **d) becomes zero**

44.It was noticed that, the pointer of a hot wire ammeter moves on a non-uniform scale. This is due to……

a) the hot wire ammeter measures the maximum value of the alternating electric current

b) the pointer of the hot wire ammeter moves slowly at the beginning of passage of the electric current

c) the amount of heat energy generated is directly proportional to the intensity of the electric current

d) the amount of heat energy generated is directly proportional to the square of the intensity of the electric current

45.Ideal electric transformer its primary coil is connected with A.C supply of 120V and its secondary coil is connected with an electric lamp which works on 12V and power 60 watt . Calculate the current intensity in both of the primary and secondary coil of the transformer.

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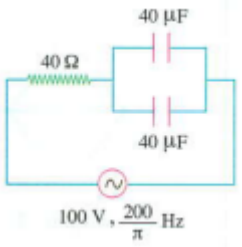
46. **In the shown electric circuit: The phase angle between the total potential difference (V_t) and the current intensity (I) equals……**



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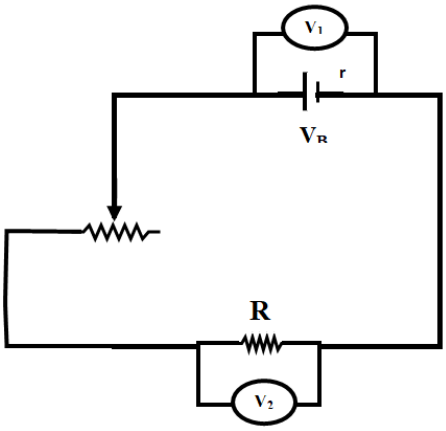
EXAM(7)

1. Two wires of the same material, if you know that the diameter of the first wire is 3 times the diameter of the second wire, and the resistance of the second wire is 4 times the resistance of the first wire; Therefore, the length of the second wire ……. the length of the first wire.

A) $\frac{4}{3}$ B) $\frac{4}{9}$

C) $\frac{72}{2}$ D) $\frac{36}{3}$

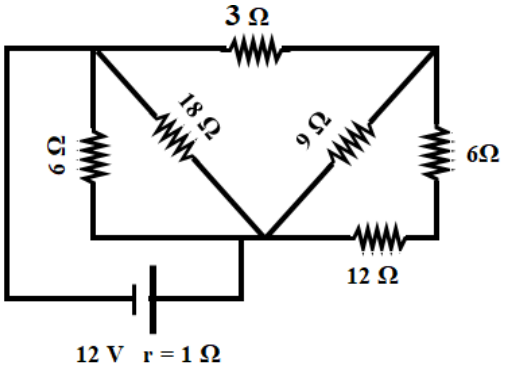
2. From the circle in front of you, the ratio between $\frac{V1}{V2}$ = …….



A) $\frac{VB+Ir}{IR}$ B) $\frac{IR}{VB+V2}$

C) $\frac{IR-Ir}{V2-VB}$ D) $\frac{VB-Ir}{IR}$

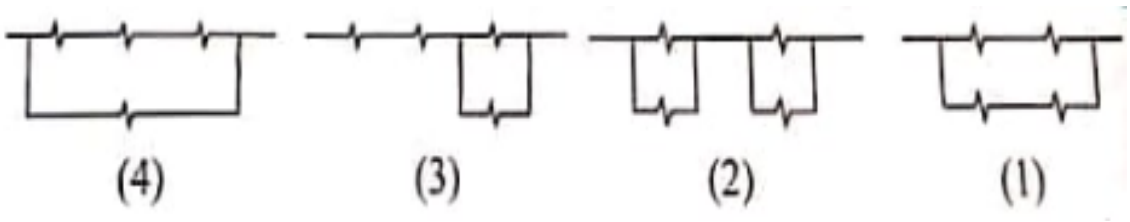
3. In the electrical circuit in front of you The intensity of the electric current of the circuit I equals…



A) 0.76 A B) 0.83A

C) 3A D) 4 A

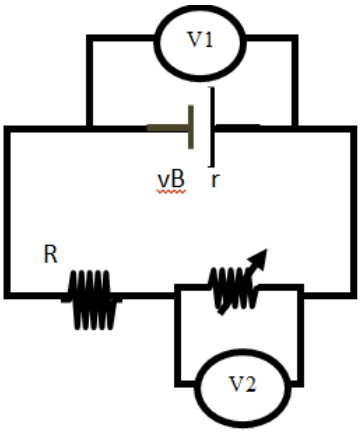
4. Four equal resistances connected together as shown in the figures:



Which of this shapes gives lower equivalent Resistance

a) 4 **b) 1** **c) 2** **D) 3**

5. In the shown circuit when the variable resistance (s) increase



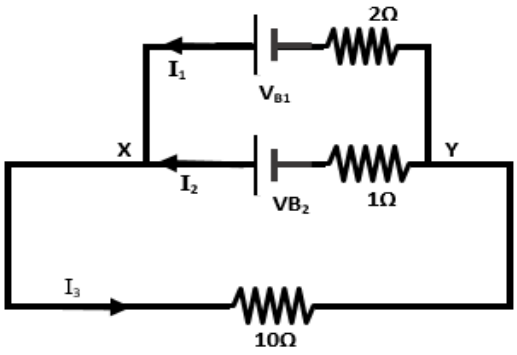
A) V_1,V_2 increase

B) V_1 increase, v_2 decrease

C) V_1 decrease, v_2 increase

D) V_1,v_2 decrease

6. In the opposite circuit if direction of I1,I2 represent the direction of electrons but I_3 represent the conventional direction by applying the equation ….



a) $-I_1-I_2+I_3=0$ **b) $I_1-I_2+I_3=0$**

c) $-I_1+I_2+I_3=0$ **d) $I_1+I_2+I_3=0$**

7. When pass a current it's intensity (I) and it's cross sectional area is (A) , when change the battery , the intensity of current will be 3I , the cross sectional area will be ……

a) A **b) 3A** **c) $\frac{1}{3}$A** **d) 6A**

8. A galvanometer, the resistance of its coil is (R_g), measures a maximum current of I, When a shunt resistance of value R_1 is connected to its coil, its sensitivity Sets reduced to $\frac{3}{4}$, of its original value. When the shunt is replaced by another of resistance R2, its sensitivity decreases to $\frac{3}{8}$ of its original, So $\frac{R_1}{R_2}$ =.....

a)2 b) 3 c) 4 d)5

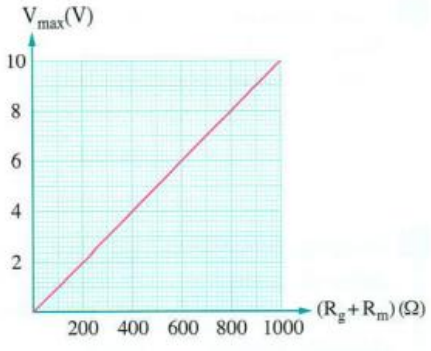
9. A circular coil of number of tums (N) and radius (r) is carrying an electric current of intensity (I), so a magnetic field of flux density (B) is generated at its center .If the coil is cut such as a quarter of its tums are removed and the same current (I) is set to pass through it. So, the magnetic flux density at the center of the coil in the second case equals. ...

a) B b) $\frac{3}{4}B$ c) $\frac{3}{2}B$ d) $\frac{4}{3}B$

10. A current-carrying coil is placed inside a magnetic field of flux density 400mT, where the coil plane makes angle θ with the direction of the magnetic flux. If the ratio of; $\frac{The\ value\ of\ magnetic\ dipole\ moment}{the\ value\ of\ magnetic\ torque} = 5T^{-1}$, then the value of angle (θ) equals.....

a) 30 b) 35 c) 60 d) 55

11. A galvanometer that can withstand maximum potential difference of 1 volt across its coil, was connected to several multipliers to convert it into voltmeter. The graph illustrates the maximum measured potential difference (V_{max}) versus the total resistance of the voltmeter ($R_g + R_m$). So. the resistance of the galvanometer's coil (R_g) equals .....

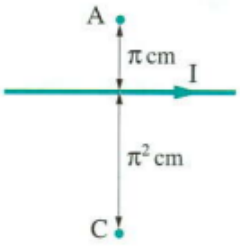


a) 100 Ω
b) 1000 Ω
c) 500 Ω
d) 50Ω

12. A galvanometer's coil has resistance R_g in which a current of (I_g) causes full scale deflection. When a shunt of value (R) is used, it measures a current up to (4I).If the shunt resistor is replaced by another of value (3R), so the maximum current that can be can be measured…….

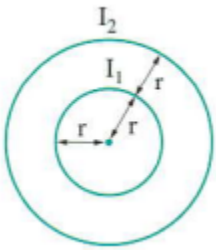
a) $1.5I_g$ b)$3I_g$ c) $2.5I_g$ d) $2I_g$

13. A straight wire is carrying a current of intensity (I) as in the figure, A, C are two points beside the wire. So, the ratio between:$\frac{B_A}{B_C}$ =……



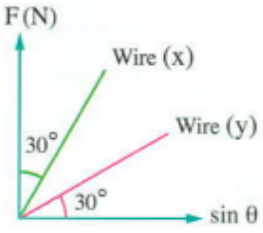
a) $\frac{1}{\pi}$ b) $\frac{1}{2\pi}$ c) 2π d) π

14. The figure illustrates two concentric circular coils of same number of tums and having different radii, each coil produces magnetic flux of density (B) at the common center due to the electric current passing through each of them (I_1, I_2) as shown. Which of the following choices correctly represents the relation between the values of (I_1 and I_2), their directions and also the magnitude of the resultant magnetic flux density (Bt) at the common center?



	The relation between the values of I_1, I_2 and their directions	B_t
a	$I_1 = I_2$ in the same direction	2 B
b	$I_2 = 2\ I_1$ in the opposite direction	zero
c	$I_2 = I_1$ in the opposite direction	zero
d	$I_2 = \frac{1}{2}\ I_1$ in the same direction	2 B

15. The graph represents the relation between the magnetic force (F) acting on two straight wires (x, y) and sine the angle between each wire and the direction of the magnetic field of flux density (B) in which the wires are placed (sin θ) If the ratio between: $\frac{I_x}{I_y} = \frac{3}{4}$ so, the ratio between $\frac{length\ of\ wire\ X}{length\ of\ wire\ Y}$ =……



a) $\frac{4}{3}$ b) $\frac{4}{9}$ c) $\frac{4}{1}$ d) $\frac{8}{3}$

16.Two parallel long wires (X) and (Y) the normal distance between them is 0.5 m , the two wires carrying currents pass in the same direction , the value of the current in wire X is (I) and that of wire Y is (3I), so that the position of the neutral point is at a distance …….

A. 0.125 m from wire Y
B. 0.25 m from wire Y
C. 0.125 m from wire X
D. 0.625 m from wire X

17.A solenoid of length 20cm consists of 100 turns and its radius is 0.1 m carries a current of 4.9 A. Knowing that the permeability of the medium inside the coil is $(\frac{88}{7} \times 10^{-7})$ wb/A.m , the magnetic flux lines that penetrate the face of the coil equals……

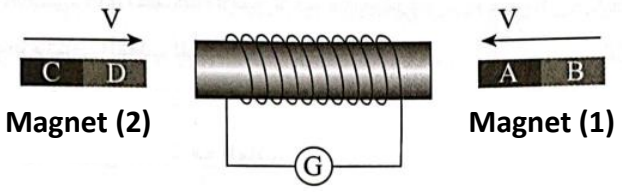
A- 6.66×10-6 Wb

B- 30.8×10-4 Wb

C- 6.66×10-3 Wb

D- 9.68×10-5 Wb

18.Two identical magnets are placed at the same distance from a solenoid as shown in the figure when two magnets move with the same velocity and in same instant we found that pointer of galvanometer not deflect because……



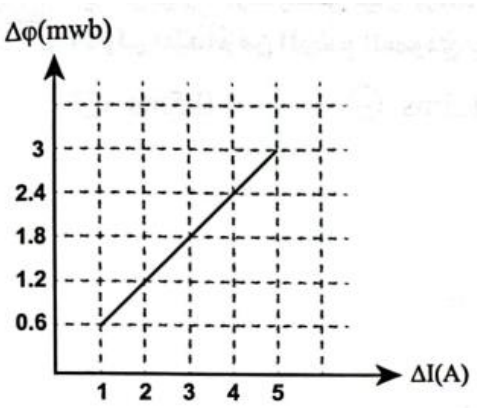
a) Pole (A) is north and pole (D) is north
b) Pole (A) is north and pole (D) is south
c) Pole (A) is south and pole (D) is north
d) Pole (B) is south and pole (D) is south

19.A motor it composed from one coil when plane of coil perpendicular in a magnetic flux lines , so which of the following quantities not equal zero?

a) Magnetic dipole moment
b) Angular velocity
c) Magnetic torque
d) Magnetic force affected on wires of coil

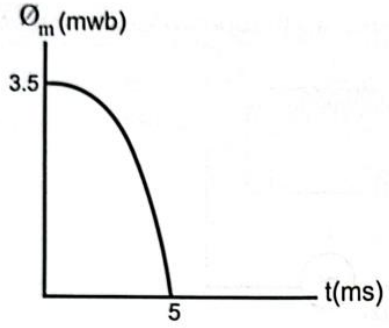
20. A dynamo its frequency is 50Hz ,so the time of reaching current to its effective value for first time which start its rotation from perpendicular position equals…..
    a) 0.5ms
    b) 1.5ms
    c) 2.5ms
    d) 0.25ms

21. Two coils (X) ,(Y) number of turns of coil (X) is 500 and number of turns of (Y) is 1000 the opposite figure represents the change of magnetic flux which affected on coil (Y) when change the current in coil (X) ,so the mutual induction coefficient equals…….



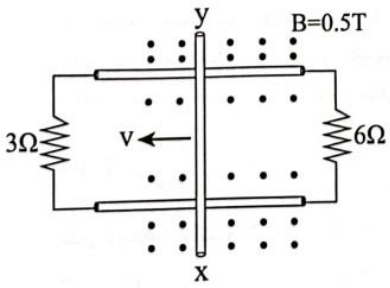
    a) 0.3H
    b) 0.6H
    c) 0.9H
    d) 1.2H

22. The opposite figure represents the change of magnetic flux ϕ_m and time (t) in a dynamo its turns is 200 , so the average induced emf through quarter cycle is …..



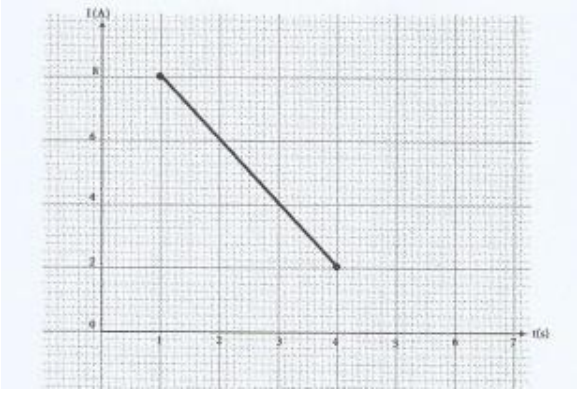
    a) 155.56V
    b) 220V
    c) 140V
    d) 110V

23. A metallic wire (yx) its length is 0.2m and its resistance 1Ω moves to left with velocity 3m/s perpendicular to a magnetic field its density is 0.5T and connected with resistors 6Ω , 3Ω as shown in the figure ,so the potential difference between reasistance 3Ω when wire moving is ……



    a) 0.2V
    b) 0.3V
    c) 0.1V
    d) 0.4V

24.Two adjacent coils its mutual induction coefficient is 2H and the opposite graph represents the relation between change of current in a primary coil and time



,so which of the following graphs represents the relation between induced emf in a secondary coil and time ?

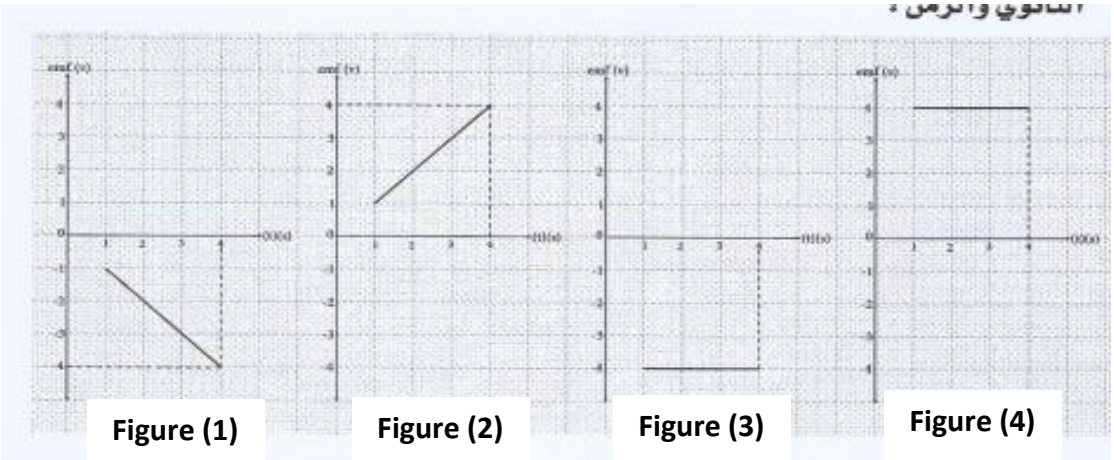
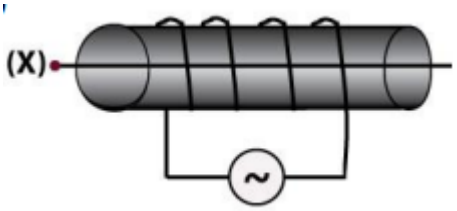
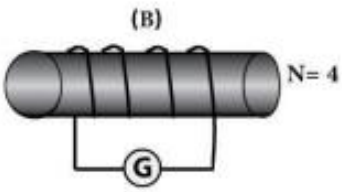


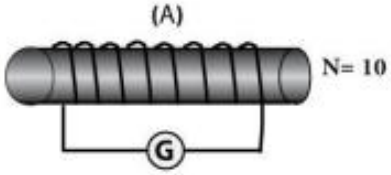
Figure (1) Figure (2) Figure (3) Figure (4)

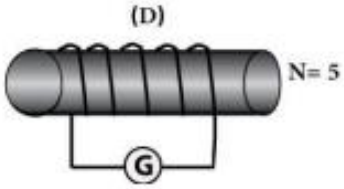
a) 1
b) 2
c) 3
d) 4

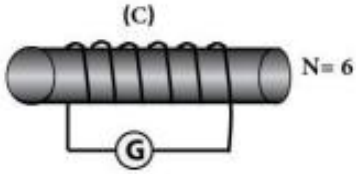
25. The figure represents a coil connected with an alternating current source . Which of the following coils when it is placed at point (X) (So that the axes of the two coils are at the same Line) the pointer of the galvanometer deflects with a higher angle? (Knowing that the permeability of all coils is the same.)



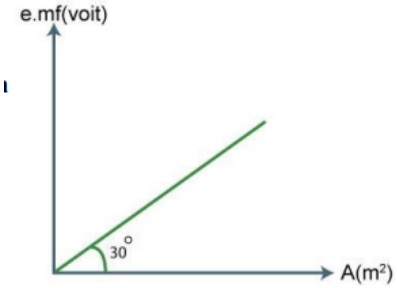






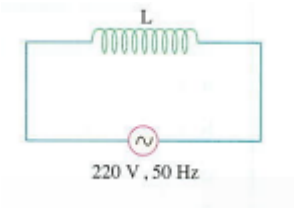


26. A group of coils of different areas , the number of turns of each coil is 100 turns, are exposed to a variable magnetic flux at the same time. The following graph represents the relation between the average induced electromotive force in each coil and the area so the rate of change in magnetic flux density is .....



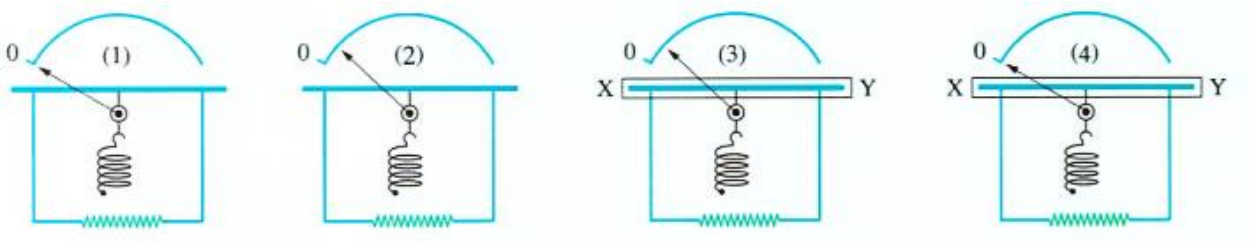
a) 0.577×10^{-3} T/s
b) 57.7×10^{-3} T/s
c) 577×10^{-3} T/s
d) 5.77×10^{-3} T/s

27. In the shown circuit, an alternating current source (220 V, 50 Hz) is connected to an inductive coil of self-inductance (L) with negligible ohmic resistance. Current of intensity 2 A passes in the coil. So, the self-inductance of the coil (L) equals.....



a) 0.7 H b) 0.35 H c) 4.4 H d) 0.04 H

28.In one of the hot climate countries, a student use the hot wire ammeter in the un-airconditioned school lab.



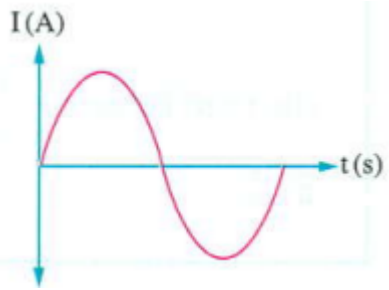
Which two figures show the correct position of the hot wire ammeter pointer at the lab's temperature? (Knowing that (XY) is a plate made of a material having the same expansion coefficient of platinum and iridium wire)

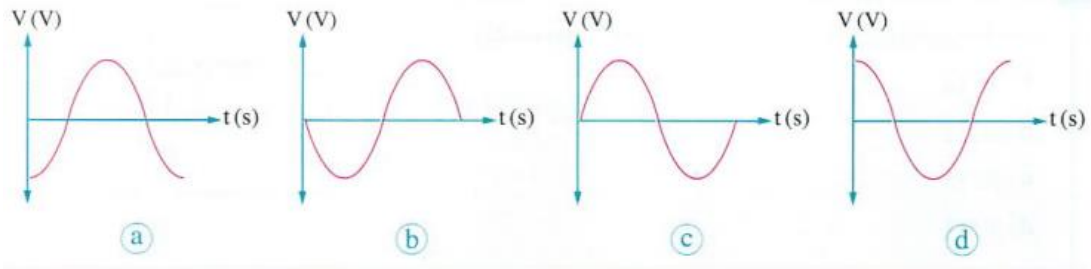
a) (2), (4) **b) (1), (3)** **c) (3), (2)** **d) (4), (1)**

29.The figure illustrates two capacitors of the same capacitance (C) connected in series. When a third capacitor of capacitance that equals half the capacitance of one of the two capacitors is connected in parallel between (A, B). So, the total capacitance of the three capacitors equals…….

a) C **b) 2C** **c) $\frac{C}{2}$** **d) $\frac{3}{2}$C**

30. The graph illustrates the relation between the change in the current intensity (I) and the time (t) in an alternating current circuit contains a capacitor. Which of the following graphs represent the change of voltage across the two plates of the capacitor at same time?





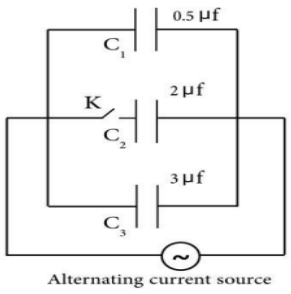
31. An electric current (I) passes through hot wire ammeter , when increasing the value of electric current to ($2I$) ,so…..

	Expansion of (platinum- iridium) wire	Thermal energy which produced in a wire through unit of time
a)	Increase	Increase to double
b)	Decrease	Decrease to half
c)	Increase	Increase to 4 times
d)	Decrease	Decrease to quarter

32. The opposite electric circuit, the ratio between the total capacitance of capacitors before closing the key (K) and after closing it equals ……

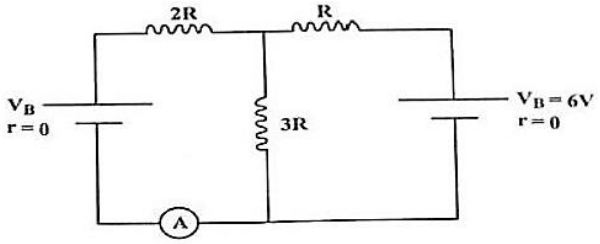
a) $\frac{7}{11}$ b) $\frac{11}{7}$

c) $\frac{6}{1}$ d) $\frac{1}{6}$



→ questions from 33:46 (2 marks):

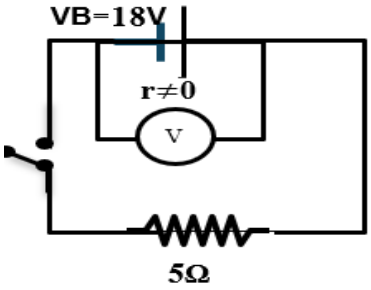
33. In the shown electric circuit, the value of (V_B) that makes the reading of the ammeter vanishes = ...



a) 6 V b) 4.5 V

c) 8 V d) 12 V

34. If the Voltmeter reads 18V when the switch (K) is opened, but reads 15V when the switch is closed, so the internal resistance of the cell = ...



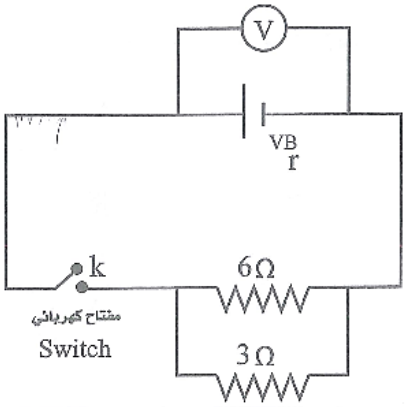
a) 3 Ω

b) 4 Ω

c) 2 Ω

d) 1 Ω

35. In the electric circuit shown, the Voltmeter reads 14 V when the switch (k) is opened, but reads 8 V when the switch (k) is closed. Then the internal resistance of the battery = ...



a) 1.25 Ω b) 0.5 Ω

c) 1.5 Ω d) 0.25 Ω

36. A rectangular coil made of insulated wire, its dimensions are 0.1m and 0.05m, consists of 50 turns, can rotate in a magnetic flux of 10-3 wb perpendicularly to the coil plane , around an axis in the same plane of its surface that is parallel to its length. If a current of 2A passes through the coil so, the value of the magnetic torque acting on the coil equal to .....

A- 0.1N .m

B- zero

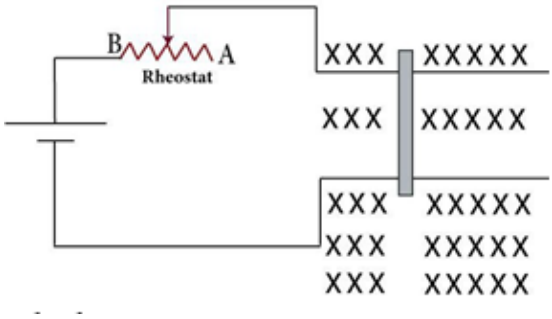
C- 5 x 10-4N .m

D- 2 x 10-3N .m

37. A voltmeter the resistance of its coil is 40 Ω, reaches its full-scale deflection when a current of intensity 0.1A passing through it. Then the value of the multiplier resistance of the device that makes the maximum potential difference reaches 100V between its two ends is ……

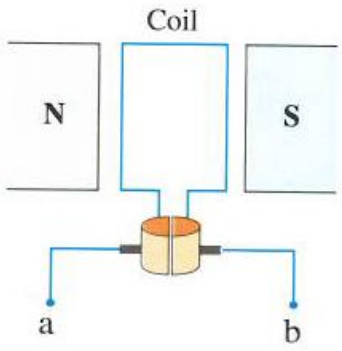
A- 25 Ω
B- 2.5 Ω
C- 960 Ω
D- 1040 Ω

38. A cylindrical metallic rod (L) ,slides on two copper sheets fixed in same plane of the page , the two sheets are connected to a battery and a rheostat where the rod and sheets are placed in a uniform magnetic field of flux lines perpendicular to the plane of the page as in figure, Which of the following represents what happens to the rod L on moving the slider of the rheostat towards point B:

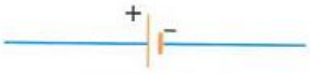


b. Force (F) decreases and rod moved away from the battery.
c. Force (F) increases and rod moved away from the battery.
d. Force (F) increases and rod moved towards the battery.
e. Force (F) decreases and rod moved towards the battery.

39.The opposite figure shows the structure of one of the electric devices. What is the part that if connected between the points a, b makes the coil rotates in one direction between the poles of the magnet?



(a)

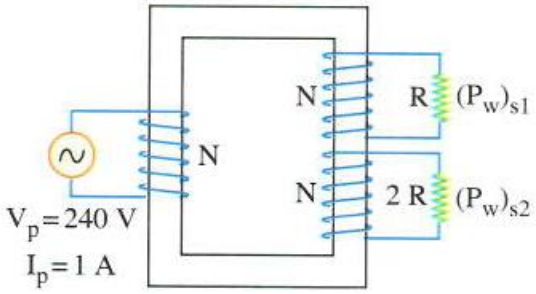


(b)

(c)

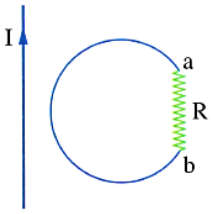
(d)

40.In the opposite figure a non-ideal transformer that has two secondary coils. What are the probable values for the electric powers in these two coils?



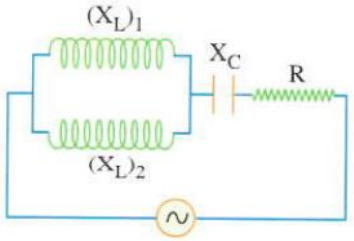
	$(P_w)_{s1}$	$(P_w)_{s2}$
(a)	120 W	120 W
(b)	100 W	100 W
(c)	160 W	80 W
(d)	120 W	60 W

41. In the opposite figure, during the increase of the intensity of the electric current through the straight wire,.....



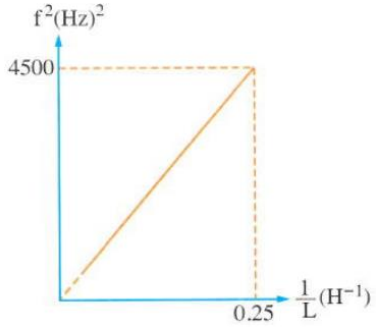
a) an induced electric current is generated in the metallic ring in the direction from a to b through resistor R
b) an induced electric current is generated in the metallic ring in the direction from b to a through resistor R
c) no induced current is generated in the metallic ring
d) the ring moves away from the wire

42. The opposite circuit becomes in a state of resonance when.....



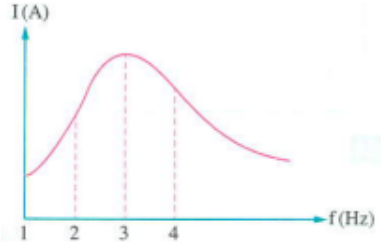
a) $X_C = (X_L)_1 + (X_L)_2$
b) $X_C = \frac{(X_L)_1}{2} + \frac{(X_L)_2}{4}$
c) $X_C = \frac{(X_L)_1 \cdot (X_L)_2}{(X_L)_1 + (X_L)_2}$
d) $X_C = (X_L)_1 = (X_L)_2$

43. A capacitor of constant capacitance is connected in series with an inductor of changeable self-inductance and an AC source of changeable frequency so that the circuit is kept always in a state of resonance and the opposite graph represents the relation between the square of the resonance frequency (f) of the circuit and the reciprocal of the inductance of the inductor (+), then the capacitance of the capacitor is



a) 0.9×10^{-6} F
b) 1.1×10^{-6} F
c) 1.4×10^{-6} F
d) 1.9×10^{-6} F

44. An alternating current circuit contains an inductive I(A) coil of negligible ohmic resistance, a capacitor of variable capacitance and an ohmic resistance connected together in series. From the shown graph, The resultant of inductive reactance and capacitive reactance vanishes at point .....



a) 1
b) 2
c) 3
d) 4

45.A solenoid made of insulated copper wire carrying an electric current (I), and the magnetic flux density along its axis is (B) , If the turns are displaced uniformly away from each other, So the magnetic flux density along its axis is decreased to $\frac{B}{4}$ If we have to increase the current intensity by 3A to return the value of magnetic flux density to its initial value (B) , then the current intensity (I) is ……

……
……
……
……
……
……
……
……

46.An electric magnet the resistance of its coil is 2Ω and its self inductance coefficient is 2H is connected to switch and battery in closed electric circuit and when open the circuit electric current vanished in 0.1 second ,so the induced emf will produced between terminals of a coil its value is 150V.

Calculate : 1) the electric current intensity which passes through coil before opening the circuit

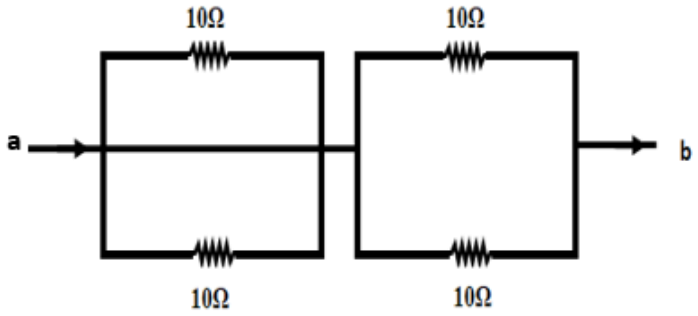
2) potential difference between terminals of a coil before opening the circuit

……
……
……
……
……
……
……
……

EXAM(8)

1. In the electric circuit shown, the equivalent resistance between points

(a, b) equals ….



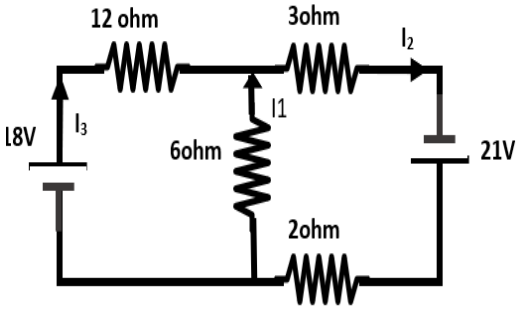
A) 5 Ω

B)10 Ω

C) 20 Ω

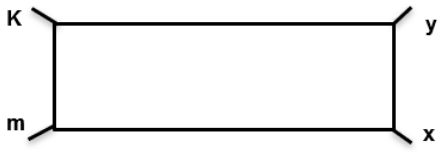
D) 40 Ω

2. In the shown circuit, if the value of I_3=2A what is the value of I_2?



a) 1A **b) 2A** **c) 3A** **d) 4A**

3. A uniform cross sectional copper wire was shaped as a rectangle {kyxm} as in figure, its length is double its width, Which two terminals should be connected to the electric source to obtain the greatest electric resistance?



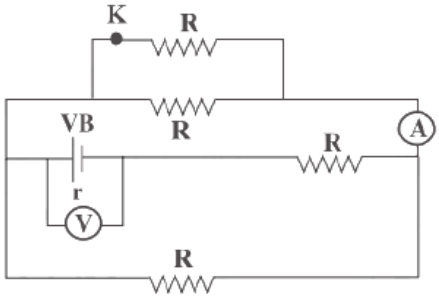
a) M , k

b) k , y

c) x , y

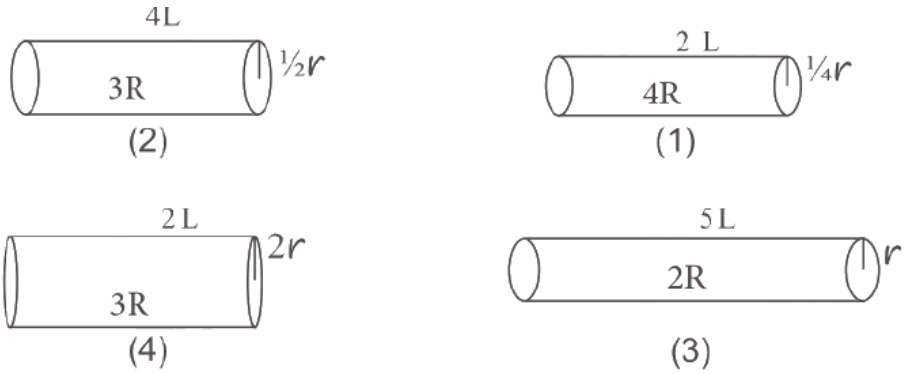
d) k , x

4. (Egypt 2023) The figure illustrates a closed electric circuit, when the switch k is opened so,.....



A. The ammeter reading decreases, while the voltmeter reading increases
B. The ammeter reading increases, while the voltmeter reading decrease
C. The reading of both ammeter and voltmeter decrease
D. The reading of both ammeter and voltmeter increase

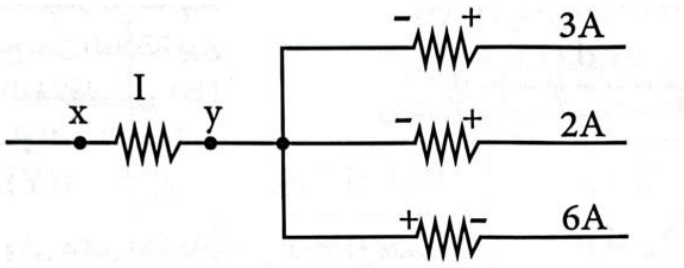
5. Egypt 2023) Four wires of different material, using the date on the figure, which wire has greatest conductivity



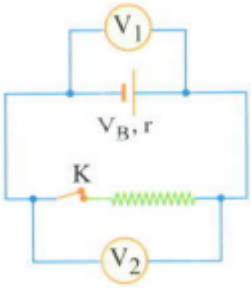
A. Wire1
B. Wire2
C. Wire3
D. Wire4

6. In the opposite figure, part of electric circuit, then the value of I equal.....

A. 4A
B. 2A
C. 1A
D. 11A



7. If the switch K is opened in the opposite electric circuit , then which of the following readings of the voltmeter (V_1, V_2) are correct …



	V_1	V_2
a	0	0
b	0	V_B
c	V_B	0
d	V_B	V_B

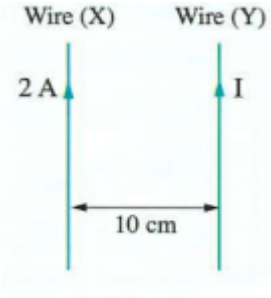
8. A long straight wire carries electric current of intensity I as in the figure, which one from the following expressions relates correctly the magnetic flux density (B) that is produced due to the current through the wire at two of the points x, y and z that lie in the same plane of the wire?

   a) $B_x > B_y$
   b) $B_y < B_z$
   c) $B_z > B_x$
   d) $B_z > B_y$

9. A straight wire was wound in the form of a circular coil of N tums and a current of intensity I was set up in it. If it is reformed so that the number of tums becomes $\frac{N}{4}$ the same current intensity is set up in it, the magnetic flux density at its center will be . . .... of its initial value

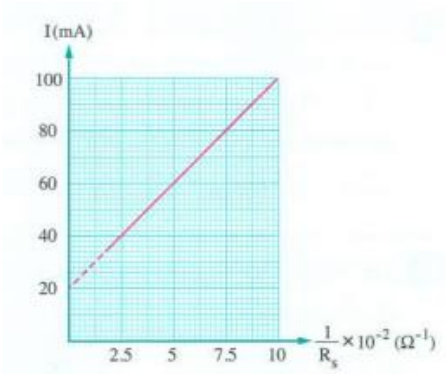
   a) $\frac{1}{16}$ b) 16 times c) 4 times d) $\frac{1}{4}$

10. The figure represents two parallel straight wires (X) and (Y). if the force acting on a unit length of each wire is 4 x 10^{-5}N/m, the passing electric current intensity (I) in wire (Y) equals ....



   a) 0.1A
   b) 1A
   c) 100A
   d) 10A

11. The opposite graph represents the relation between the maximum current intensity that could be measured by an ammeter and the reciprocal of its shunt resistor, so the value of the galvanometer resistance R_g =. .....Ω

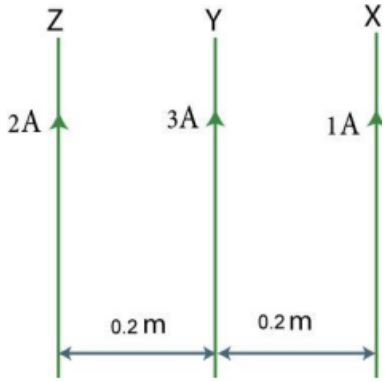


a) 40 b) 80
c) 20 d) 100

12. If the magnetic torque acting on a current-carrying coil while being placed in magnetic field = 0.86 N.m when the angle between the normal to coil plane and the direction of field = 60^0, so the magnetic torque acting on the coil when the coil plane becomes parallel to the magnetic field = ...

a) 1N.m b) 1.5N.m c)1.86N.m d) zero

13. From the data in the figure,
which of the following choices represents the correct arrangement of magnetic forces per unit length acting on each wire ?

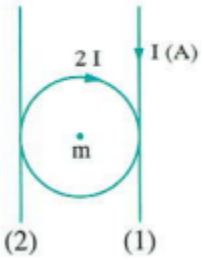


a) $F_y < F_x < F_z$
b) $F_z < F_y < F_x$
c) $F_x < F_y < F_z$
d) $F_y < F_z < F_x$

14. ohmmeter contains a galvanometer that shows a full-scale deflection when a current Ig passes in it, when an external resistor 50 kΩ , is connected to its two terminals, the passing current becomes $\frac{1}{3} I_g$ so the external resistance that makes the current passing in the ohmmeter become $\frac{3}{4} I_g$ equals.....

a) $\frac{25}{3} K\Omega$ b) $\frac{225}{2} K\Omega$ c) $\frac{50}{3} K\Omega$ d) $\frac{50}{4} K\Omega$

15. A metallic ring was carrying electric current of intensity (2I), a magnetic flux of density (B) was generated at the center of the ring (m). If two straight current-carrying wires (1) and (2) were placed tangent to the ring and in the same plane as in figure. So, to make the resultant magnetic flux density due to the three electric currents has the same value (B) at the center (m), the electric current intensity that passes in wire (2) =……and its direction =……

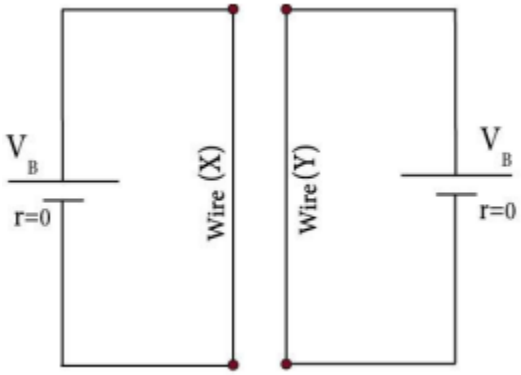


a) (I) , to the top of the page
b) (I), to the bottom of the page
c) (2 I), to the bottom of the page
d) (2 I), to the top of the page

16. A voltmeter, its resistance is 100 C) and the maximum voltage that can be measured by it is I V. The value of multiplier resistance that should be connected to increase the measured voltage by 10 times equals ...

a) $0.9K\Omega$ b) $10K\Omega$ *c)* $1.1K\Omega$ *d)* $1K\Omega$

17. battery of negligible internal resistance , the mutual force between them is (F) .When wire X is replaced by another one of same length and radius but the resistivity of its material is ¼ of that of wire X ,so the mutual force between the two wires becomes ……

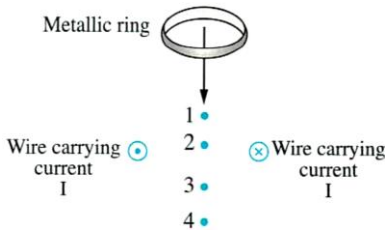


a) 2F b)F c) 4F d) F\4

18.A step-down transformer has efficiency of 90%, the ratio between potential difference of its two coils is 4/7 and the electric current passes in the primary coil is 10 A. If the number of turns of the primary coil is 4O0 tums, which choice of the following correctly expresses the values of (I_s) and (N_s)?

	I_S	N_S
a	15.75 A	229 turns
b	17.5 A	229 turns
c	15.75 A	254 turns
d	17.5 A	254 turns

19. The figure shows two straight current-carrying wires placed perpendicular to the page. If a metallic ring moves into the plane of the page and downwards to cut the resulted magnetic held due to the currents if the two wires such that the plane of the ring remains perpendicular to the page. At which points (1, 2, 3,4) an induced electric current is generated in the ring and produces a magnetic field opposite to the original magnetic field at the mid-point between the two wires?

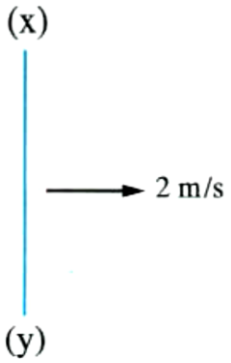


a) 1,3
b) 2,3
c) 1,2
d) 1,4

20. Two circular coils (l) and (2) have number of tums (N_l) and (N_2) respectively. If they have the same area and are placed in a magnetic flux perpendicular to their plane. When the magnetic flux density linked with the two coils changes with the same rate, it is noticed that the average induced electromotive force in coil (2) equals quarter that induced in coil (1). So……

a) $N_1=0.25N_2$
b) $N_1=8N_2$
c) $N_1=4N_2$
d) $N_2=8N_1$

21. The figure shows a part of closed circuit that contains a straight wire (xy) of length 20 cm moving at velocity of 2 m/s perpendicular to the direction of a uniform magnetic flux, that produces and induced electromotive force of 0.02 V between [the two terminals of the wire where the electric potential of point (x) is more than that of point (y). Then, the magnitude and the direction of the magnetic flux density

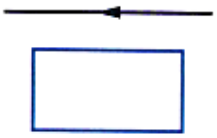


a) O.O5 T, perpendicular into the page
b) O.O5 T, perpendicular out of the page
c) O.5 T, perpendicular into the page
d) O.5 T, perpendicular out of the page

22. A dynamo coil starts rotation from the perpendicular position at a frequency of 50 Hz, it produces a maximum electromotive force of 100 V So, the time needed for the instantaneous induced electromotive force to reach 50 V for the second time from the beginning equals……second

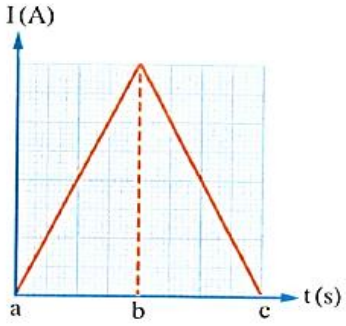
a) 1/600 b)1/200 c)1/400 d)1/120

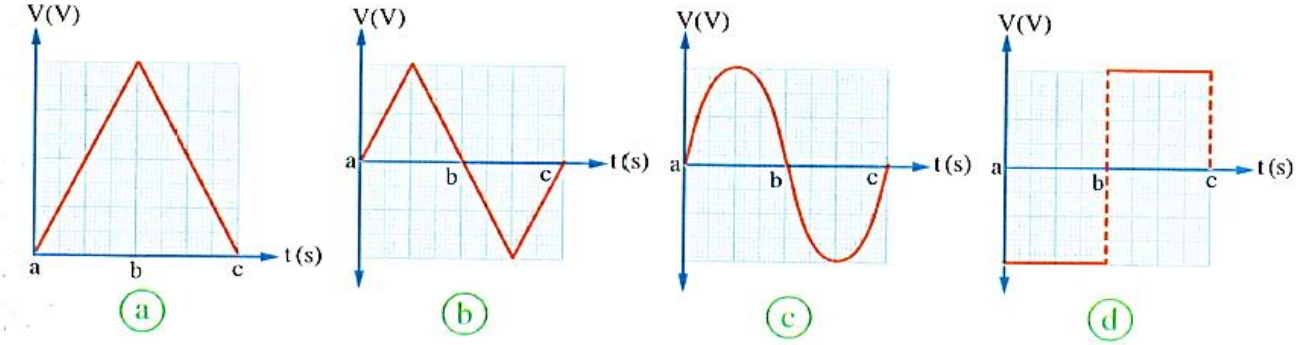
23. A straight wire carries an electric current below which and in the same plane a rectangular metallic frame is placed as shown in the figure, so in order for an induced current to be generated in the frame and in the clockwise direction, the wire must be moved in the plane of the page to…….



a) the right
b) the left
c) the upward
d) the downward

24. The opposite graph represents the change of the intensity of the electric current that passes through an induction coil with time, so which of the following graphs represents the change of the induced potential difference across the two terminals of the coil with the time?.....





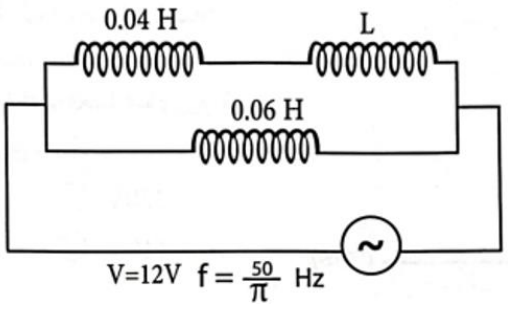
25. Energy conversions in induction furnaces are as ……

a) thermal → electrical → magnetic
b) electrical → thermal → magnetic
c) magnetic→ thermal → electrical
d) electrical→ magnetic → thermal

26. An electric bell works at a power of 1 W when an electric current of 0.5 A passes through. it. If it is connected to a transformer of efficiency 95% in which the number of tums in its secondary coil is 0.01 of that in its primary coil, find the voltage of the source connected to the primary coil equals……

a) 105.26V
b) 110.34V
c) 210.53V
d) 215.62V

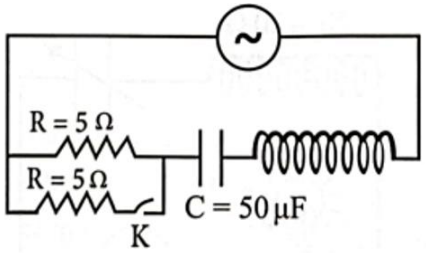
27. Three inductors with non ohmic resistance connected with alternating source, so the self-induction coefficient (L) when electric current (3A) passes through a circuit is ……



a) 0.08mH b) 80mH
c) 40mH d) 120mH

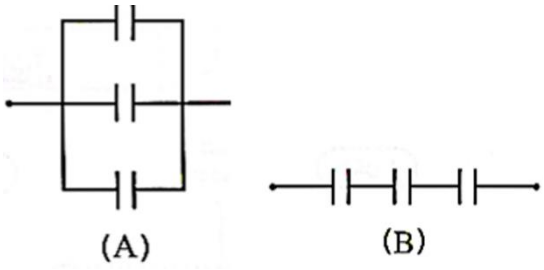
28. The opposite figure represents an alternative circuit (F=50HZ) if inductive reactance of a coil equals 63.63Ω , when closing switch (K) ,so……

a) V lags I by angle 90^0
b) V leads I by angle 45^0
c) V lags I by 45^0
d) V and I have the same phase



29. Three capacitors are connected as shown in the figure a capacitance of each of them is $12\mu F$ connected with alternative source its voltage is 20V, so $\frac{Q_A}{Q_B}$= …….

a) $\frac{9}{1}$ b) $\frac{1}{9}$
c) $\frac{3}{1}$ d) $\frac{1}{3}$



30.A receiving circuit contains ringing circuit composed of coil its self-inductance 1H and capacitor its capacitance 3.5μF ,so the resonance frequency equals…….

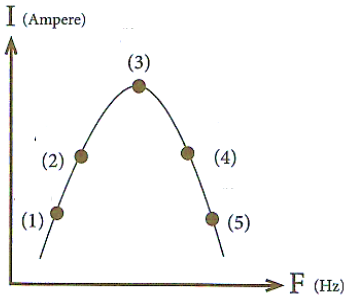
a) 45.495KHz b) 85.11Hz c) 0.085Hz d) 13.55Hz

31.An electric current (I) passes through hot wire ammeter , when increasing the value of electric current to ($2I$) ,so…..

	Expansion of (platinum- iridium) wire	Thermal energy which produced in a wire through unit of time
a)	Increase	Increase to double
b)	Decrease	Decrease to half
c)	Increase	Increase to 4 times
d)	Decrease	Decrease to quarter

32.An alternating circuit has an ohmic resistance and inductive coil with non ohmic resistance and capacitor with variable capacity ,so which points have potential difference greater than potential difference between terminals of coil ……..

a) 2,3 b) 4,5 c) 1,2 d) 2,4



questions from 33:46 (2 marks):

33.In the shown closed electric circuit , The value of V_B =

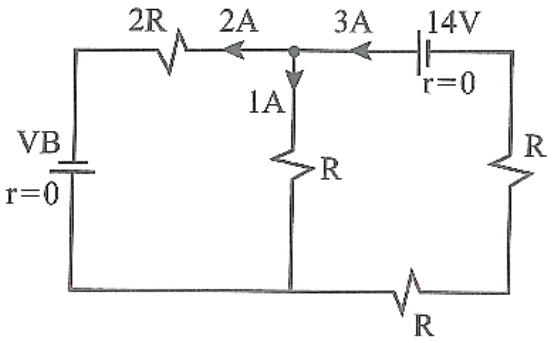
.....

a) 10 V

b) 4 V

c) 15 V

d) 6 V



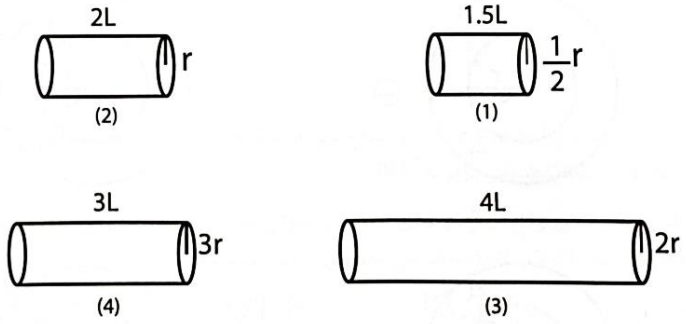
34.You have four copper wire, which of them has lowest resistance?

A. Wire 1

B. Wire 2

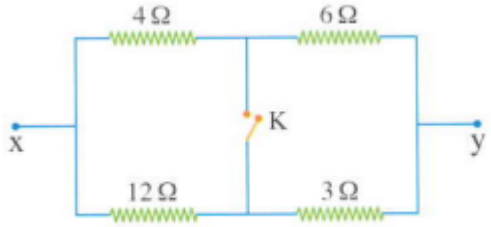
C. Wire 3

D. Wire 4



35.The opposite figure shows apart of an electric circuit , so the ratio between the total resistance of the connected set of resistors between the two points x,y before closing the switch k and after it's closing $(\frac{R_1'}{R_2'})$ is .....

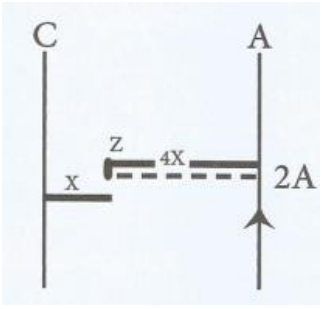
a)$\frac{6}{5}$ b)$\frac{3}{2}$ c)$\frac{2}{1}$ d)$\frac{5}{2}$



36.An ohmmeter contains a galvanometer of current full-scale deflection I_g, When an external resistor (R) is connected to its two terminals, the passing current becomes $\frac{3}{4}I_g$, then when the resistor (R) is replaced with another resistor of value (3 R) , the passing current becomes.... ..

a) $\frac{1}{4}I_g$ b) $\frac{1}{3}I_g$ c) $\frac{4}{9}I_g$ d) $\frac{1}{2}I_g$

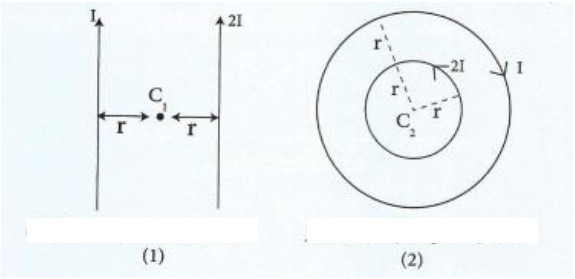
37.The opposite figure represents two straight parallel wires (A) ,(C) passes through each of them an electric current to get a neutral point at point (Z) , so which of the following choices represent the value and direction of electric current in wire (C) correctly?



a) 2A in the same direction of current in wire (A)
b) 0.5A in the same direction of current in wire (A)
c) 0.5A in the opposite direction of current in wire (A)
d) 2A in the opposite direction of current in wire (A)

38.From opposite figures : which of the following choices is correct?...

a) $B_{C1} = B_{C2} = 0$
b) $B_{C1} > B_{C2}$
c) $B_{C1} = B_{C2} \neq 0$
d) $B_{C1} < B_{C2}$



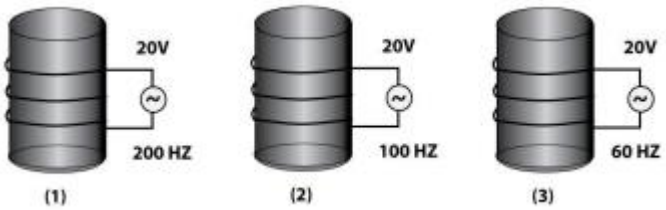
39.The number of turns of one of the coils of an ideal step-up transformer is double the number of turns of the other coil, then which of the following choices may represent the voltage across each of its coils?

	The voltage across the primary coil	The voltage across the secondary coil
(a)	90 V	180 V
(b)	180 V	220 V
(c)	90 V	160 V
(d)	180 V	200 V

40. A Copper wire of length (L) connected to a galvanometer. If the wire is moved with velocity (V) perpendicular to an electric field of magnetic flux density (B) , the pointer of the galvanometer deflects momentarily with an angle Θ. and when the velocity of the wire is increased to (2V) and the flux density is increased to (2B), then the pointer of the galvanometer will deflect momentarily with an angle equals…….

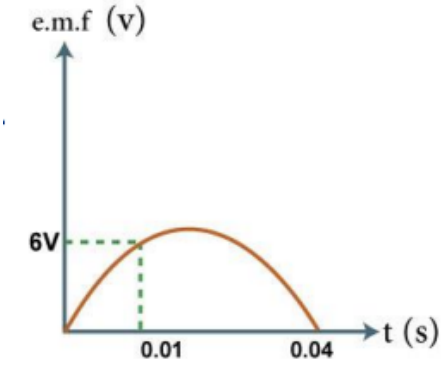
a) 2θ
b) 4θ
c) 6θ
d) θ

41. The figure shows three identical metallic blocks inside three identical coils, if an alternating current with the same voltage (but with different frequencies) passes through the three coils for the same time, then the temperature of the three blocks increased, which of the following choices is correct concerning the temperature (T) of the three blocks



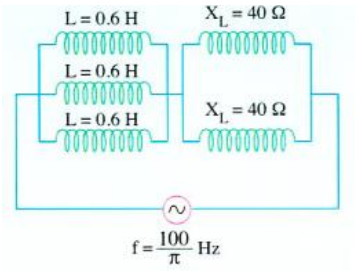
A. T1 > T2 > T3
B. T2 > T1 > T3
C. T2 > T3 > T1
D. T3 > T1 > T2

42. The graph illustrates the relation between the induced electromotive force of dynamo coil and the time , the effective value of induced electromotive force is ……



A. 6 v
B. $6\sqrt{2}$ v
C. 12 v
D. $12\sqrt{2}$ v

43. In the shown electric circuit, the equivalent inductive reactance equals to ..... .



a) 40Ω b) 60Ω c) 20Ω d) 80Ω

44. The figure illustrates two capacitors of the same capacitance (C) connected in series. When a third capacitor of capacitance that equals half the capacitance of one of the two capacitors is connected in parallel between (A, B). So, the total capacitance of the three capacitors equals.....

a) C b) 2C c) $\frac{C}{2}$ d) $\frac{3}{2}C$

45. Resonant circuit of frequency 2 x 10^{14} Hz has a capacitor of capacitance (C) farad and a coil of self-induction (L) Henry, if the capacitance is increased to (9 C) farad and self-inductance of the coil decreases to ($\frac{L}{9}$) Henry, what is the resonance frequency ?

.....
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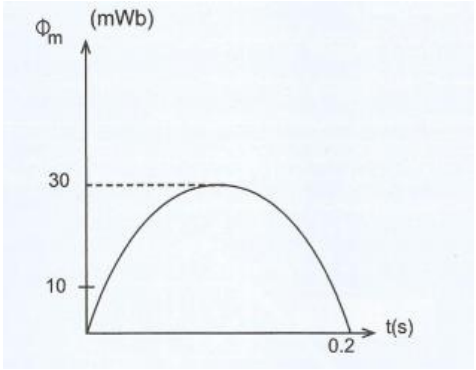
46. The opposite figure represent the change of magnetic flux of a coil start its motion from parallel position and time if you know that number of turns is 200 ,so the value of average induced emf in 0.2 sec equal.....



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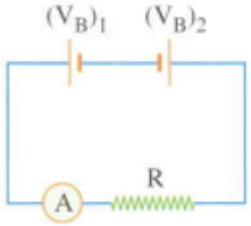
EXAM(9)

1. Two metal wires , the resistance of the first double that of the second , are connected together in parallel to a battery of negligible internal resistance , then the ratio between the rates of generating thermal energies in the two wires $(\frac{P_{w1}}{P_{w2}})$ equals .....

a)$\frac{1}{4}$ b)$\frac{1}{2}$ c)$\frac{2}{1}$ d)$\frac{4}{1}$

2. In the opposite figure , if the polarity of one of the two cells of the battery is reversed , then the reading of ammeter .....

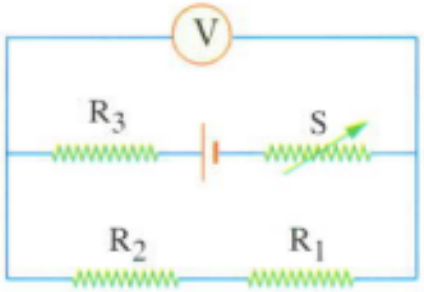


a)increase b)decrease
c)remains unchanged d)indeterminable

3. A group of equal resistors are connected in series , so their equivalent resistance s 100 Ω and when they are connected in parallel , their equivalent resistance become 4 Ω , then the resistance of one resistor of them is .....

a)100 ohm b)50 ohm c)20 ohm d)200 ohm

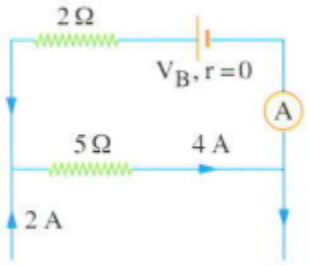
4. The opposite diagram represent a closed electric circuit , so when the variable resistance (S) is increased , then the reading of V .....



a)increase
b)decrease
c)remains constant
d)increase the decrease

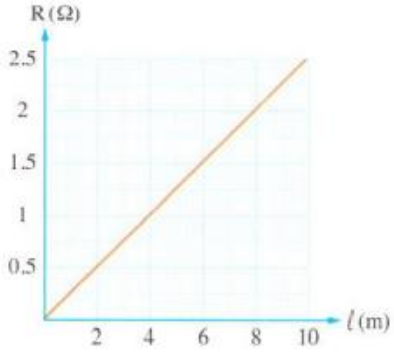
5. The opposite figure illustrate section of an electric circuit , so the ammeter reading (A) equals .....

a)1A
b)2A
c)4A
d)6A



6. The opposite graph represent the variation of the resistance R for each wire of a group wires that are made of the same material and have the same cross-sectional area of $0.2mm^2$ with respect to the length of each wire , so the resistivity of the material of these wires equals .....

a)$10^{-8}\Omega.m$ b) $2.5\times10^{-8}\Omega.m$
c)$5\times10^{-8}\Omega.m$ d)$7.5\times10^{-8}\Omega.m$



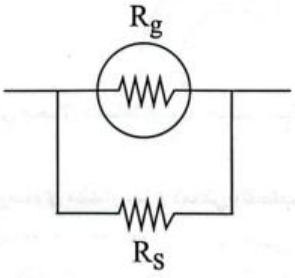
7. A battery of emf 12V , whose internal resistance is 1 ohm , is connected to an ammeter of negligible resistance , a constant resistance R ad rheostat together in series when the slider of the rheostat is adjusted at the start of rheostat , an electric current of 1.5A passes in the circuit and when the slider is adjusted at the end of rheostat an electric current of $\frac{1}{7}A$ passes in the circuit , so the maximum resistance of the rheostat equals .....

a)76 ohm b)72 ohm c)65 ohm d)62 ohm

8. from the opposite figure which of the following choices represents the correct arrangement of sensitivity of a galvanometer

a) Z>W>X>Y
b) X>Z>W>Y
c) Y>W>Z>X
d) W>Y>Z>X

R_S	
20 Ω	W
5 Ω	X
40 Ω	Y
10 Ω	Z



9. Two straight wires (B,A) passes through them electric currents I , $2A$ respectively and in opposite direction and distance between them is 5cm , and common length between them is 10cm ,so the mutual force is $2.4 \times 10^{-6} N$

What is the value of electric current (I) and type of magnetic force ?

	Current intensity	Type of force
a)	3A	Repulsion
b)	3A	Attraction
c)	6A	Repulsion
d)	6A	Attraction

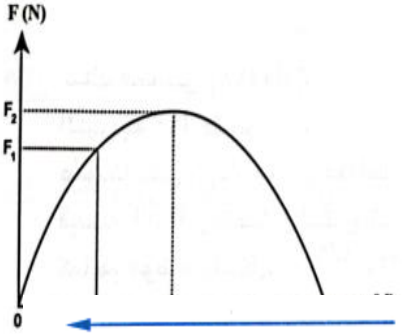
10. The opposite figure represents the relation between emf which generated in straight wire its length is (L) passes through it a current (I) it placed parallel to a magnetic field its density is (B) and change in angle (θ) between wire and field if $\frac{F_2}{F_1} = \frac{2\sqrt{3}}{3}$,so the value of X=.....

a) 45

b) 75

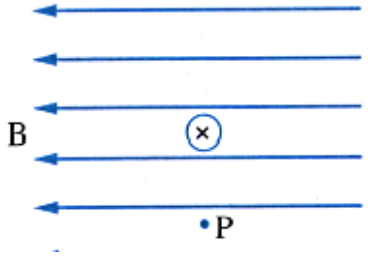
c) 60

d)80



11. In the opposite figure a long straight wire carries an electric current of 40 A whose direction is perpendicular into the plane of the page. The wire is placed in a uniform magnetic field of density 6×10^{-5} T that is directed to the left of the page, so the resultant of the magnetic flux density at point P which is 10 cm away from the axis of the wire is.....

(Where : $\mu = 4\pi \times 10\text{-}7$ Wb / A.m)

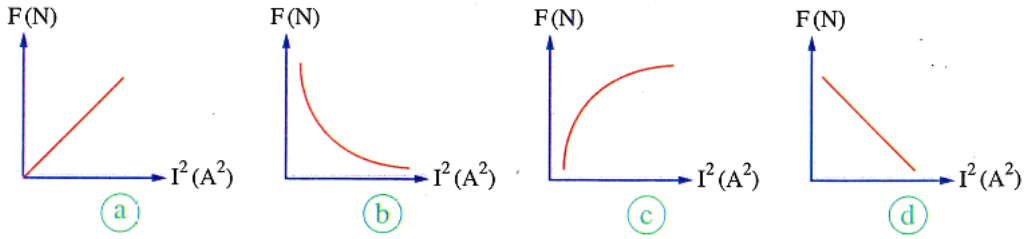


a) 1.4×10^{-4}T b) 1×10^{-4}T c)8×10^{-5}T d)2×10^{-5}T

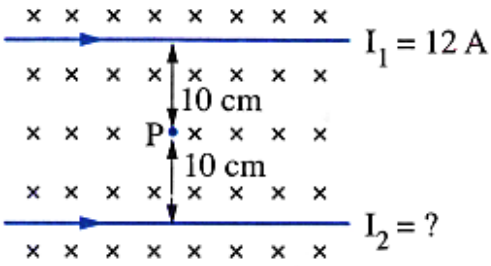
12. The opposite figure represents an ohmmeter scale that has equal divisions. When an external resistance is connected between the two terminals of the device, its pointer has deflected to position x on the scale of the current, so the value of this resistance is…… the resistance of the ohmmeter.

d) three times c) double b) half a) one third

13. Which of the following graphs represents the relationship between the mutual magnetic force (F) between two long parallel straight wires through which the same electric current intensity is passing and the square the intensity of the electric current (I^2)?



14. The opposite figure shows two very long and parallel straight wires that are placed in the plane of the page affected by a uniform external magnetic field of flux density 2×10^{-5} T whose direction is perpendicular into the plane of the page, if the resultant magnetic flux density at point P equals 2×10^{-5}T and its direction is into the page, so the electric current intensity that passes through the second wire equals……

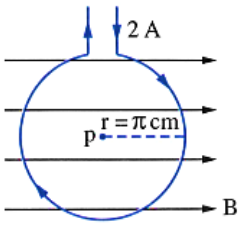


a) 24A b) 18 A c) 12 A d)6A

15. If the torque affecting a coil carrying an electric current was 12 N.m when its plane was parallel to a magnetic flux density of 0.3 T, then the magnetic dipole moment for that coil equals……

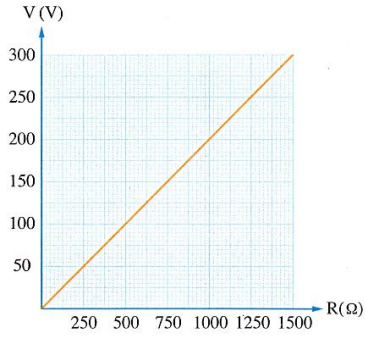
a) 30 A.m2 b) 40 A.m2 c) 50 A .m2 d) 60 A .m2

16. In the opposite figure, a metallic ring that carries an electric current is placed parallel to a uniform magnetic field B of density $3x10^{-5}$ T, then the value of the total magnetic flux density at the center of the ring (p) is.....
(Where : $\mu_{air} = 4\pi \times 10^{-7}$ Wb/A.m)



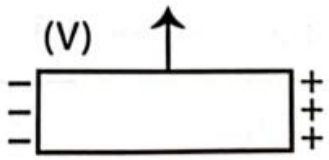
a) 1×10^{-5} T b) 4×10^{-5} T
c) 5×10^{-5} T d) 7×10^{-5} T

17. A sensitive galvanometer that can measure an electric current of maximum intensity I is connected to different multiplier resistors severally to be converted into a voltmeter. The opposite graph represents the relation between the maximum potential difference that can be measured by the voltmeter (V) and the total resistance of the voltmeter (R), so the value of I is.....

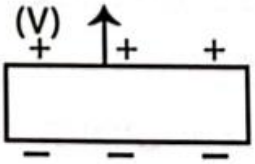


a) 0.1 A b) 0.2 A c)0.25 A d)0.5 A

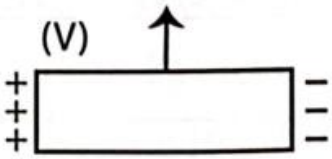
18. In the opposite figure a straight wire moves with velocity (V) and affected by uniform magnetic field its direction is perpendicular into the page which of the following figures represents the movement of electric charges ?



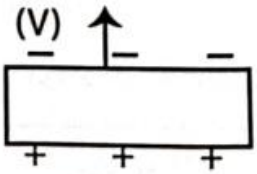
(a)



(b)



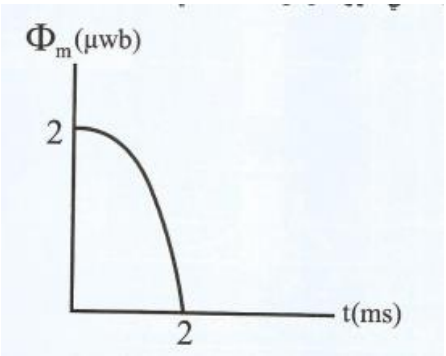
(c)



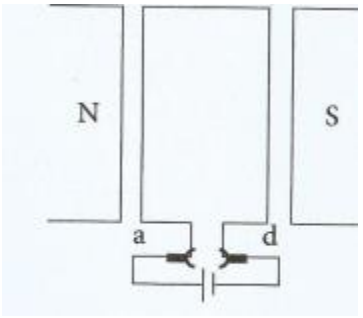
(d)

19. A straight wire its length is (L) moves with velocity (v) in a magnetic field its density is (B) it inclined with angle 30 on a flux ,so the induced emf will produced to increase induced electro motive force to double …….
    a) Change wire with anther wire its length (4L)
    b) Moves with velocity (3V)
    c) Wire moves in magnetic field density $(\frac{1}{2}B)$
    d) Wire moves perpendicular on a magnetic field

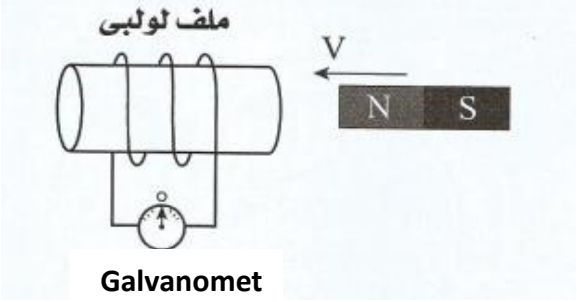
20. In the opposite figure :what is the instantaneous emf of a coil after 0.1ms from start of motion ?
    a) 0.0025V
    b) 0.25V
    c) 0.025V
    d) 0.00025V



21. You have a motor for a direct current it has one coil start its motion from parallel position as shown in the figure , when coil rotate with angle 60 in clockwise direction ,so…….
    a) Magnetic torque remains constant through rotation
    b) Magnetic force on wire (bc) equals half maximum value
    c) Magnetic torque$= \frac{\sqrt{3}}{2}$ from maximum value
    d) Magnetic force on wire (ab) remains constant



22. The opposite figure represents a magnet moves with velocity (V) to left toward a solenoid and not produce an induced current because solenoid moves…..
    a) To left with velocity (V)
    b) To left with velocity (2V)
    c) To right with velocity (V)
    d) To right with velocity (2V)



23. An alternating current dynamo , the area of the face of its coil is 0.02 m2 rotates with a rate of 1400 cycle /minute in a field of magnetic flux density 0.01 T, and its number of turns is 300 so the instantaneous induced electromotive force in the coil when the coil plane makes angle 60 with the direction of magnetic field is …….

A- 8.8 v
B- 4.4 v
C- 7.62 v
D- 2.2 v

24. A wire of length 0.2m is moved with velocity 2m/s in a direction makes an angle 30 with magnetic flux lines of density 0.4 T so, the instantaneous induced electromotive is ……..

A- 0.16 v
B- 0.32 v
C- 0.08 v
D- 0.24 v

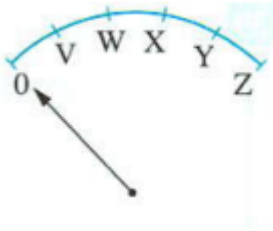
25. The physical quantity whose value in the secondary coil of an ideal step-up electric transformer is lower than that in the primary coil is

a) the electric power
b) the maximum value of current
the frequency of the current
d the magnetic flux

26. It is required to transfer an electric power of 300 kW from a power station to one of the factories through a line of resistance 0.8Ω, if the potential difference at the station is 1200 V, then……

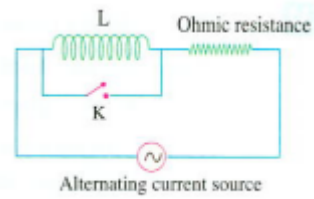
	The drop in voltage	The transmission efficiency
(a)	200 V	78.67 %
(b)	200 V	83.33 %
(c)	400 V	78.67 %
(d)	400 V	83.33 %

27. The figure illustrates the scale of a hot wire ammeter where the spaces between the positions marked on the scale are equal. When a current of intensity (I) passes through the wire of the device, the pointer deflects to the position V. Which of the following choices represent the current intensity passing through the wire of the device when the pointer deflects to the position Y?



a) 2 I b) 3 I c) 4 I d) 5 I

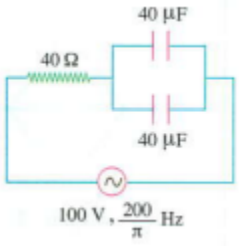
28. An AC circuit contains a non-inductive ohmic resistance and a coil of self inductance (L) of negligible ohmic resistance so that the phase angle between the voltage and the current is (θ). When the key (K) is closed, so the phase angle.....



a) becomes zero b) doesn't change

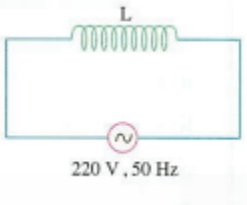
c) increases d) decreases but doesn't equal zero

29. In the shown electric circuit: The phase angle between the total potential difference (V_t) and the current intensity (I) equals.....



a) 38° b) 35° c) -38° d) −35°

30. In the shown circuit, an alternating current source (220 V, 50 Hz) is connected to an inductive coil of self-inductance (L) with negligible ohmic resistance. Current of intensity 2 A passes in the coil. So, the self-inductance of the coil (L) equals.....

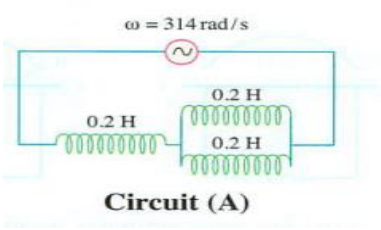


a) 0.7 H b) 0.35 H c) 4.4 H d) 0.04 H

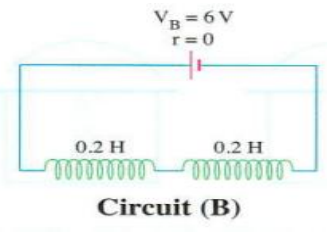
31. (A) and (B) are two different electric circuits as shown:

The inductive reactance for circuit A= .....

While that for circuit B=.....



Circuit (A)



Circuit (B)

a) 94.2Ω, zero Ω b) 94.2Ω, 125.6Ω

c) 62.8Ω, zero Ω d) 62.8Ω, 125.6Ω

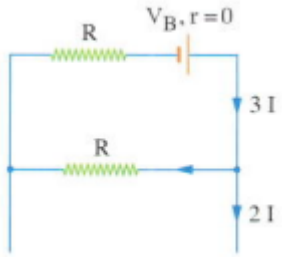
32. A tuning circuit (X) consists of an inductor with inductance 0.2 H and a capacitor of capacitance 0.2 pF Another tuning circuit (Y) consists of an inductor of inductance 0.4 H and a capacitor of capacitance 0.1 pF, then the ratio of : $\frac{\text{the resonance frequency of circuit (X)}}{\text{the resonance frequency of circuit (Y)}}$ =

a) $\frac{2}{1}$ b) $\frac{1}{4}$ c) $\frac{1}{1}$ d) $\frac{4}{1}$

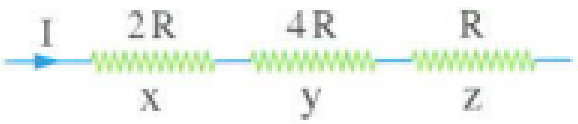
<u>questions from 33:46 (2 marks):</u>

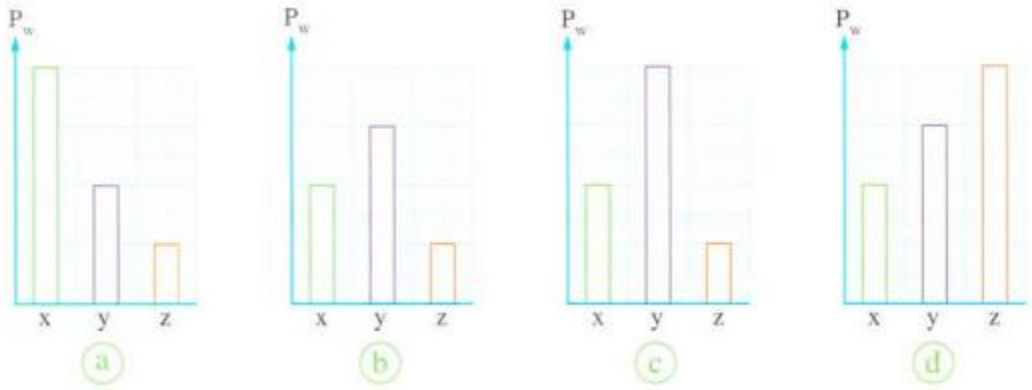
33.The opposite figure represent a section of an electric circuit , then the value of V_B equals .....

a)IR b)2IR c)3IR d)4IR

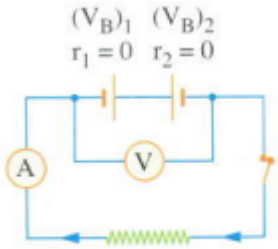


34.The opposite figure represents three resistors (x,y,z) connected in series . so , which of the following graphs represents the ratios of the consumed electric power in each of them ?





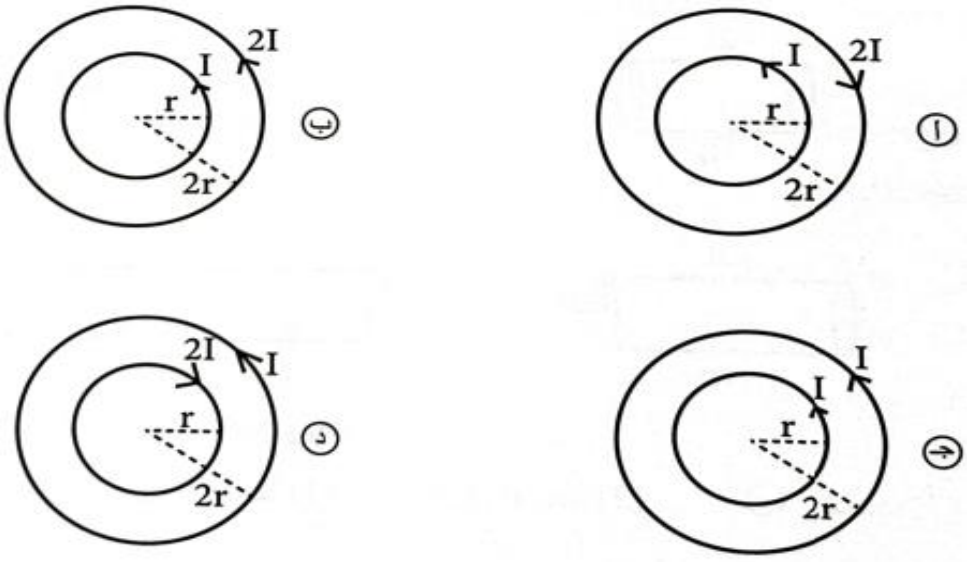
35.In the opposite electric circuit if we reversed the poles connection of the battery (V_{B_2}), then the reading of the voltmeter becomes (where $(V_{B1} > V_{B2})$)



a)0 **b)$(V_{B1}) - (V_{B2})$**

c) $(V_{B1}) + (V_{B2})$ **d)$2V_{B1}) - (V_{B2})$**

36.which of the following figures has the largest value of magnetic flux density at the center o coils ?



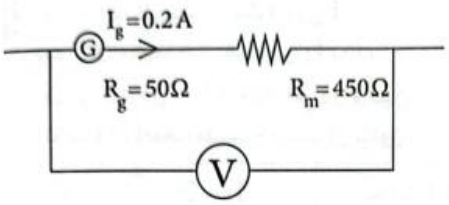
37. In the opposite figure: what is the value of maximum reading of voltmeter ?

a) 50V

b) 100V

c) 20V

d) 10V



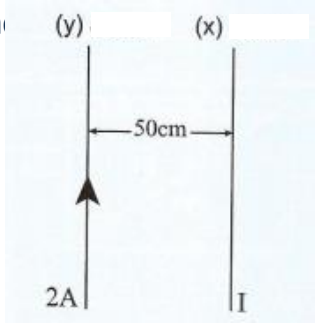
38. If force which is effected on wire (X) equals 2×10^{-6} N/m its direction is to right is resulted from magnetic field density which produced from wire (Y) , so th direction of I is …….

a) 2.5A upward

b) 2.5A downward

c)25A downward

d) 25A upward

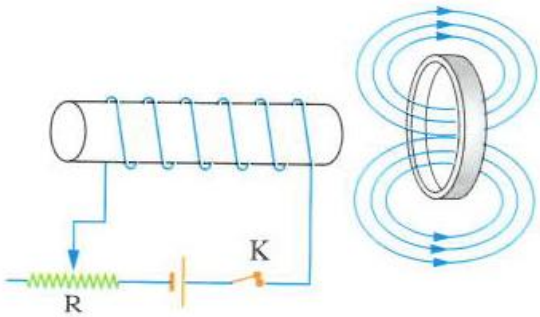


39.An electric transformer converts 200 V into 10 V, where the ratio between the number of
the turns of its coils is 15:1, so its efficiency equals…….

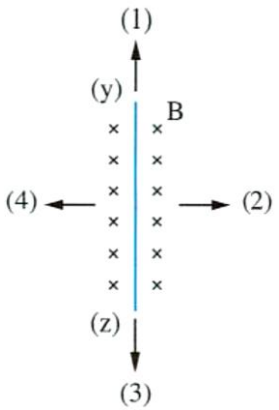
a) 60%
b) 75%
c) 90%
d) 97.5%

40.An induced magnetic field is initiated due to the flow of an induced current in the ring as in the opposite figure, when……

a) opening switch K
b) inserting an iron rod in the coil
c) decreasing the resistance of R
d) moving the ring towards the coil

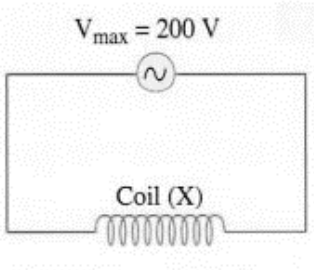


41. The figure represents a straight wire (yz) that is moving in a uniform magnetic field (B); hence an induced current is produced in the direction from (z) to (y). Toward what direction (1), (2), (3) or (4) the wire (yz) is moved?



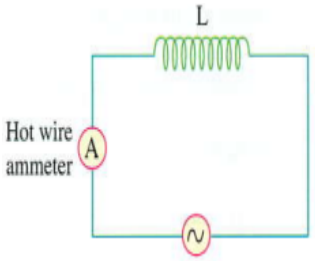
a) (1)
b) (2)
c) (3)
d) (4)

42. The opposite figure shows an AC source, whose maximum voltage is 200 V and its frequency is 50 Hz, connected to an inductive coil (X) of self-inductance (L) and negligible ohmic resistance. Given that the effective value of current passing in the circuit is 2 A, what are the value of self-inductance and the method of connecting another coil with coil (x) to double the effective value of the current in the circuit?



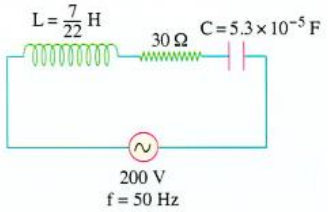
a) 0.22 H, in series.
b) 0.22 H, in parallel.
c) 0.32 H, in series.
D) 0.32 H, in parallel.

43. The opposite figure shows a series AC circuit containing an AC source of maximum voltage 250 V, an inductor of negligible ohmic resistance and a hot wire ammeter of resistance 12Ω. If the reading of the ammeter =10A. the inductive reactance of the coil=.....



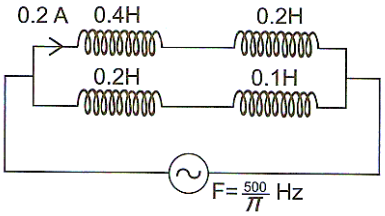
a) 17.67 Ω
b) 12.98 Ω
c) 21.93 Ω
d) 5.68Ω

44. The opposite figure shows an RLC circuit connected with an AC source of emf rated at 200 V and 50 Hz. Using the data on the figure, so the total impedance of the circuit approximately equals.....



a) 40Ω
b) 50Ω
c) 100Ω
d) 30Ω

45.From the opposite figure: what is the value of voltage of alternating source?



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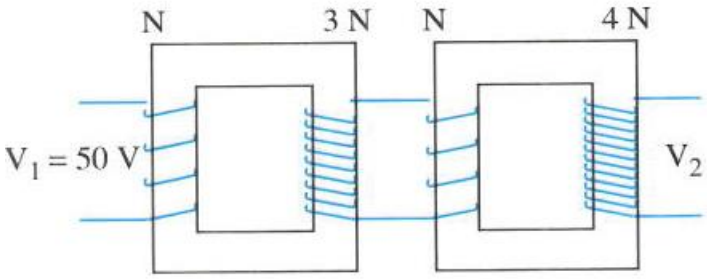
46.In the opposite figure, two ideal transformers are connected in series, then the value of V.

equals



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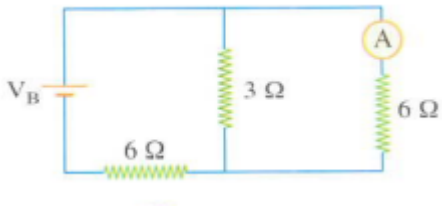
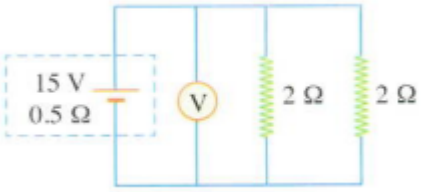
EXAM(10)

1. In the opposite electric circuit , the reading of the ammeter is 1.25A , so when replacing the ammeter position with the battery position , the reading of the ammeter becomes .....



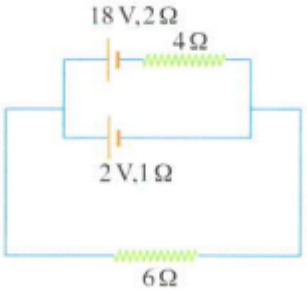
a)0.625 A b)1.25A c)3.75A d)2.5A

2. In the opposite electric circuit , the reading of the voltmeter is .....



a)9.5V b)10V
c)11V d)11.5V

3. In the circuit shown in the figure , the potential difference between the terminals of the 6 ohm resistor equals .....



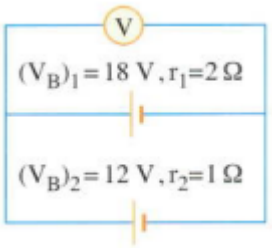
a)2.5V b)4.2V
c)3.75V d)6.25V

4. The opposite table shows the properties of four metal conductors made of different material (x,y,z,k) and have the same cross-sectional area , so which of these materials has the highest electrical conductivity ?

Conductor	Length of the conductor	Resistance of the conductor
x	2 m	1 Ω
y	3 m	4 Ω
z	3 m	6 Ω
k	1 m	4 Ω

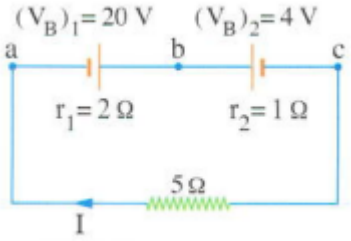
a)X b)y
c)Z d)K

5. In the opposite electric circuit . the voltmeter reading is ……



a)14V b)15V c)18V d)30V

6. In the opposite figure , the potential difference between a and b is ……..



a)14V b)15V
c)16V d)18V

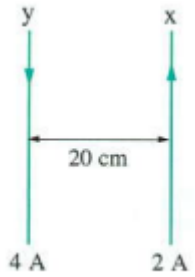
7. An electric circuit consists of an electric source of voltage 120V with a number of identical lightbulbs connected in parallel such that each of them consumes a power of 100 W , when a current of 15A passes through the source , hence the number of the lightbulbs in the circuit equals ……..

a)12 bulbs b)15 bulbs c)18 bulbs d)24 bulbs

8. A circular coil of number of tums N and radius r caries a current of intensity I, so a magnetic field of flux density B I is generated at its center. If the coil is connected to another electric source such that a current of intensity which equals three times its intensity in the first case passes through it, a magnetic field of flux density B_2 is generated at its center. So. ……..

a) $B_2 = 3B_1$ b) $B_2 = B_1$
c) $B_2 = \frac{1}{3}B_1$ d) $B_2 = \frac{3}{2}B_1$

9. The figure shows two parallel straight wires (x), (y), each of length 1.6 m and the normal distance between them is 20 cm, carrying electric currents of intensities 2 A and 4 A respectively. The mutual magnetic force between (x, y) is……..

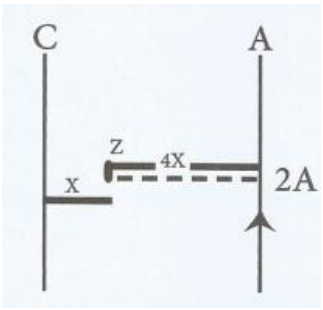


a) $1.28 \times 10^{-4} N$
b) $1.28 \times 10^{-6} N$
c) $1.28 \times 10^{-7} N$
d) $1.28 \times 10^{-5} N$

10. A 5 tums rectangular coil of dimensions 20 cm, 40 cm, is placed inside a magnetic field of flux density 0.02 T where the coil plane makes angle 55" with the flux direction. If electric current of 4 A intensity passes through the coil, then the affecting magnetic torque on that equals

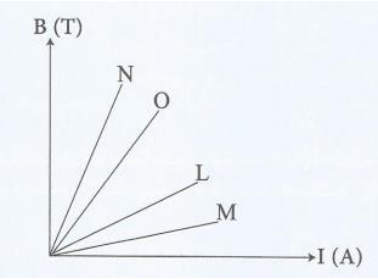
a) $18.4 \times 10^{-3} N.m$
b) $26.2 \times 10^{-3} N.m$
c) $320 \times 10^{-3} N.m$
d) $640 \times 10^{-3} N.m$

11. The opposite figure represents two straight parallel wires (A) ,(C) passes through each of them an electric current to get a neutral point at point (Z) , so which of the following choices represent the value and direction of electric current in wire (C) correctly?



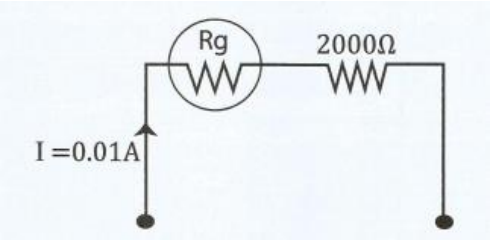
e) 2A in the same direction of current in wire (A)
f) 0.5A in the same direction of current in wire (A)
g) 0.5A in the opposite direction of current in wire (A)
h) 2A in the opposite direction of current in wire (A)

12. The opposite figure represents the relation between magnetic flux density at the center of solenoid for some coils and electric current which passes through them if you know that coils have the same number of turns and same permeability ,so which coil has shortest length?.....



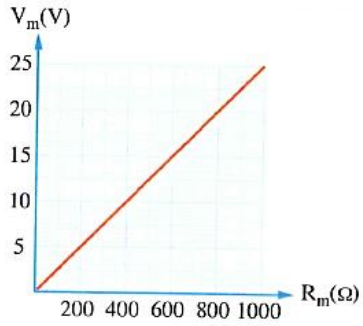
a) N
b) L
c) M
d) O

13. a galvanometer is connected to a resistor (2000Ω) series to convert it to voltmeter as shown in the figure . the maximum reading of voltmeter is 20.5V , to make voltmeter measures 10.25V we should replace resistance 2000Ω by resistance .....



a)1025Ω
b) 1000Ω
c) 975Ω
d) 4000Ω

14. The opposite graph represents the relation between the potential difference (V_m) across a multiplier resistance and the value of the multiplier resistance (Rm). If the maximum potential difference which the galvanometer's coil can withstand before connecting the multiplier resistance is 1 V, so the galvanometer's coil resistance equals……

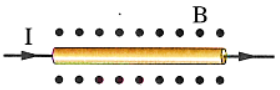


a) 40 Ω b) 50 Ω c)80 Ω d)100 Ω

15.If the pointer of the galvanometer deflects by an angle of 30°, when a current of 300 μA passes through it, then the galvanometer sensitivity equals……

a) $\frac{1}{3}$deg /μA b) $\frac{2}{3}$ deg /μA c) 0.1 deg /μA d) 0.15 deg /μA

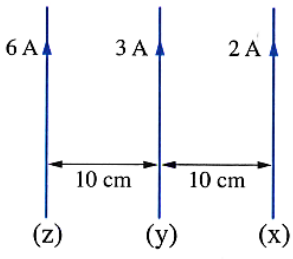
16.A wire of weight F is suspended horizontally parallel to the Earth's surface and perpendicular to a magnetic flux of density B as shown in the opposite figure, then when an electric current passes through the wire, the wire gets affected by a magnetic force of magnitude 2 F, so the resultant force on the wire equals…….



a) F b)2F c)$\sqrt{2}$F d)3F

17.The opposite figure shows three long straight parallel wires (x, y and z) that are placed in the same plane, so the magnetic force that acts on one meter of wire (y) and its direction are…….

(Knowing that: $\mu_{air} = 4\pi \times 10^{-7}$T.m/A)



a) 2.4×10^{-5} N/m, towards wire x
b) 2.4×10^{-5} N/m, towards wire z
c) 4.8×10^{-5} N/m, towards wire x
d) 4.8×10^{-5} N/m, towards wire z

18. An AC dynamo consists of 100 turns and a cross-recitational area of 250 cm^2 is rotating in a magnetic field of flux density 200 mT, starting from the perpendicular position to the field, the generated emf in the dynamo reaches its maximum value 100 times in one second. so the value of the effective induced emf =……

a) 157V
b) 111.1V
c) 222.2V
d) 314.3V

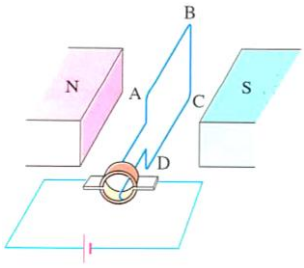
19. A student conducts the following steps by using the tools shown in the figure. Step (I): moving the magnet towards the stationary solenoid. Step (II): moving both the solenoid and the magnet with the same velocity and in the same direction, Step (III): moving both the solenoid and the magnet with the same speed but in two opposite directions. Which of the above steps does not produce an induced electromotive force in the coil?

a) step (I) only
b) step (II) only
c) step (III) only
d) all steps

20. In an ideal step-down transformer, the ratio between the number of its turns is 4, so if its secondary coil is connected to an electric bulb labelled (60 V - 20 A), which of the following choices expresses the value of (I_P) and (V_P) correctly.

	Primary coil current (I_p)	Primary coil voltage (V_p)
a	4 A	150 V
b	5 A	240 V
c	80 A	240 V
d	5 A	15 V

21. The figure illustrates the structure of a simple electric motor. The coil ABCD continues rotation from the vertical position due to .....

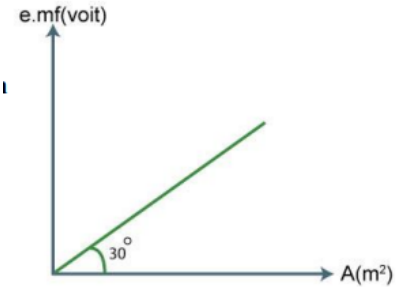


a) the force acting on wire (AB)
b) the force acting on wire (BC)
c) inertia of the coil
d) the force acting on the coil.

22. If the number of turns of a dynamo's coil is decreased to half its initial value and its angular speed (0) is increased to double its initial value, then the maximum induced electromotive force in the coil will

a) increase to double its initial value
b) decrease to half its initial value
certain unchanged
d decrease to quarter its initial value

23. A group of coils of different areas , the number of turns of each coil is 100 turns, are exposed to a variable magnetic flux at the same time. The following graph represents the relation between the average induced electromotive force in each coil and the area so the rate of change in magnetic flux density is .....



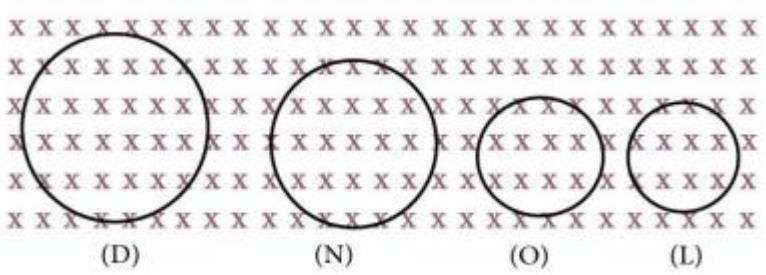
e) 0.577×10^{-3} T/s
f) 57.7×10^{-3} T/s
g) 577×10^{-3} T/s
h) 5.77×10^{-3} T/s

24. A step-up electric transformer has an efficiency of 80%, its primary coil is connected to an AC source of potential difference 240 V. If the ratio of the numbers of turns of the secondary coil to that of the primary coil is 1/5, then the potential difference between the terminals of the secondary coil is

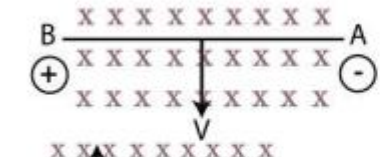
a) 960 V
b) 880 V
c) 640 V
d) 480 V

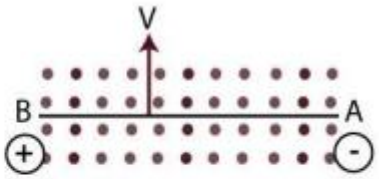
25. Four Copper rings of different radii all lie in the plane of the page and are exposed to a uniform magnetic field as in the figure. If the magnetic field vanishes at the same moment , which of the rings will have the greatest induced current?

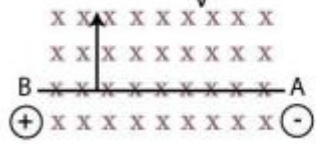
A- D
B- L
C- O
D- N



26. A copper wire AB of length (L) is placed in the same plane of the page, and then it is moved perpendicular to a uniform magnetic field, which of the following figures correctly represents the polarity of the wire terminals?

A-


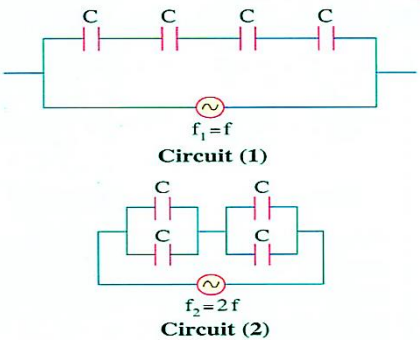
B-


C-


D-


27. In the two electric circuits, if the capacitance of each capacitor is C, the ratio of $\frac{\text{the equivalent capacitive reactance in circuit (1)}}{\text{the equivalent capacitive reactance in circuit (2)}}$ = ...

a) $\frac{1}{2}$ b) $\frac{2}{1}$ c) $\frac{8}{1}$ d) $\frac{1}{8}$



28. The opposite figure illustrates an inductive coil of negligible ohmic resistance in an alternating current circuit: If the source is replaced with another of lower frequency at constant (V), so .....

	The inductive reactance of the coil	The phase angle between total voltage and the current
a)	Decreases	Increases
b)	Increases	Decreases
c)	Decreases	Decreases
d)	Increases	Increases

29. The following four figures illustrate four similar capacitors, each of capacitance C.

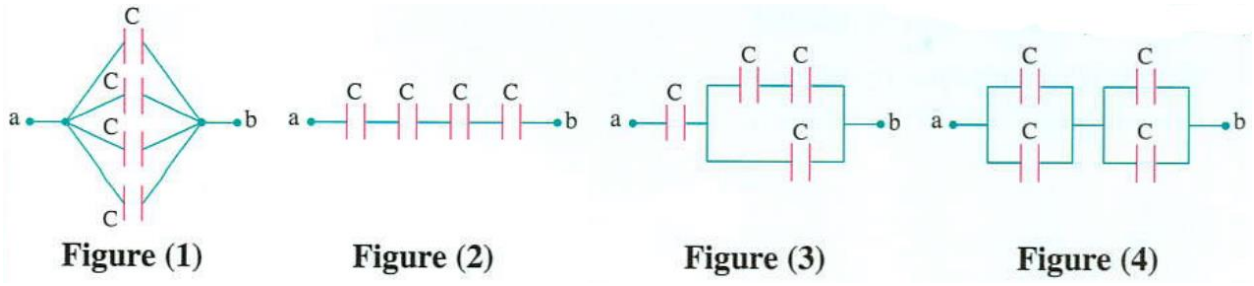
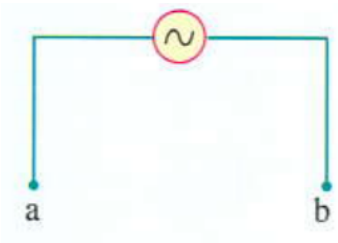


Figure (1) Figure (2) Figure (3) Figure (4)

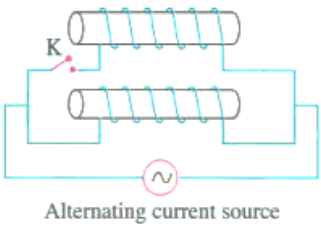
So, which figure should be connected between the points (a, b) to close the opposite electric circuit so that the electric current that passes through the circuit has the maximum value?



a) Figure (1) b) Figure (2)

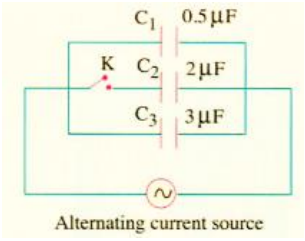
c) Figure (3) d) Figure (3)

30.The circuit shows two inductors of negligible ohmic resistance connected to an alternating current source. When the key (K) is closed the phase angle between the voltage and the current is .....



a) $180°$ b) $90°$ c) $45°$ d) zero

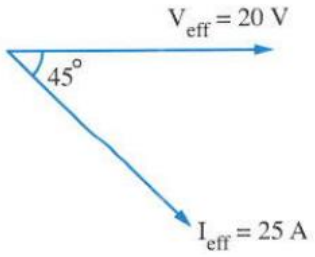
31. From the opposite electric circuit, the ratio between the total capacitance of capacitor before closing the key (K) and after closing it equals .....



a) $\frac{7}{11}$ b) $\frac{11}{7}$

c) $\frac{6}{1}$ d) $\frac{1}{6}$

32. The opposite figure shows the phasor diagram of the total voltage and the electric current intensity in an AC circuit, then this circuit could be



a) RC or RLC

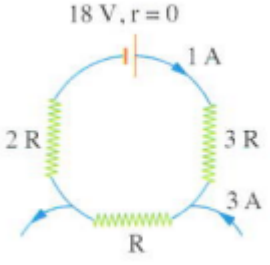
b)RC only

c) RC or R

d) RLC or RL

<u>questions from 33:46 (2 marks):</u>

33.The opposite figure represents a section of an electric circuit , so resistance R equals .....

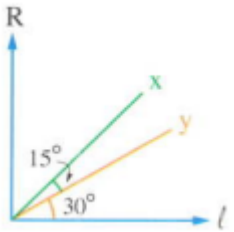


a)1 ohm
b)2 ohm
c)3 ohm
d)5 ohm

34. A uniform wire of resistance 120 ohm is cut into equal segments when these segments are connected together in parallel , their total resistance becomes 1.2 ohm so the number of these segments of the wire equals .....

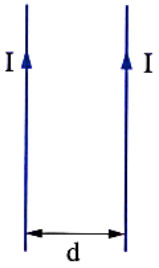
a)6 b)10 c)12 d)24

35. Two long copper wire x, y are different in thickness , where the opposite graph represent the relation between the resistance (R) and the length (L) taken from each wire , so the ratio between the cross-sectional areas of the two wires $(\frac{A_x}{A_y})$ is .....



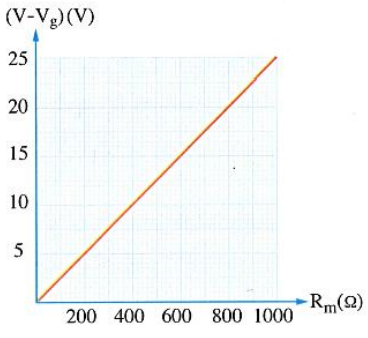
a)1/3 b)3/1 c)$\frac{1}{\sqrt{3}}$ d)$\frac{\sqrt{3}}{1}$

36. In the opposite figure, two parallel wires are at a distance d apart from each other where each carries an electric current of intensity I. If the current intensity is decreased in each of them to its half and also the distance between them is decreased to its half, then the mutual magnetic force between them.....



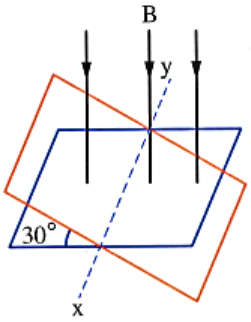
a) increases to its double b) decreases to its half
c) decreases to its quarter d) increases to its quadruple

37. The opposite graph represents the variation of the maximum voltage that can be measured by a galvanometer before and after connecting a multiplier resistance (V - Vg) with respect to the change of the multiplier resistance (Rm), so the maximum current that can be tolerated by the galvanometer equals.....



a) 0.01 A b)0.02 A
c) 0.025 A d) 0.045 A

38. In the opposite figure, a coil is placed perpendicular to a uniform magnetic field of flux density B, so the magnetic flux that penetrates the coil is φm, if the coil has rotated from this position by an angle of 30° about the xy axis, then the magnetic flux that penetrates the coil becomes…….



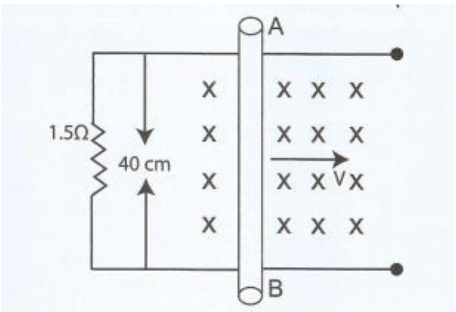
b) $\frac{\sqrt{3}}{2}\phi m$ b) $\frac{1}{2}\phi m$

c) 1/3ϕ d) 3 ϕm

39. When moved magnet in two directions (1) or (2) with same speed will produce an induced electromotive force its value is 0.5VB which of the follosing choices is correct at the moment of moving of magnet ?

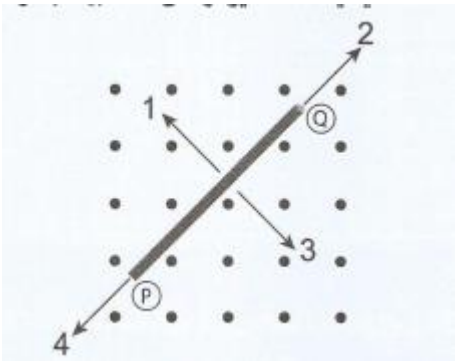
a) Brightness of a lamp will vanished momentally when magnet moving in diection(2)
b) Brightness of as lamp will increase when magnet moving in direction (2)
c) Brightness of a lamp will remain constant when magnet moving in direction (1) or (2)
d) Brightness of lamp will increase when magnet moving in direction (1)

40. In the opposite figure wire (AB) its resistance is 0.5Ω moves perpendicular on a magnetic field its density is 0.2T and an induced current which produced in a wire equals 0.1A ,so the wire moves with velocity…….



a) 1.5 m/s
b) 1.875 m/s
c) 2.5 m/s
d) 0.625 m/s

41. The opposite figure represents a straight wire is placed on uniform magnetic field if the direction of induced current from point (Q) to (P) , so the motion of wire in direction ……

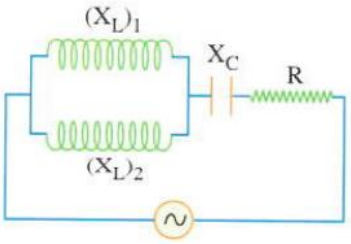


a) (1)
b) (3)
c) (2)
d) (4)

42. A dynamo its cross sectional area is $0.02m^2$ and its turns 200 rotate with rate 6000 cycle in minute in magnetic field its density is 0.02T , so the effective value off electromotive force is ……

a) 35.53V
b) 25.12V
c) 17.76V
d) 12.56V

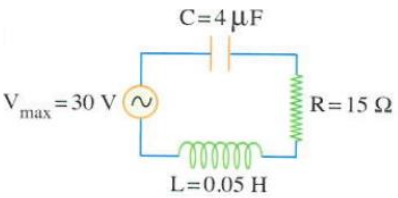
43. The opposite circuit becomes in a state of resonance when…….



a) $X_C = (X_L)_1 + (X_L)_2$ b) $X_C = \frac{(X_L)_1}{2} + \frac{(X_L)_2}{4}$

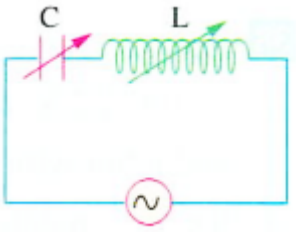
c) $X_C = \frac{(X_L)_1 . (X_L)_2}{(X_L)_1 + (X_L)_2}$ d) $X_C = (X_L)_1 = (X_L)_2$

44. The opposite circuit is in a state of resonance, then the consumed electric power from the source is .....



a)0 b) 2W c) 30 W d) 60 W

45. The figure shows a series tuning circuit that consists of variable capacitor and inductor with ohmic resistance. When the capacitance of the capacitor is increased to the double with keeping the same resonance frequency, then the ratio between the inductive reactance in first case to that in second case $\frac{X_{L1}}{X_{L2}}$ =.....



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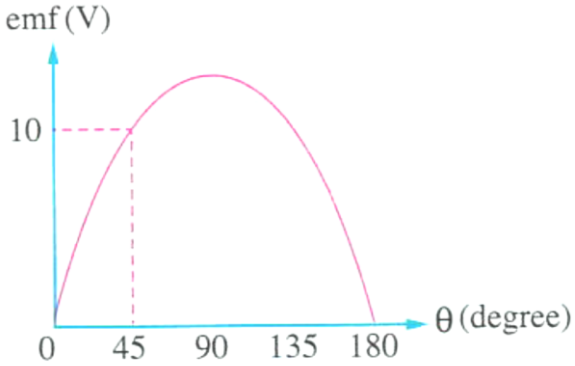
46. The opposite graph represents the change of the induced electromotive force (emf) in the dynamo's coil with respect to the angle between the normal to the coil's plane and the direction of the magnetic flux (θ), so the magnitude of the average induced emf in the dynamo's coil during 1/3 cycle from the starting of the coil's rotation equals…..



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