Training Models For third secondary

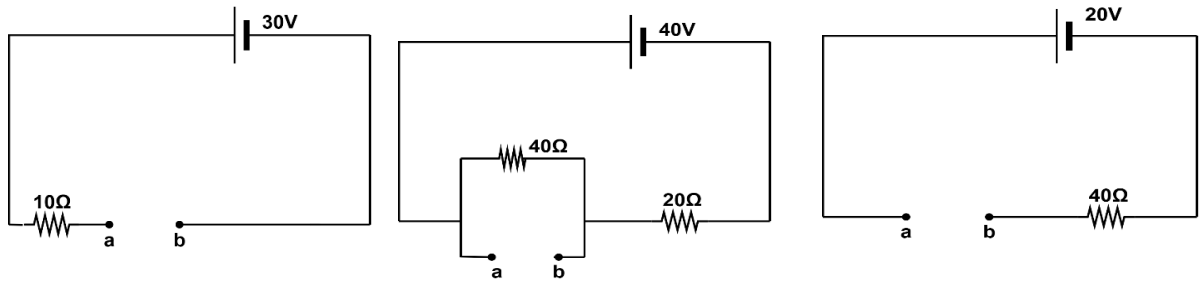
Physics

Model (8) - English

2025-2026

Part One: Objective questions (multiple choice) "each question has one Mark.

1. **In which of the following three circuits is the illumination of an electric lamp labeled (20 V, 10 W) greatest when placed between the two points a and b?**



(A) (B) (C)

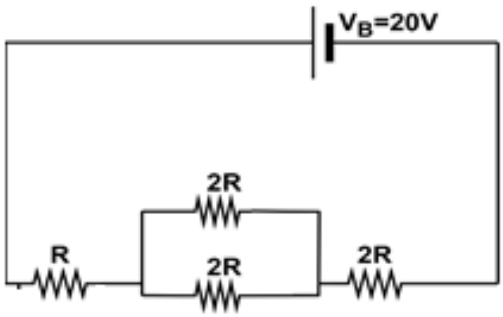
A	(A) only
B	(B) only
C	(C) only
D	(B) And (C)

2. **A uniform wire with a resistance of 9 Ω has been divided into three equal parts X, Y, and Z. Part (X) was stretched to double its length, part (Y) was reshaped to double its cross-sectional area, and part (Z) was kept as it was. Then, X and Z were connected together in parallel and with (Y) in series then to a battery of electromotive force 12.6 V.**

The current intensity in the circuit is .....

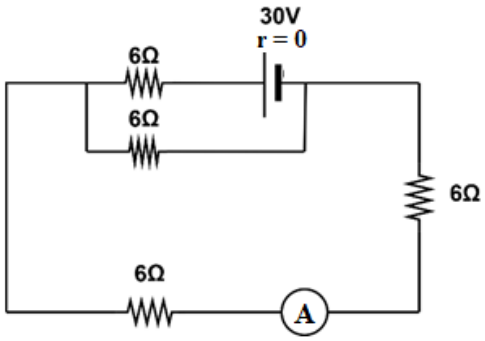
A	2.25 A
B	3.75 A
C	4 A
D	1.2 A

3. **The shown closed electric circuit. If the potential difference between the two ends of resistor R is 4V, So the choice <u>correctly</u> describes the electric cell in the circuit is .....**



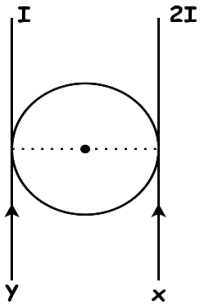
A	Its internal resistance is negligible.
B	Its internal resistance is equal to R.
C	Its internal resistance is equal to 2R.
D	Its internal resistance is equal to 4R.

4. **The figure represents a closed circuit with an electric cell of electromotive force 30 V of negligible internal resistance, so the ammeter reading is equal to.....**



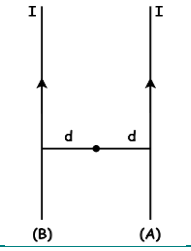
A	1 A
B	$\frac{1}{3}$ A
C	2 A
D	$\frac{2}{3}$ A

5. **The figure represents two straight parallel wires x and y through which electric currents 2I and I flow, respectively, and a circular coil tangent to them. If the resultant magnetic flux density due to the three currents at the center of the coil is zero, then the direction and magnitude of the magnetic flux density at the center of the coil resulting from the passing of current through the coil are..... , ...**



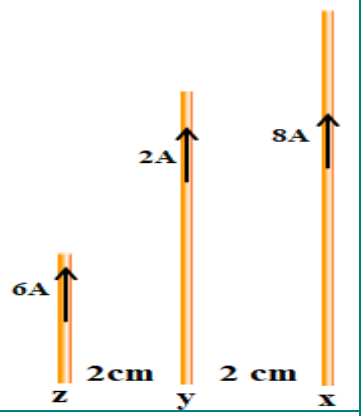
	The direction of the magnetic field	B_{coil} =.....
A	Perpendicular to the coil plane & inward	$B_x + B_y$
B	Perpendicular to the coil plane & inward	$B_x - B_y$
C	Perpendicular to the coil plane & outward	$B_x + B_y$
D	Perpendicular to the coil plane & outward	$B_x - B_y$

6. **The figure represents two long straight parallel wires A and B through which the same current intensity flows in the same direction, and the neutral point was at the midpoint between them. When the current in wire (B) increased to (3 I), the neutral point moved from its initial position a distance (X) that is equal to .....**



A	d
B	$\frac{1}{2}$ d
C	$\frac{1}{3}$ d
D	$\frac{1}{4}$ d

7.	**Which of the following does not affect the magnetic flux density at the center of the axis of a solenoid whose turns are tangent with each other?**	
	A	The number of turns of the coil
	B	The intensity of the current passing through the coil
	C	The magnetic permeability of the medium
	D	The diameter of the wire from which the coil is made

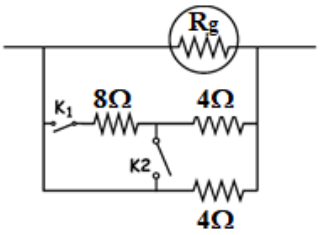
8.	**The figure shows three wires, x, y, and z, through which currents of 8 A, 2 A, and 6 A flow, respectively, and whose lengths are 4 m, 3 m, and 1 m, respectively. The net magnetic force acting on** wire **y is .....** 	
	A	1.2×10^{-4}N
	B	2.4×10^{-4} N
	C	4.8×10^{-4} N
	D	3.6×10^{-4} N

9.	**Two sensitive galvanometers, one newly manufactured and the other old and overused that has weakened spring coils. If an electric current of intensity 5 A passes through each of them, then .....**	
	A	Both read 5 A.
	B	Both are damaged.
	C	The newer one reads 5 A and the other reads 5.5 A.
	D	The newer one reads 5 A and the other reads 4.5 A.

10. **A moving coil galvanometer, whose scale is divided into 10 equal divisions, has a pointer that stabilizes at a deflection of (2/5) of the total scale. When the current through its coil is increased by 10 microamperes, the deflection of the pointer increases by (1/5) of the total scale. Therefore, the maximum current that the galvanometer can measure and its sensitivity are.....**

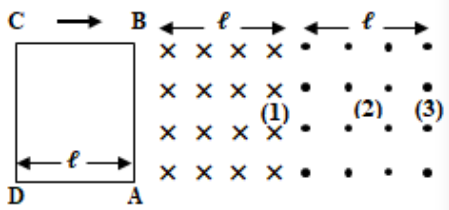
	The maximum current that the galvanometer can measure	Its sensitivity
A	20μA	5 div/μA
B	50μA	0.2 μA/div
C	20μA	5 μA/div
D	50μA	0.2 div/μA

11. **The figure represents a moving coil galvanometer that is converted into an ammeter. When only K_1 is closed, the sensitivity is reduced to one third, then when K_1 and K_2 are closed together, the sensitivity is reduced to.....**



A	$\frac{4}{7}$
B	$\frac{1}{4}$
C	$\frac{1}{12}$
D	$\frac{1}{13}$

12. **The figure represents a square metal frame moving in the direction shown, towards two uniform magnetic fields of equal magnetic flux density, one of them is perpendicular to the page inward and the other perpendicular to the page outward.**



The intensity of the induced current generated in the coil vanished when side AB reaches.....

A	(1) only
B	(2) only
C	(1) and (3) only
D	(1), (2), and (3)

13. **In the opposite figure: At the moment of the magnet's movement, the voltmeter reading increased, and the pole (Y) .....**

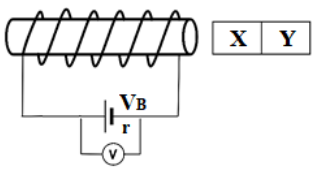
I- North and the magnet approaches the coil.

II- North and the magnet moves away from the coil.

III- South and the magnet approaches the coil.

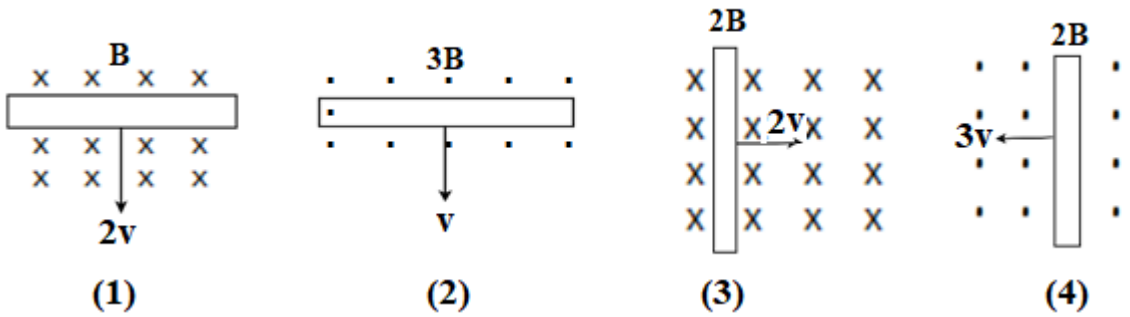
IV- South and the magnet moves away from the coil.

Which of the following <u>choices</u> are correct?



A	I and III
B	I and IV
C	II and III
D	II and IV

14. The figure represents a metallic rod of length (ℓ) moving in several different magnetic fields.



The <u>correct</u> order of the induced electromotive force (e.m.f.) generated between the two ends of the rod at the moment of movement is .....

A	$emf_1 > emf_4 > emf_2 > emf_3$
B	$emf_4 > emf_2 > emf_3 > emf_1$
C	$emf_4 > emf_3 > emf_2 > emf_1$
D	$emf_4 > emf_1 > emf_3 > emf_2$

15. Two adjacent coils have a mutual inductance coefficient M. If the number of turns in one coil doubles and the number of turns in the other coil triples, at constant other factors , the mutual inductance coefficient between the two coils becomes .....

A	2M
B	3M
C	5M
D	6M

16. An ideal electric transformer, the ratio between the number of turns of its coils is $\frac{20}{1}$ and the voltage across its primary coil is 30 V. So, the ratio between the voltage across the secondary coil when the transformer is a step-up voltage transformer (V_{s1}) and that when the transformer is a step-down voltage transformer (V_{s2}) $\left(\frac{(V_s)_1}{(V_s)_2}\right)$ is equal to.....

A	$\frac{600}{1}$
B	$\frac{3}{2}$
C	$\frac{300}{1}$
D	$\frac{400}{1}$

17. An alternating current dynamo rotates in a magnetic field of flux density 0.8 T around an axis parallel to its length. The coil's width is 10 cm and length of 20 cm, and it rotates at a linear speed of 4 m/s and consists of 100 turns.
The induced emf generated when the coil plane makes an angle of 60° with the magnetic field lines is.....

A	12.8 V
B	156.8 V
C	128 V
D	64 V

18. The ratio between the average emf during a quarter cycle and the average emf during $\frac{3}{4}$ cycle in the external circuit for a unidirectional current dynamo that started rotating from perpendicular position is equal to .....

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

19. Which of the following graphs shows the relationship between the amount of deflection of the hot wire ammeter's pointer on the scale and the intensity of the current passing through the iridium-platinum wire?

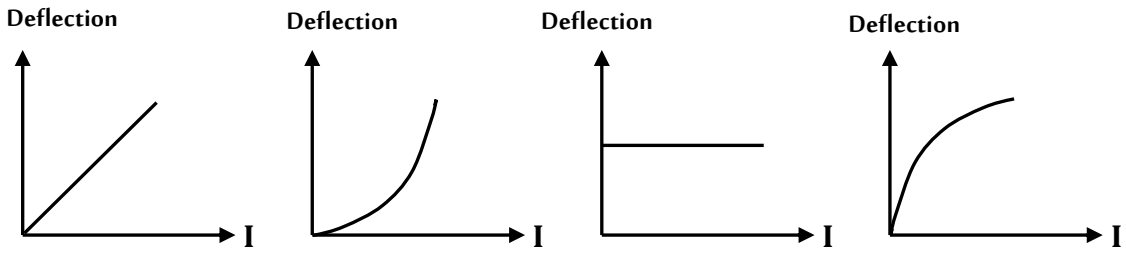
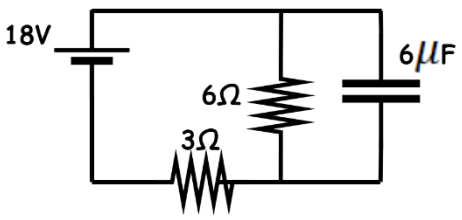


Figure (D) Figure (C) Figure (B) Figure (A)

A	Figure (A)
B	Figure (B)
C	Figure (C)
D	Figure (D)

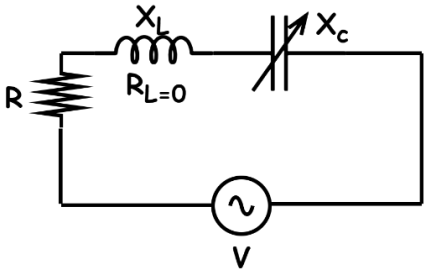
20. The figure represents an electric circuit with an electric cell with negligible internal resistance, two resistors, and a capacitor.

The charge accumulated on one of the two capacitor plates is equal to.....



A	Zero
B	36 μc
C	108 μc
D	72 μc

21. The circuit represents RLC alternating current circuit; its components are connected together in series. When $X_{c_1} = \frac{1}{2} X_L$, the passing current intensity at that case was I. If the capacitance of the capacitor gradually reduced until it became $X_{c_2} = \frac{3}{2} X_L$, so the current intensity in the circuit .....



A	decreases and does not reach zero
B	decreases until it reaches zero
C	increases until it reaches twice the initial value
D	increases to the maximum value, then decreases until it reaches the initial value

22. A photon of gamma rays of energy 6.625×10^5 eV incident on a free electron and scatters in a certain direction with an energy of 5×10^5 eV.

The decrease in the photon equivalent mass is equal to.....

A	$0.288 \times 10^{-30}\ kg$
B	0.288×10^{-28} kg
C	0.288×10^{-20} kg
D	0.2×10^{-30} kg

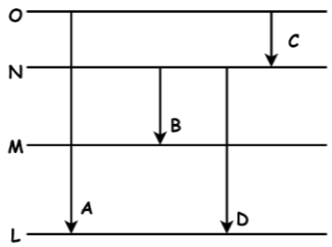
23. Two particles x and y, their masses m and 3m respectively, move with the same linear momentum. The ratio between the wavelengths associated with their motions $(\frac{\lambda_x}{\lambda_y})$ respectively, is .....

A	$\frac{1}{3}$
B	$\frac{3}{1}$
C	$\frac{1}{1}$
D	$\frac{1}{9}$

24. If you know that the frequency associated with the maximum radiation intensity of a glowing body with a temperature of 6000 K is equal to 6×10^{14} Hz, then the frequency associated with the maximum radiation intensity of a glowing body with a temperature of 4000 K is equal to .....

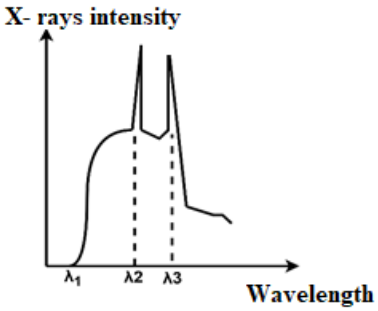
A	9×10^{14} Hz
B	1.44×10^{15} Hz
C	6×10^{14} Hz
D	4×10^{14} Hz

25. The diagram represents some transitions of the electron of hydrogen atom between the levels.
The transition(s) from which a photon is emitted in the visible light region is.....



A	C only
B	A and D together
C	B only
D	A only

26. From studying the X-rays spectrum shown in the figure,
if you know that: $\lambda_1 = 0.31$ Å, $\lambda_2 = 2$ Å,
then the energy difference resulting at λ_2 = ...
and the greatest potential difference = ...
If you know that:
$h = 6.625 \times 10^{-34}$ J.s
$c = 3 \times 10^{8}$ m.s^{-1}
$e = 1.6 \times 10^{-19}$ C



	The resulting energy difference at λ_2	The greatest potential difference
A	2×10^{-16} J	4×10^{4} V
B	6.4×10^{-15} J	6.2×10^{3} V
C	8.8×10^{-16} J	200 V
D	9.94×10^{-16} J	4×10^{4} V

27. The radiation intensity emitted from a laser source at a distance (d) from the source is e (I). So, at a distance (4d) from the source, the radiation intensity becomes.....

A	$\frac{I}{4}$
B	$\frac{I}{2}$
C	I
D	$\frac{I}{\sqrt{2}}$

28. If the ratio between the phase difference and the path difference of the reflected rays used in the holography is $\frac{1}{10^{-7}}$ m^{-1},
then the used wavelength is equal to .....

A	628.3 m
B	628.3 mm
C	628.3 nm
D	10^{-7} nm

29. **In a helium-neon laser, if the reflection coefficient of the semi-transparent mirror decreases, the intensity of the laser beam .....**

A	vanishes
B	decreases
C	increases
D	unchanged

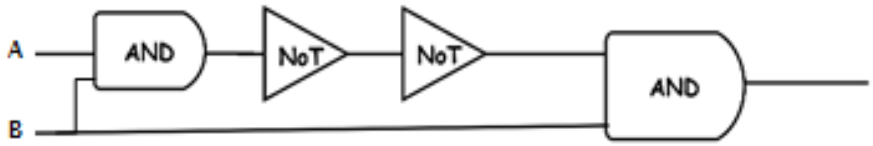
30. **A pure semiconductor has equal concentration from free electrons or holes equals 6×10^{8} m^{-3}. When it is doped by a certain impurities, the concentration of the free electrons is raised into 9×10^{12} m^{-3}, so the new concentration of holes becomes .....**

A	$4 \times 10^{5}\ m^{-3}$
B	$1.5 \times 10^{5}\ m^{-3}$
C	$1.5 \times 10^{4}\ m^{-3}$
D	$4 \times 10^{4}\ m^{-3}$

31. **The binary code that is equivalent to the decimal result of the mathematical operation $[40 + (1101)_2]$ is .....**

A	$(110101)_2$
B	$(110100)_2$
C	$(110011)_2$
D	$(101000)_2$

32. **Which of the following truth tables represents the set of logic gates shown?**



A

A	B	out
0	0	1
0	1	1

B

A	B	out
0	1	0
1	0	1

C

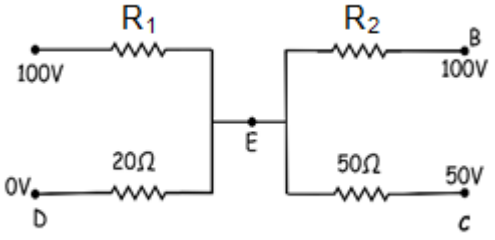
A	B	out
1	1	0
0	0	0

D

A	B	out
1	1	1
1	0	0

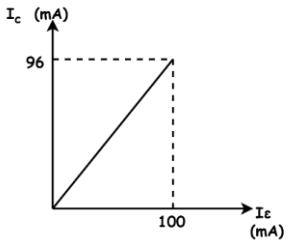
Second, Objective questions (multiple choice) "each question is two marks"

33. The figure represents a part of a closed electric circuit, if the ratio $\frac{R_1}{R_2} = \frac{1}{2}$ and the electric potential of point (E) = 20 V , so the value of the resistance of R_2 is equal to .....



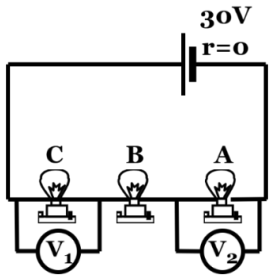
A	**600 Ω**
B	**450 Ω**
C	**300 Ω**
D	**150 Ω**

34. The opposite graph represents the relation between the emitter current and the collector current of an npn transistor (common emitter). From the graph, the values of βe and αe are, respectively, ...



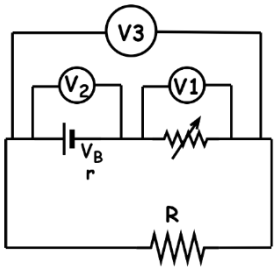
	β_e	α_e
A	24	0.96
B	32	0.49
C	48	0.96
D	64	0.49

35. **The electric circuit represents three identical lamps A, B, and C. If lamps A and C are damaged,**
the readings of V_1 and V_2 will be, respectively, ... , ...
(Note that the voltmeters are identical.)



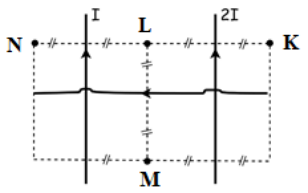
A	Zero , Zero
B	30 V ،30 V
C	15 V ،15 V
D	30 V , Zero

36. **In the circuit shown: When the value of the variable resistor increases, then.....**



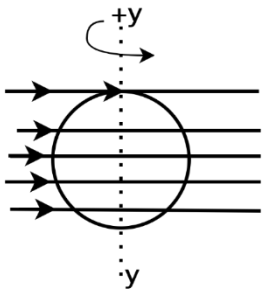
	The reading of V_1	**The reading of V_2**	**The reading of V_3**
A	increases	increases	increases
B	decreases	decreases	unchanged
C	decreases	decreases	increases
D	increases	increases	decreases

37. The opposite figure represents three very long wires , each carrying an electric current as shown in the figure.
The point at which the resultant magnetic flux density due to the three currents vanished (neutral point) is located at .....



A	Point (K)
B	Point (L)
C	Point (M)
D	Point (N)

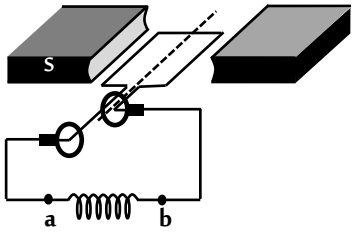
38. The figure shows a carrying- current circular coil produces magnetic flux density at its center 3×10^{-5} T and is placed where its plane is parallel to an external magnetic field of flux density 4×10^{-5} T. If the coil rotates around the axis of rotation 90^{o} in the direction shown once and in the opposite direction once more, the ratio between $(\frac{B_1}{B_2})$ is equal to.....



(Where B_1 is the resultant magnetic flux density at the center of the coil when it is rotated 90° in the direction shown and B_2 is the resultant magnetic flux density at the center of the coil when it is rotated 90° in the opposite direction.)

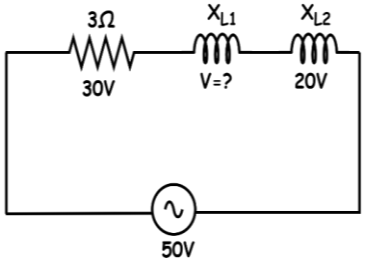
A	$\frac{1}{1}$
B	$\frac{1}{7}$
C	$\frac{5}{7}$
D	$\frac{7}{1}$

39 The figure represents an alternating current dynamo connected to a pure induction coil. At the moment of being the dynamo coil's plane is parallel to the flux lines during rotation,.....



	The potential difference between a,b is	The current intensity is
A	V_{eff}	I_{max}
B	V_{max}	Zero
C	V_{max}	I_{max}
D	Zero	Zero

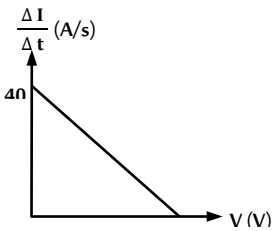
40. The figure shows an RL circuit connected to an AC power source. Using the data shown in the diagram, which of the following choices is correct?

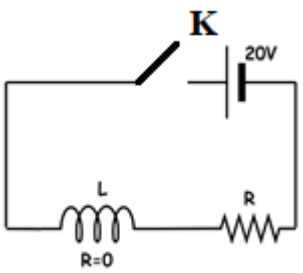


	The voltage across X_{L1}	The value of X_{L1}	The value of X_{L2}
A	20 V	20 Ω	**20 Ω**
B	10 V	1 Ω	**1 Ω**
C	20 V	2 Ω	**2 Ω**
D	Zero	**2 Ω**	**2 Ω**

41. **The graph shows the relation between the voltage across the resistor and the rate of current growth through the circuit at the moment of closing the switch.**

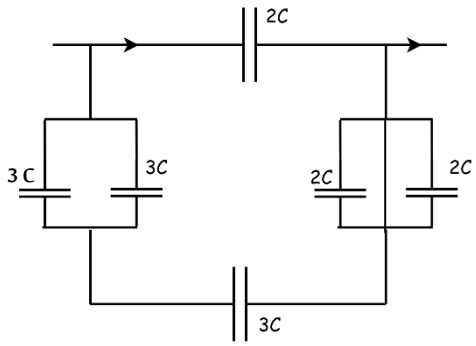
The voltage across the resistor when the rate of current growth is 10 A/s is equal to .....





A	25 V
B	20 V
C	15 V
D	10 V

42. **The equivalent capacitance of the circuit shown is .....**



A	1 C
B	4 C
C	8 C
D	5 C

43.	**An electron microscope is to be used to examine a particle. The wavelength of the wave accompanying the movement of the electron and required to examine this particle is 0.5449 Å. The potential difference between the anode and cathode must not be less than .....**
A	400 V
B	500 V
C	800 V
D	1000 V

44.	**X ray photon falls on a free electron losing 2% of its energy to the electron, so the wavelength of the scattered photon ..... of the original wavelength**
A	Increases by 2.4 %
B	Increases by 1.2 %
C	Increases by 2 %
D	Increases by 1.4 %

Third, Essay questions (each question two marks)

45	If you know that $\upsilon_1 = 2\upsilon_2 = \frac{1}{2}\upsilon_3$, when photoelectrons are emitted at using (υ_1) with kinetic energy equal to the work function of the metal. Calculate the kinetic energy of the photoelectrons emitted at using (υ_2) , (υ_3) in terms of the work function of the metal.

46	An ohmmeter of resistance (R) deflects its pointer to zero resistance scale when an electric current of 400 μA passes through its circuit. An external resistance (R_x) is connected to the two terminals of the ohmmeter, causing its pointer to deflect to $\frac{1}{8}$ of the current scale. Calculate the ratio $(\frac{R}{R_x})$.