

FIRST MID TERM TEST - JULY - 2019

THIRUNELVELI

STANDARD - XII
PHYSICS

DISTRICT

Time : 1 - 15 hours

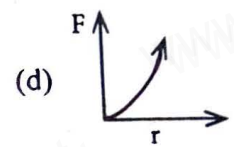
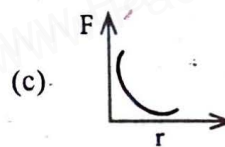
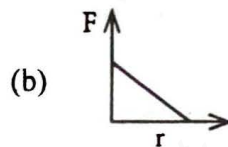
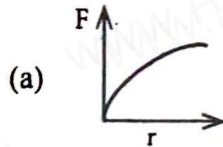
Marks - 35

PART - A

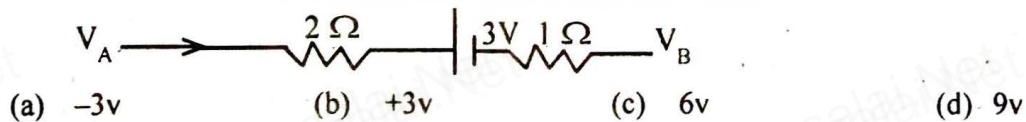
I. Choose the best answer:

 $10 \times 1 = 10$

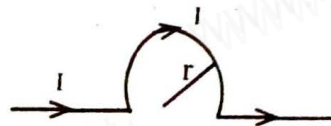
1. Force between two charges varies with distance between them as



2. Two charges $3 \times 10^{-8} \text{ C}$ and $-2 \times 10^{-8} \text{ C}$ located 15 cm apart. At what point on the line joining the two charges is the electric potential zero?
 (a) 9 cm (b) 45 cm (c) 18 cm (d) Both (a) and (b)
3. If voltage applied on a capacitor is increased from V to $2V$, choose the correct conclusion.
 (a) Q remains the same, C is doubled (b) Q is doubled C doubled
 (c) C remains the same, Q doubled (d) Both Q and C remain same
4. The drift velocity of free electrons in a conductor is V when a current I is flowing in it. If both the radius and current are doubled, then drift velocity will be
 (a) V (b) $\frac{V}{2}$ (c) $\frac{V}{4}$ (d) $\frac{V}{8}$
5. Two bulbs of 500 w and 300 w are manufactured to operate on 220 V line. If their resistances are R_1 and R_2 respectively, then value of $\frac{R_1}{R_2}$ is
 (a) $5/3$ (b) $3/5$ (c) $25/9$ (d) $9/25$
6. The potential difference ($V_A - V_B$) between the points A and B in the given figure is _____



7. The magnetic field at the centre O of the following current loop is



- (a) $\frac{\mu_0 I}{4r} \otimes$ (b) $\frac{\mu_0 I}{4r} \odot$ (c) $\frac{\mu_0 I}{2r} \otimes$ (d) $\frac{\mu_0 I}{2r} \odot$

8. The vertical component of Earth's magnetic field at a place is equal to the horizontal component. What is the value of angle of dip at this place?
 (a) 30° (b) 45° (c) 60° (d) 90°

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XII - PHYSICS

9. Water is _____.
 (a) dia magnetic (b) paramagnetic
 (c) ferromagnetic (d) none of these
10. The electric potential at a point in free space due to charge Q coulomb is $Q \times 10^{11}$ volts. The electric field at that point is _____.
 (a) $4\pi\epsilon_0 Q \times 10^{20}$ volt/m (b) $12\pi\epsilon_0 Q \times 10^{22}$ volt/m
 (c) $4\pi\epsilon_0 Q \times 10^{22}$ volt/m (d) $12\pi\epsilon_0 Q \times 10^{20}$ volt/m

PART - B

II. Answer ANY THREE of the following. Question No. 12 is compulsory: $3 \times 2 = 6$

11. The electric field lines never intersect. Justify.
 12. How many 160Ω resistor in parallel are required to carry a current of 5 A on a 100 V line?
 13. What are the uses of studying hysteresis loops of various material?
 14. A force of 40 N is acting between two charges in air if the space between them is filled with glass ($\epsilon_r = 8$), calculate the force between them.
 15. State Right hand thumb rule.

PART - C

III. Answer ANY THREE of the following. Question No. 18 is compulsory: $3 \times 3 = 9$

16. Obtain Gauss law from Coloumb's law.
 17. Explain. Peltier effect.
 18. A 3.0 m wire carrying a current of 10 A is placed inside a solenoid perpendicular to its axis. The magnetic field inside the solenoid is given to the 0.277 T. What is the magnetic force on the wire.
 19. Mention the properties of magnetic field lines?
 20. Show that energy stored in parallel plate capacitor is $\frac{1}{2} C V^2$.

PART - D

IV. Answer in detail: $2 \times 5 = 10$

21. Describe the microscopic model of current and obtain general form of ohm's law.

(OR)

Calculate the magnetic induction at a point on the axial line of a bar magnet.

22. Explain in detail the construction and working of a Vande Graff generator.

(OR)

Calculate the magnetic field inside and outside of the long solenoid using Ampere's circuital law.

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