XII-M1   6B

First Mid Term Test - 2019
Standard XII
PHYSICS

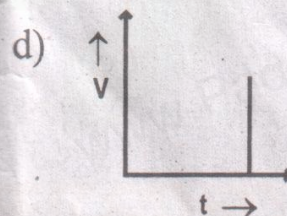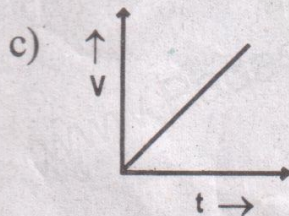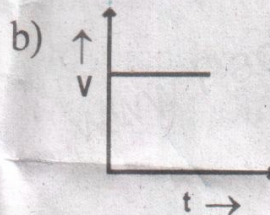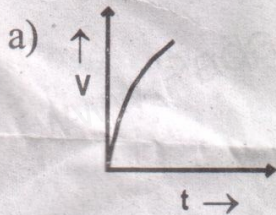Time: 1.30 hrs.   Marks: 35

PART - I

I. **Choose and write the correct answer:**   10x1=10

1. Two identical coins having similar charges are placed 4.5 m apart on a table. Force of repulsion between them is $\frac{40}{9}$ N. The value of charge on each coin is

    a) 100 μC   b) 200 μC   c) 300 μC   d) 400 μC

2. During charging a capacitor variation of potential V of the capacitor with time t is shown as

3. Which charge configuration produces a uniform electric field?
    a) point charge
    b) infinite uniform line charge
    c) uniformly charged infinite plane
    d) uniformly charged spherical shell

4. Three equal resistors connected in series across a source of emf together dissipate 10 W power. If the same resistors are connected in parallel across the same source, the power dissipated will be

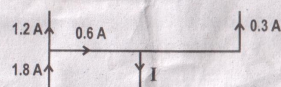   a) 90 W   b) $\frac{10}{3}$ W   c) 30 W   d) 10 W

5. In figure, the value of current I is

a) 1.5 A   b) 0.4 A   c) 0.9 A   d) 0.3 A

6. A carbon resistor of $(47 \pm 4.7)\,k\Omega$ to be marked with rings of different colours for its identification. The colour code sequence will be
   a) Yellow-Green - Violet - Gold
   b) Yellow - Violet - Orange - Silver
   c) Violet - Yellow - Orange - Silver
   d) Green - Orange - Violet - Gold

7. The internal resistance of a 2.1 V cell gives a current of 0.2 A through a resistance of $10\,\Omega$ is
   a) $0.2\,\Omega$ b) $0.5\,\Omega$ c) $0.8\,\Omega$ d) $1.0\,\Omega$

8. When the current flowing in a circular coil is doubled and the number of turns of the coil in it is halved, the magnetic field at its centre will become
   a) four times   b) same   c) half   d) double

9. Assertion (A) : Susceptibility is defined as the ratio of intensity of magnetisation I to magnetic intensity H.
   Reason (R)   : Greater the value of susceptibility smaller the value of intensity of magnetisation I.
   a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
   b) If both Assertion and Reason are true but the Reason is not the correct explanation of Assertion.
   c) If Assertion is true but Reason is false.
   d) If both Assertion and Reason are false.

10. A circular coil of radius 5 cm and 50 turns carries a current of 3 ampere. The magnetic dipole moment of the coil is
    a) $1.0\ amp-m^2$ b) $1.2\ amp-m^2$
    c) $0.5\ amp-m^2$ d) $0.8\ amp-m^2$

PART - II

II. **Answer any three questions. Q. No. 12 is compulsory:** 3x2=6

11. Define electrostatic potential.

12. The electric field lines never intersect. Justify.

13. Distinguish between drift velocity and mobility.

14. Resistance of a material at 10°C and 40°C are $45\,\Omega$ and $85\,\Omega$ respectively. Find its temperature coefficient of resistance.

15. State Maxwell's right hand cork screw rule.

PART - III

III. **Answer any three questions. Q. No. 19 is compulsory:** 3x3=9

16. What are the differences between Coulomb force and gravitational force?

17. Consider a point charge $+q$ placed at the origin and another point charge $-2q$ placed at a distance of 9m from the charge $+q$. Determine the point between the two charges at which electric potential is zero.

18. State the applications of Seebeck effect.

19. Two electric bulbs marked $20\,W - 220\,V$ and $100\,W - 220\,V$ are connected in series to 440 V supply. Which bulb will be fused?

20. State Biot-Savart's law.

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PART - IV

IV.   Answer all the questions: 2x5=10

21. a) Derive an expression for electrostatic potential due to an electric dipole.

(OR)

b) i) State Tangent law.

   ii) Compute the intensity of magnetisation of the bar magnet whose mass, magnetic moment and density are 200 g, $2\,Am^2$ and $8\,g\,cm^{-3}$ respectively.

22. a) Explain the determination of unknown resistance using meter bridge.

(OR)

b) i) Write a short note on electrostatic shielding.

   ii) A parallel plate capacitor has square plates of side 5 cm and separated by a distance of 1 mm (a) calculate the capacitance of this capacitor (b) If a 10 V battery is connected to the capacitor, what is the charge stored in any one of the plates?
   (The value of $\varepsilon_0 = 8.85 \times 10^{-12}\,Nm^2C^{-2}$)

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