KA   COMMON FIRST MID - TERM TEST - 2019

STANDARD - XII

PHYSICS

Time : 1.30 hours

Reg.No.☐☐☐☐☐☐

Marks: 35

SECTION - I

Choose the most suitable answer from the given four alternatives and write the option code and answer:

$7 \times 1 = 7$

1. Which charge configuration produce a uniform electric field?

   a) point charge   b) infinite uniform line charge

   c) uniformly charged infinite plane d) uniformly charged spherical shell

2. The 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 same, Q doubled   d) Both Q and C remain same

3. Two points A and B are maintained at a potential of 7v and -4v respectively. The work done in moving 50 electrons

   a) 8.80×10^{-17} J   b) -8.80×10^{-17} J   c) 4.40×10^{-17} J   d) 5.80×10^{-17} J.

4. What is the angle between electric field and equipotential surface?

   a) 90° always   b) 0° always   c) $0^\circ - 90^\circ$ d) $0^\circ - 180^\circ$

5. The resistance of a wire is 20Ω. What will be the new resistance if it is stretched uniformly two times its original length

   a) $10\ \Omega$ b) $20\ \Omega$ c) $40\ \Omega$ d) $80\ \Omega$

6. A toaster operating 240v has a resistance of 120Ω. The power is

   a) 400w   b) 2w   c) 480 w   d) 240 w

7. Which of the following I - V graph represents ohmic conductors?
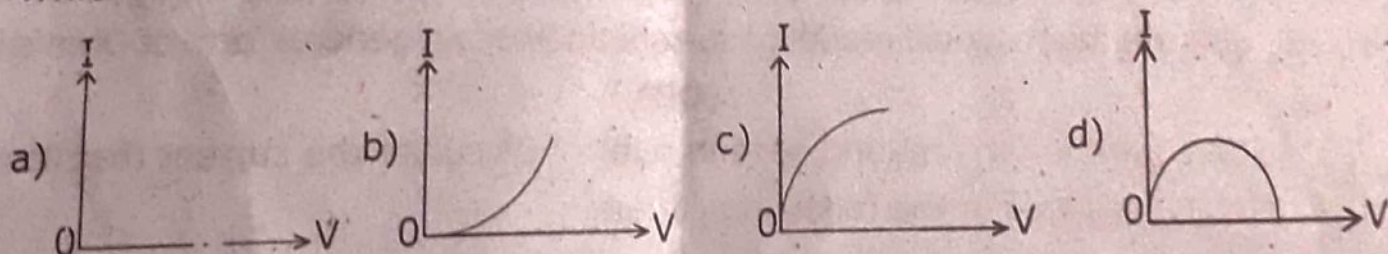
SECTION - II

Answer any three questions. Question No.10 is compulsory:

$3 \times 2 = 6$

8. Write down Coulomb's law in vector form and mention what each term represents.

9. Differentiate polar and non polar molecules.

10. 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 two charges at which electric potential is equal.

11. Define electrical resistivity. Give its unit.

12. Potential difference across 24Ω resistor is 12v. What is the current through the resistance.

SECTION - III

Answer any four questions. Question No.18 is compulsory: $4 \times 3 = 12$

13. Obtain the expression for energy stored in the parallel plate capacitor.

14. A water molecule has an electric dipole moment of 6.3×10^{-30} cm. A sample contains 10^{22} water molecules, with all the dipole moments aligned parallel to the external electric field of magnitude 3×10^5 NC^{-1}. How much work is required to rotate all the water molecules from $\theta = 0°$ to $90°$.

15. Give the properties of electric field lines.

16. Explain the equilvalent resistance of a series resistor network.

17. Explain the determination of the internal resistance of a cell using voltmeter.

18. What is the value of x when the Wheatstone's network is balanced?
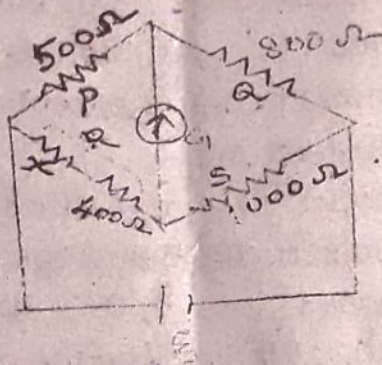
SECTION - IV

Answer all the questions in detail: $2 \times 5 = 10$

19. Calculate the electric field due to a dipole on its axial line.

(OR)

Obtain the expression for electric field due to an infinetly long charged wire.

20. Describe the microscopic model of current and obtain general form of Ohm's law.

(OR)

i) State Kirchoff's first and second rule. ii) Calculate the current that flows in the 1Ω resistor in the following circuit.