

Time 1.5 Hrs.

MM = 35

Note : Attempt all Questions.

SECTION – A (1 Mark)

- Q-1 Using Coulomb's Law of Electrostatics define unit of charge?
- Q-2 Find the number of electric-lines of forces originating from a charge of 1 Coulomb?
- Q-3 The current flowing through a conductor is 2 mA at 50 volt and 3 mA at 60 volt. Is it an ohmic or non-ohmic conductor ?
- Q-4 Define electric lines of forces, sketch electric – lines of force with location of Neutral- point for two equal positive charges separated by a distance of 10 cm.

SECTION – B (2 marks)

- Q-5 The sequence of coloured bands in two carbon – resistor R_1 and R_2 are
(a) Brown , Green and Blue (b) Orange , Black and Green
Find the ratio of their resistances.
- Q-6 A parallel combination of three resistors takes a current of 7.5 Amp from a 30 volt supply. If the two resistors are 10 ohm and 12 ohm. Find the value of third resistor ?
- Q-7 Define Equipotential Surface. A charge of +2 Coulomb is placed at the centre of a spherical shell of radius 10 cm, Calculate the work done for moving a charge of +1 micro coulomb on its surface through a distance of 5 cm ?
- Q-8 If the distance between two equal point charges is doubled and their individual charge are also doubled , what would happen to the Electrostatic- force between them ?

SECTION – C (3 Marks)

- Q-9 Define Electric dipole. Obtain Expression for electric field Intensity along equatorial line of an electric – dipole using labelled diagram.
- Q-10 The Electric field at a point due to a point charge is 30 N/C and Electric potential at that point is 15 J/C. Calculate the distance of the point from the charge and magnitude of the charge ?
- Q-11 Using Gauss's Theorem of Electrostatics, derive expression for Electric-field Intensity due to an infinitely long straight wire having uniform charge density.

P.T.O.

- Q12 Three Capacitors of $10\ \mu\text{F}$, $15\ \mu\text{F}$ and $30\ \mu\text{F}$ are connected in series and on this combination a potential difference of 60 volt is applied . Calculate Charge , potential difference and energy stored on each Capacitor ?
- Q-13 Derive Formula for the Capacitance of a Parallel Plate Capacitor. The capacitance of parallel plate capacitor is 8 Farad , what will be the new Capacitance if the distance between the plates be reduced by half and area of plates be doubled ?
- Q-14 Charges $+15\ \mu\text{C}$, $+10\ \mu\text{C}$ and $-10\ \mu\text{C}$ are placed in air at the corners A, B and C of an equilateral triangle ABC respectively , having each side equal to 5 cm. Determine the magnitude of the resultant coulombic-force on the charge placed at corner A .

SECTION – D (5 mark)

- Q-15 (a) State Kirchhoff's Laws for Electrical circuit.
- (b) Using these Laws Obtain the condition for Balanced Wheat –stone Bridge circuit.
