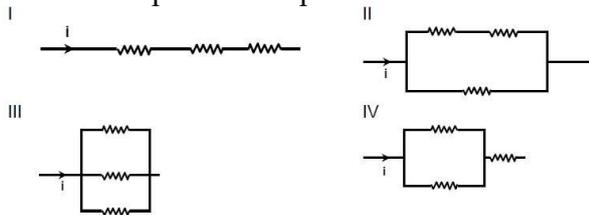


PHYSICS

**ELECTRIC CHARGES AND FIELDS,
ELECTRIC POTENTIAL AND
CAPACITORS AND CURRENT
ELECTRICITY**

101. The three resistances of equal value are arranged in the different combinations shown below. Arrange them in increasing order of power dissipation

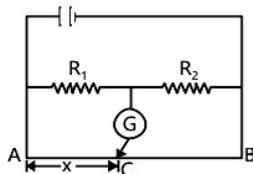


- (1) III < II < IV < I
- (2) II < III < IV < I
- (3) I < IV < III < II
- (4) I < III < II < IV

102. In a potentiometer experiment, it is found that no current passes through the galvanometer when the terminals of the cell are connected across 52 cm of the potentiometer wire. If the cell is shunted by a resistance of 5 Ω, a balance is found when the cell is connected across 40 cm of the wire. Find the internal resistance of the cell.

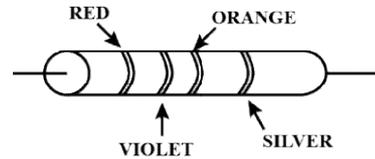
- (1) 1 Ω
- (2) 2 Ω
- (3) 1.5 Ω
- (4) 2.5 Ω

103. In the shown arrangement of the experiment of the meter bridge if AC corresponding to null deflection of galvanometer is x, what would be its value if the radius of the wire AB is doubled?



- (1) x
- (2) $\frac{x}{4}$
- (3) 4x
- (4) 2x

104. A resistance is shown in the figure. Its value and tolerance are given respectively by

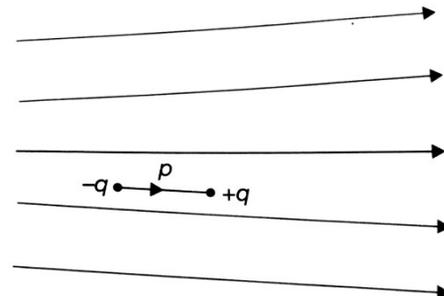


- (1) 270 Ω, 5%
- (2) 27 kΩ, 20%
- (3) 27 kΩ, 10%
- (4) 270 kΩ, 10%

105. Which of the following statements is false?

- (1) In a balanced Wheatstone bridge, if the cell and the galvanometer are exchanged, the null point is disturbed
- (2) Mobility depends on electric field
- (3) Kirchoff's second law represents energy conservation
- (4) Wheatstone bridge is the most sensitive when all the four resistances are of the same order of magnitude

106. Figure shows electric field lines in which an electric dipole p is placed as shown. Which of the following statements is correct?

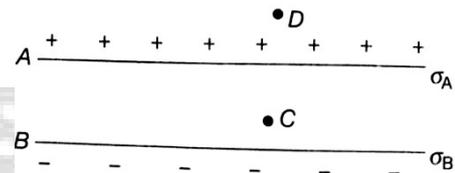


- (1) The dipole will not experience any force
- (2) The dipole will experience a force towards right

- (3) The dipole will experience a force towards left
 (4) The dipole will experience a force upwards
107. Two charges are placed as shown in figure. Where should be a third charge be placed so that it remains in rest condition?
- (1) 30 cm from $9e$
 (2) 40 cm from $16e$
 (3) 40 cm from $9e$
 (4) (1) or (2)
108. Two charges are at distance (4) apart in air. Coulomb force between them is F . If a dielectric material of dielectric constant (K) is placed between them, the Coulomb force now becomes

- (1) $\frac{F}{K}$ (2) FK
 (3) $\frac{F}{K^2}$ (4) K^2F

109. Two small balls having equal positive charge Q (Coulomb) on each are suspended by two insulating strings of equal length L m, from a hook fixed to a stand. The whole set up is taken in a satellite in to space where there is no gravity (state of weightlessness), then the angle (θ) between the two strings is
- (1) 0°
 (2) 90°
 (3) 180°
 (4) $0^\circ < \theta < 180^\circ$
110. Two parallel plates of infinite dimensions are uniformly charged. The surface charge density on one is σ_A , while on the other is σ_B , field intensity at point C will be



- (1) Proportional to $(\sigma_A - \sigma_B)$
 (2) Proportional to $(\sigma_A + \sigma_B)$
 (3) Zero
 (4) $2\sigma_A$