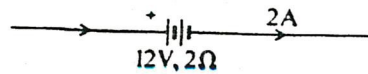
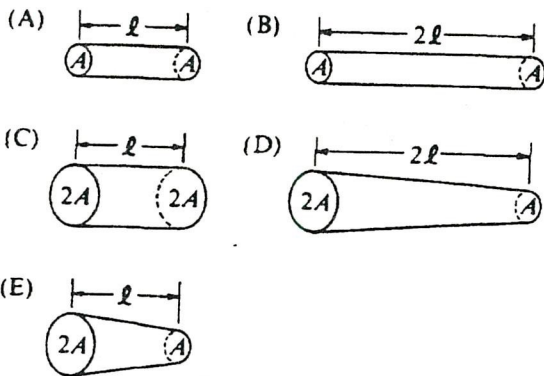


43. Points R and S are each the same distance d from two unequal charges, $+Q$ and $+2Q$, as shown above. The work required to move a charge $-Q$ from point R to point S is
- (A) dependent on the path taken from R to S
 (B) directly proportional to the distance between R and S
 (C) positive
 (D) zero
 (E) negative
44. The five resistors shown below have the lengths and cross-sectional areas indicated and are made of material with the same resistivity. Which has the greatest resistance?



45. A 12-volt storage battery, with an internal resistance of 2Ω , is being charged by a current of 2 amperes as shown in the diagram above. Under these circumstances, a voltmeter connected across the terminals of the battery will read
- (A) 4 V (B) 8 V (C) 10 V
 (D) 12 V (E) 16 V
46. A galvanometer has a resistance of 99 ohms and deflects full scale when a current of 10^{-3} ampere passes through it. In order to convert this galvanometer into an ammeter with a full-scale deflection of 0.1 ampere, one should connect a resistance of
- (A) 1Ω in series with it
 (B) 901Ω in series with it
 (C) $9,900\Omega$ in series with it
 (D) 1Ω in parallel with it
 (E) $9,900\Omega$ in parallel with it
47. Two long, parallel wires, fixed in space, carry currents I_1 and I_2 . The force of attraction has magnitude F . What currents will give an attractive force of magnitude $4F$?
- (A) $2I_1$ and $\frac{1}{2}I_2$
 (B) I_1 and $\frac{1}{4}I_2$
 (C) $\frac{1}{2}I_1$ and $\frac{1}{2}I_2$
 (D) $2I_1$ and $2I_2$
 (E) $4I_1$ and $4I_2$