No. 37

A distribution of charge is confined to a finite region of space. The difference in electric potential between any two points P_1 and P_2 due to this charge distribution depends only upon the

(A) charges located at the points P_1 and P_2

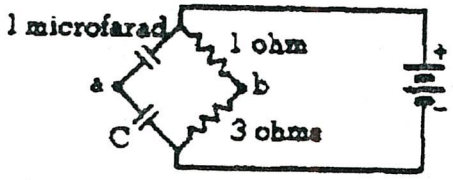
(B) magnitude of a test charge moved from P_1 to P_2

(C) value of the electric field at P_1 and P2

(D) path taken by a test charge moved from P_1 to P_2

(E) value of the integral $-\int_{P_1}^{P_2} E \bullet dr$

No. 38



In the circuit shown above, the potential difference between points a and b is zero for a value of capacitance C of

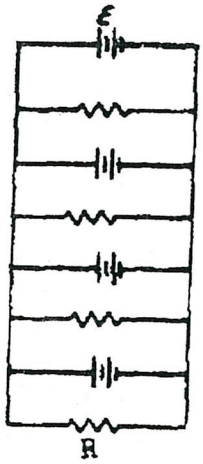
(A) 1/3 microfarad
(B) 2/3 microfarad
(C) 2 microfarads
(D) 3 microfarads
(E) 9 microfarads

No. 39

In a 30 minute interval, one kilowatt-hour of electrical energy is dissipated in a resistance of 20 ohms by a current of

(A) 10 A (B) 14.1 A (C) 18 A
(D) 20 A (E) 36 A

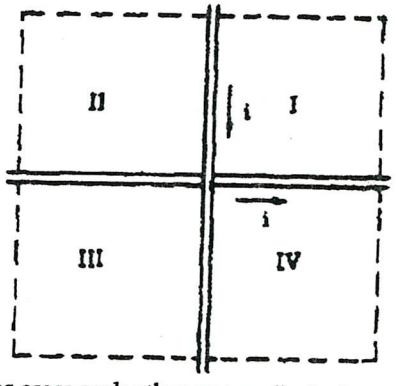
No. 40



In the circuit above, all batteries are identical with emf ε and all resistances are equal to R. The total power dissipated is

(A) $\varepsilon^2/4R$
(B) ε^2/R
(C) $2\varepsilon^2/R$
(D) $16\varepsilon^2/R$
(E) None of the above

No. 41



Two wires cross each other perpendicularly so they do not actually touch but are close to each other, as shown above. Identical currents I exist in each wire in the directions indicated. There will be some points of zero magnetic field B in

(A) region I only
(B) region II only
(C) regions I and III only
(D) regions I and IV only
(E) regions II and IV only