b

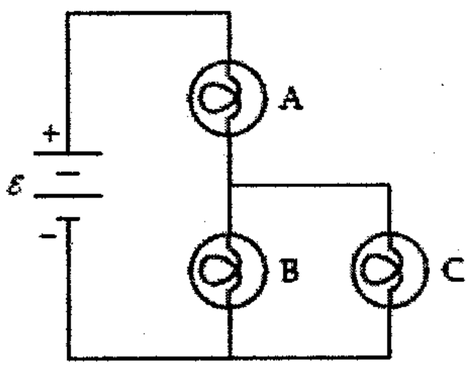
16. A fully charged capacitor acts like
a) a resistanceless wire (short ciruit) (b) an infinite resistance (open circuit)

17. In a loop in a closed circuit, the sum of the currents entering a junction equals the sum of the currents leaving a junction because
a. the potential of the nearest battery is the potential at the junction.
b. there are no transformations of energy from one type to another in a circuit loop.
c. capacitors tend to maintain current through them at a constant value.
d. current is used up after it leaves a junction.
e. charge is neither created nor destroyed at a junction.

e

18. The circuit below contains three 100 watt light bulbs. The emf $\varepsilon = 110$ V. Which light bulb(s) is(are) the brightest?

a



Full battery current passes through A, so P_A is greatest.

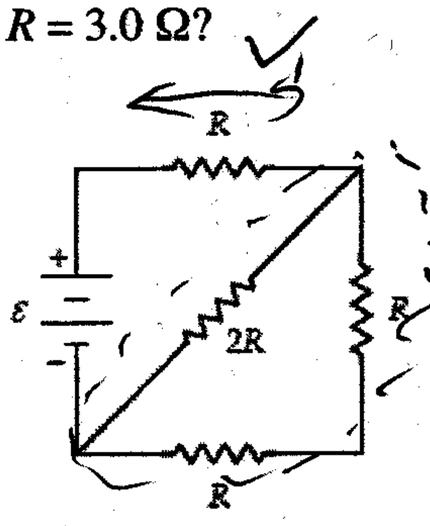
(a) A
b. B
c. C
d. B and C
e. All three are equally bright.

d

19. A voltmeter
a) should be connected in series and have a small internal resistance
b) should be connected in parallel and have a small internal resistance
c) should be connected in series and have a large internal resistance
(d) should be connected in parallel and have a large internal resistance

20. At what rate is thermal energy being generated in the $2R$-resistor when $\varepsilon = 12$ V and $R = 3.0\ \Omega$?

C



$R_{eq,1}$

$$\frac{1}{R_{eq,1}} = \left(\frac{1}{2R} + \frac{1}{R+R}\right)^{-1}$$

$$R_{eq,1} = R$$

$$R_{eq} = R + R = 2R$$

$$I = \frac{\mathcal{E}}{R_{eq}} = \frac{\mathcal{E}}{2R} = \frac{12V}{6\Omega} = 2.0A$$

$$V_{2R} = \mathcal{E} - V_1 = 12V - (2.0A)(3.0\Omega)$$
$$= 6V$$

$$P_{2R} = \frac{V_{2R}^2}{2R} = \frac{(6V)^2}{6.0\Omega} = 6W$$

a. 12 W
b. 24 W
(c) 6.0 W
d. 3.0 W
e. 1.5 W