Unit 22 - Homework Solution

26 - 19

$\Delta V = 120\ V$

$R = 14\ \Omega$

a) $P = \frac{(\Delta V)^2}{R} = \frac{120^2}{14} = 1029\ J/s = 1029\ W$

b) $Energy = P\Delta t = (1029\ W)(5\ h) = (1.029\ kW)(5\ h)$

$= 5.145\ kW.h$

$Cost = (5.145\ kW.h)(5.0\ ¢/kW.h)$

$= 26\ ¢$

26 - 26

$P = 100\ W$

$\Delta V = 120\ V$

a) $E = P\Delta t = (100\ W)(30 \times 24\ h) = 72\ kW.h$

$Cost = (12\ ¢/kW.h)(72\ kW.h) = 864\ ¢$

b) $P = (\Delta V)^2/R \Rightarrow R = \frac{(\Delta V)^2}{P} = \frac{120^2}{100} = 144\ \Omega$

c) $P = (\Delta V)I \Rightarrow I = \frac{P}{\Delta V} = \frac{100}{120} = 0.83\ A$

d) Yes, resistance of the bulb depends on the current passing through it.