

Ch 1 (31, 33, 35, 39, 42, 43)

1-31

GIVEN

$6.24 \times 10^{18} e^-$  pass thru wire in 1 sec

REQD

#  $e^-$  pass thru in 2 hrs, 47 min, 10 sec

SOLN

$$2 \text{ hrs} \rightarrow N = \frac{6.24 \times 10^{18} e^-}{1 \text{ sec}} \left| \frac{3600 \text{ sec}}{\text{hr}} \right| \frac{2 \text{ hr}}{1} = 4.49 \times 10^{22} e^-$$

$$47 \text{ min} \rightarrow N = \frac{6.24 \times 10^{18} e^-}{1 \text{ sec}} \left| \frac{60 \text{ sec}}{\text{min}} \right| \frac{47 \text{ min}}{1} = 1.76 \times 10^{22} e^-$$

$$10 \text{ sec} \rightarrow N = \frac{6.24 \times 10^{18} e^-}{1 \text{ sec}} \left| \frac{10 \text{ sec}}{1} \right| = 6.24 \times 10^{19} e^-$$

$$\boxed{6.26 \times 10^{22} e^-}$$

1-33

REQD: TIME FOR LIGHT TO TRAVEL  $3.47 \times 10^5$  km in vacuum

SOLN:  $c = 3 \times 10^8$  m/sec

$$T = \frac{D}{V} = \frac{3.47 \times 10^5 \text{ km}}{3 \times 10^8 \text{ m}} \left| \frac{1000 \text{ m}}{\text{km}} \right| \frac{\text{sec}}{1} = \boxed{1.16 \text{ sec}}$$

1-35

GIVEN:  $\dot{V} = 3.73 \times 10^4$  m<sup>3</sup>/s

REQD Flow in L/hr

SOLN:

$$\dot{V} = \frac{3.73 \times 10^4 \text{ m}^3}{\text{sec}} \left| \frac{3600 \text{ sec}}{\text{hr}} \right| \frac{1 \text{ L}}{1 \times 10^{-3} \text{ m}^3} = \boxed{1.34 \times 10^{11} \text{ L/hr}}$$

1-39REQD: EXPRESS IN PROPER PREFIXSOLN:

$$a. \quad 0.0015 \text{ sec} = 1.5 \times 10^{-3} \text{ sec} = \boxed{1.5 \text{ msec}}$$

$$b. \quad 0.000027 \text{ sec} = 27 \times 10^{-6} \text{ sec} = \boxed{27 \text{ usec}}$$

$$c. \quad 0.00035 \text{ ms} = 0.35 \text{ usec} = \boxed{350 \text{ nsec}}$$

1-42REQD: EXPRESS IN STATED UNITS.SOLN:

$$a. \quad 700 \text{ } \mu\text{A} - 0.4 \text{ mA} = 700 \text{ } \mu\text{A} - 400 \text{ } \mu\text{A} = \boxed{300 \text{ } \mu\text{A} = 0.3 \text{ mA}}$$

$$b. \quad 600 \text{ MW} + 300 \times 10^4 \text{ W} = 600 \text{ MW} + 3 \text{ MW} = \boxed{603 \text{ MW}}$$

1-43REQD: CHANGE PREFIXSOLN:

$$a. \quad 330 \text{ V} + 0.15 \text{ kV} + 0.2 \times 10^3 \text{ V} = 330 \text{ V} + 150 \text{ V} + 200 \text{ V} = \boxed{680 \text{ V}}$$

$$b. \quad 60 \text{ W} + 100 \text{ W} + 2700 \text{ mW} = 60 \text{ W} + 100 \text{ W} + 2.7 \text{ W} = \boxed{162.7 \text{ W}}$$