

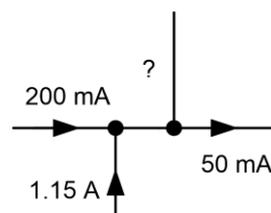
# ELECTRONIC CIRCUITS

FUNDAMENTALS AND APPLICATIONS

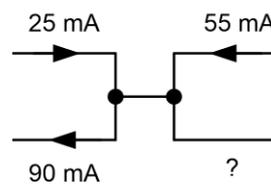
## QUESTION SET A

Target time: 60 minutes

1. A  $1.2\text{ k}\Omega$  resistor is connected to a DC supply of  $180\text{ V}$ . Determine the current flowing and the power dissipated in the resistor. How much energy will be supplied to the resistor if it is left connected to the supply for 50 minutes?
2. Determine the missing currents in Figure 1.



(a)



(b)

Figure 1 See Question 2

3. An electrical conductor has a resistance of  $0.02\ \Omega$  per metre and a length of  $75\text{ m}$ . Determine the voltage drop across the ends of the conductor when a current of  $2.5\text{ A}$ . What power will be dissipated in the conductor?
4. Resistors of  $150\ \Omega$  are available. Sketch circuits showing how three of these resistors can be connected to produce resistances of (a)  $50\ \Omega$ ; (b)  $225\ \Omega$ ; and (c)  $450\ \Omega$ .
5. A capacitor of  $680\ \mu\text{F}$  is charged to a potential of  $200\text{ V}$ . Determine the amount of charge and energy stored in the capacitor.

6. A sinusoidal AC supply has a frequency of 60 Hz and an r.m.s. value of 110 V. Determine the periodic time and peak value of the supply.

7. Determine the reactance at 400 Hz of (a) a 60 mH inductor; and (b) a 220 nF capacitor.

8. The characteristics of a silicon junction diode are shown in Figure 2. Determine:

(a) the forward current when the forward voltage is 0.6 V;

(b) the equivalent resistance of the diode when the forward current is 16 mA.

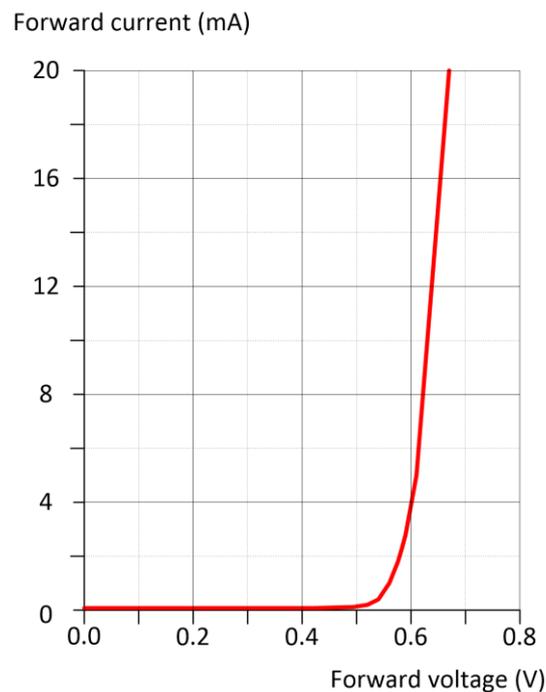


Figure 2 See Question 8

9. A transformer has 440 primary turns and 40 secondary turns. The primary is connected to a 220 V a.c. supply and the secondary is connected to a load resistance of 4  $\Omega$ . If the transformer is 'loss free' determine: (a) the secondary voltage; (b) the secondary current; and (c) the primary current.

10. A moving coil meter has a full-scale deflection current of 2 mA and a coil resistance of 1.5 k $\Omega$ . Determine:

(a) the value of shunt resistor if the meter is to be used as an ammeter reading 0 to 10 mA;

(b) the value of series (multiplier) resistor if the meter is to be used as a voltmeter reading 0 to 10 V.