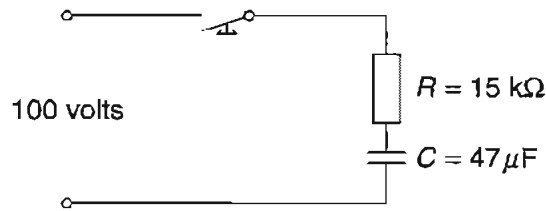


Question 20 (5 marks)

An electrical circuit is shown.



Calculate, showing all working:

- (a) the time constant for the circuit;

2

~~$$T = RC$$
$$= 15 \times 47$$
$$= 705 \text{ } \hat{=} 60$$
$$= 11.75 \text{ sec}$$~~

$$T = RC$$
$$= 1500 \times 470.000$$
$$= 0.705$$
$$= 0.01175 \text{ sec}$$

- (b) the maximum circuit current;

1

$$I = \frac{V}{R}$$
$$= \frac{100}{1500} = 0.06 \text{ A}$$

- (c) the value of resistance to be added to change the time constant to one second.

2

$$R = \frac{T}{C}$$
$$= \frac{1}{47 \text{ E}^{-6}}$$
$$= 1 \text{ M}\Omega$$