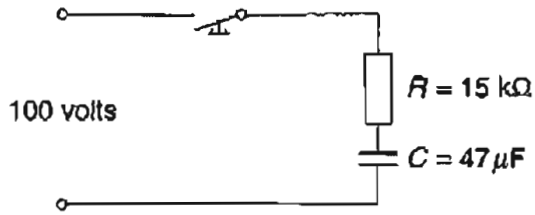
Question 20 (5 marks)

An electrical circuit is shown.



Calculate, showing all working:

(a) the time constant for the circuit; **2**

$T = RC$

$= 15 \times 10^{3} \times 47 \times 10^{-6}$

$= 15000 \times$ 0.705 seconds

(b) the maximum circuit current; **1**

$I = 100/15000$

$= 6.7 \times 10^{-3}$ (1.d.p)

(c) the value of resistance to be added to change the time constant to one second. **2**

22000 − 15000

= 7000 Ω needs to be added to reach one second