



**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

**FINAL EXAMINATION  
(TAKE HOME)  
SEMESTER II  
SESSION 2019/2020**

COURSE NAME : ELECTRIC CIRCUIT  
COURSE CODE : BEL 10103  
PROGRAMME CODE : BEJ  
EXAMINATION DATE : JULY 2020  
DURATION : 3 HOURS  
INSTRUCTION : ANSWERS ALL QUESTIONS  
OPEN BOOK EXAMINATION

THIS QUESTION PAPER CONSISTS OF **FOUR (4)** PAGES

- Q1** A wiring circuit for a special lamp in a home is shown in **Figure Q1**. The lamp has resistance of  $2\Omega$  and the designer selects  $R=100\Omega$ . The lamp will light up when  $I > 50\text{mA}$  but will burn out when  $I > 75\text{mA}$ . Determine the current in the lamp and identify if either it will light up when  $R=100\Omega$ .

(8 marks)

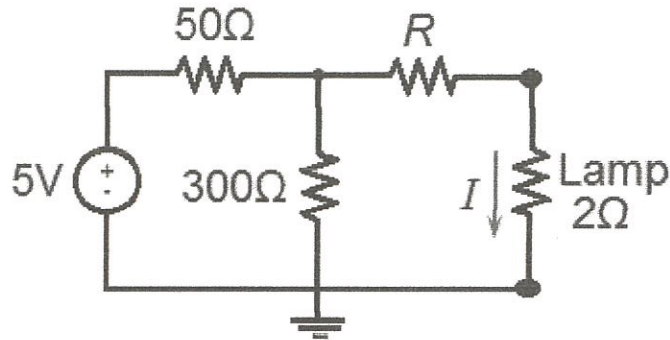


Figure Q1

- Q2** **Figure Q2** shows a measurement made in the laboratory. Your lab partner forgot to record the values of  $V_1$  and  $V_2$ . By using either nodal analysis or mesh analysis method, find the values of  $V_1$  and  $V_2$ . Justify the reason of choosing the method :

(10 marks)

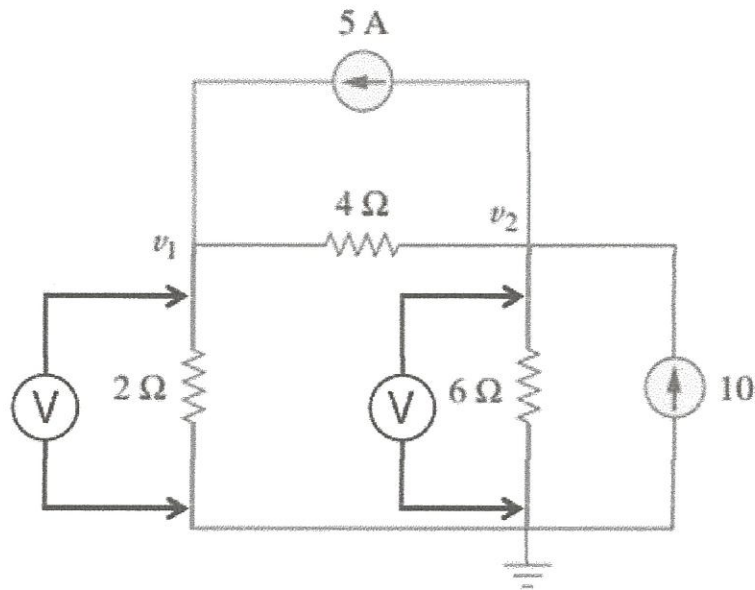


Figure Q2

**Q3** Figure Q3 shows a circuit is connected to load resistance  $R_L$  such that maximum possible power delivered to the load. Calculate the value of the load resistance  $R_L$  that will results in maximum power delivered to the load. Determine the maximum power delivered to the load resistance  $R_L$  and the current,  $I$  flow through  $R_L$ .

(14 marks)

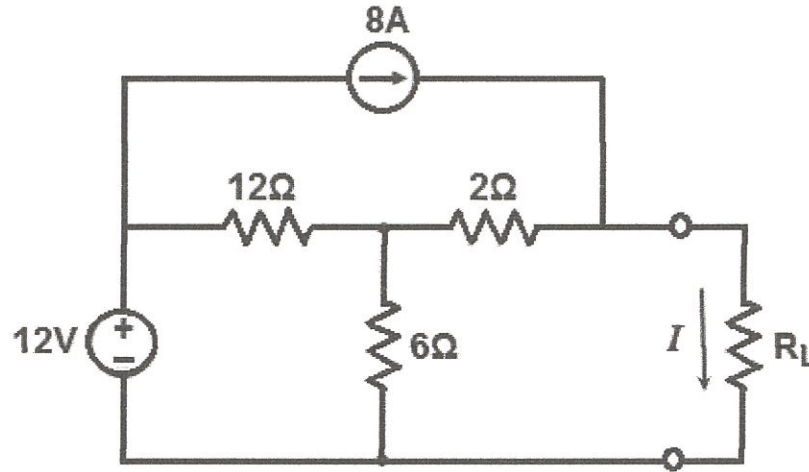


Figure Q3

**Q4** The periodic current  $i_s(t)$  as shown in Figure Q4(a) is fed to the circuit in Figure Q4(b).

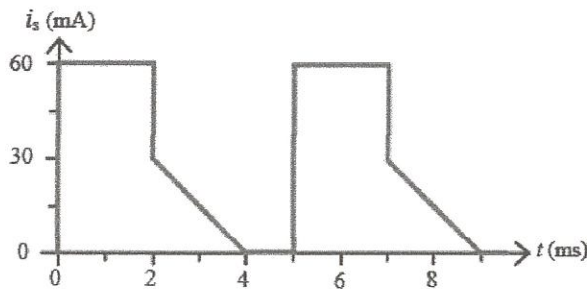


Figure Q4(a)

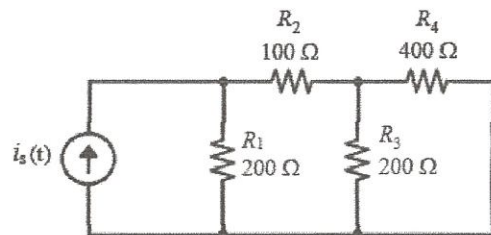


Figure Q4(b)

(a) Calculate the average and the effective current  $i_s(t)$  as indicated in Figure Q4(a).

(7 marks)

(b) Based on the answer in Q4(a)-, determine the effective current flows through  $R_3$ .

(4 marks)

- (c) Calculate the average power absorbed by  $R_3$ . (2 marks)
- (d) If the input current is replaced with the sinusoidal wave having a peak-to-peak value of 160 mA and frequency of 1 kHz, calculate the new average power absorbed by  $R_3$ . (5 marks)

**-END OF QUESTIONS-**