



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2018/2019**

COURSE NAME : ELECTRICAL & ELECTRONIC TECHNOLOGY

COURSE CODE : BDU10803

PROGRAMME : BDC/BDM

EXAMINATION DATE : JUNE/JULY 2019

DURATION : 3 HOURS

INSTRUCTION : ANSWER ALL QUESTIONS

THIS QUESTION PAPER CONSISTS OF SIX (6) PAGES

- Q1**
- (a) State the function of inductor and the SI unit of inductance. (3 marks)
 - (b) Find L_{eq} at the terminal a-b of the circuit in **Figure Q1(b)**. (5 marks)
 - (c) For the circuit in **Figure Q1(c)**, calculate the value of R that will make the energy stored in the capacitor the same as that stored in the inductor under dc conditions. (7 marks)
 - (d) Determine the currents and voltages shown in **Figure Q1(d)** using Kirchoff's Law. (10 marks)
- Q2**
- (a) (i) Describe the differences between nodal analysis and mesh analysis. (2 marks)
 - (ii) Determine the voltages at the nodes in **Figure Q2 (a)(ii)** using nodal analysis. (9 marks)
 - (b) By applying superposition theorem, find v for the circuit given in **Figure Q2(b)**. (4 marks)
 - (c) Consider the circuit in **Figure Q2(c)** and calculate;
 - (i) Thevenin resistance, R_{Th} , (2 marks)
 - (ii) Thevenin voltage, V_{Th} , (5 marks)
 - (iii) value of R_L for maximum power transfer, (1 mark)
 - (iv) maximum power, P_{max} . (2 mark)
- Q3**
- (a) Apply DeMorgan's theorem to each of the following expressions:
 - (i) $\overline{(A + B + C)D}$ (4 marks)

(ii) $\overline{AB + CD + EF}$ (4 marks)

(b) Referring to the logic diagram in **Figure Q3(b)**;

(i) Write Boolean expression; (3 marks)

(ii) Develop a truth table from the Boolean expression in Q3(b)(i). (4 marks)

(c) As part of an aircraft's functional monitoring system, a circuit is required to indicate the status of the landing gears prior to landing. A green LED display turns ON if all three gears are properly extended. A red LED display turns on if any of the gears fail to extend. Implement a control circuit to meet this requirement as shown in **Figure Q3(c)**. (10 marks)

Q4 (a) Draw all types of magnetic circuits with their equivalent electric circuit. (5 marks)

(b) A coils of 200 turns is wound uniformly over a wooden ring having a mean circumference of 600 mm and a uniform cross sectional area of 500 mm². If the current through the coil is 4 A, calculate:

(i) the magnetic field strength, (2 marks)

(ii) the flux density, and (2 marks)

(iii) the total flux (2 marks)

(c) Explain **THREE (3)** classifications of DC motors with their applications. (6 marks)

(d) Determine the total dissipated power in three identical coils that contains resistor 100 Ω and inductance 42 mH when connected in a star to a 415 V, 50 Hz, 3-phase supply. (8 marks)

- END OF QUESTIONS -

TERBUKA

FINAL EXAMINATION

SEMESTER / SESSION : SEM II / 2018/2019
COURSE NAME : ELECTRICAL & ELECTRONIC
TECHNOLOGY

PROGRAMME CODE : BDC/BDM
COURSE CODE : BDU 10803

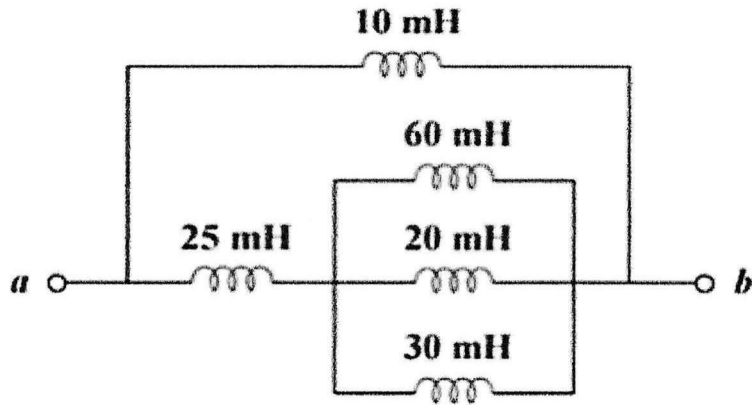


Figure Q1(b)

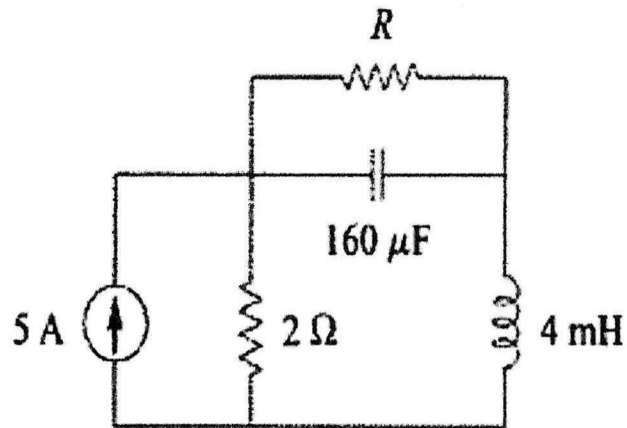


Figure Q1(c)

TERBUKA

FINAL EXAMINATION

SEMESTER / SESSION : SEM II / 2018/2019
 COURSE NAME : ELECTRICAL & ELECTRONIC TECHNOLOGY

PROGRAMME CODE : BDC/BDM
 COURSE CODE : BDU 10803

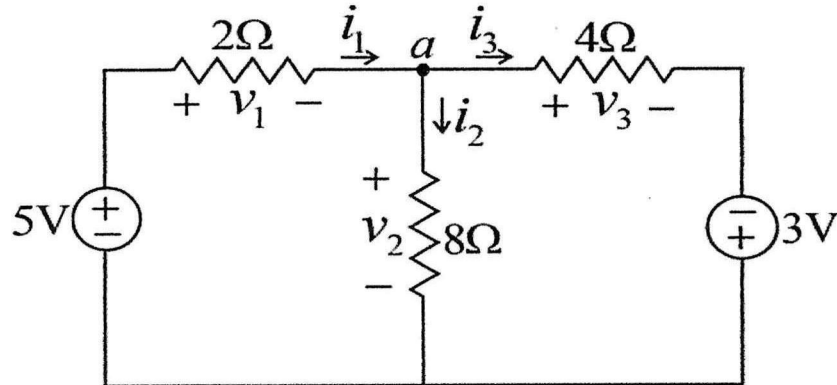


Figure Q1(d)

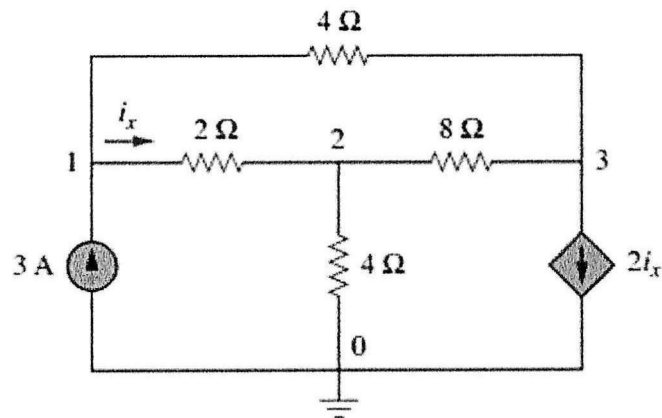


Figure Q2(a)(ii)

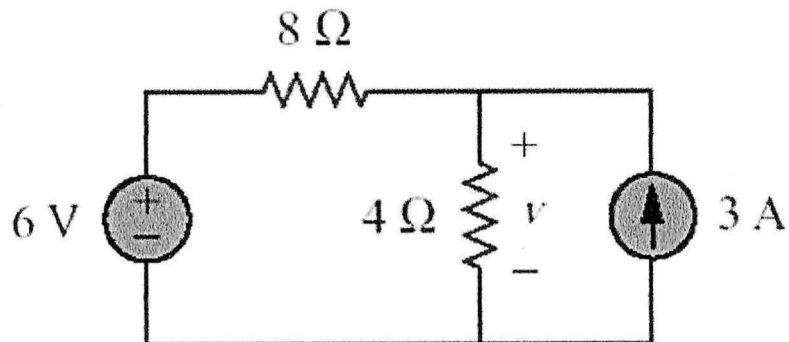


Figure Q2(b)

FINAL EXAMINATION

SEMESTER / SESSION : SEM II / 2018/2019
COURSE NAME : ELECTRICAL & ELECTRONIC TECHNOLOGY

PROGRAMME CODE : BDC/BDM
COURSE CODE : BDU 10803

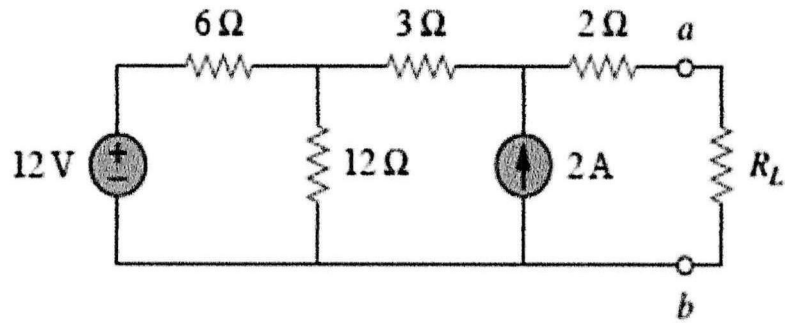


Figure Q2(c)

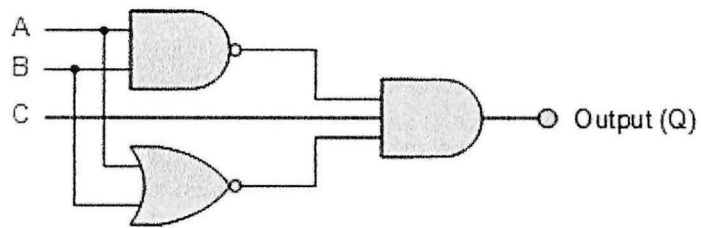


Figure Q3(b)

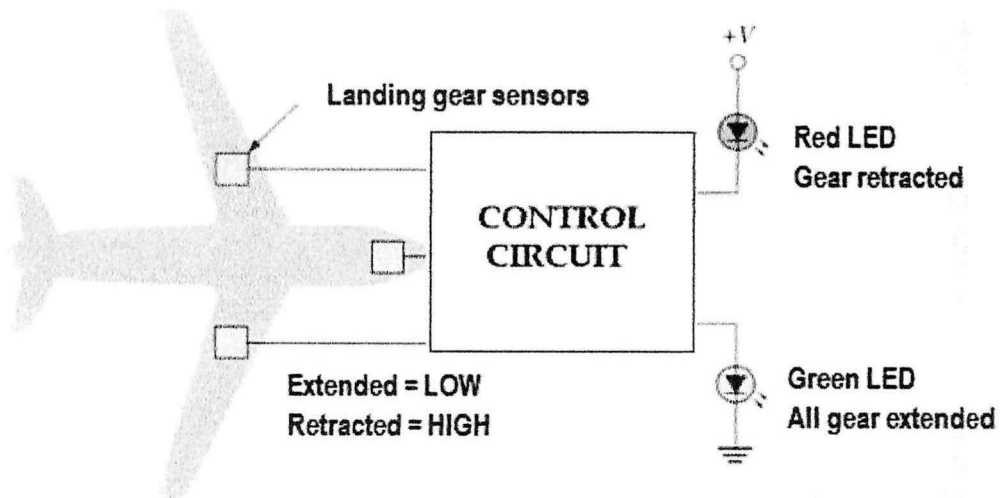


Figure Q3(c)