Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2018/2019

COURSE NAME	:	BASIC ELECTRIC AND ELECTRONIC
COURSE CODE	:	DAM 32103
PROGRAMME CODE	:	DAM
EXAMINATION DATE	:	DECEMBER 2018/ JANUARY 2019
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWERS **FIVE (5)** QUESTIONS ONLY

THIS QUESTION PAPER CONSISTS OF EIGHT (8) PAGES

QUESTION IN ENGLISH

Q1 Refer to **FIGURE Q1**:

(a) Find total resistance R_T.

(4 marks)

(b) Predict the voltage drop across resistance R_2 (V_{R2}), resistance R_4 (V_{R4}), resistance R_5 (V_{R5}), resistance R_6 (V_{R6}) and resistance R_7 (V_{R7}).

(8 marks)

(c) Solve the current flow through resistance R_2 (I_{R2}), resistance R_4 (I_{R4}), resistance R_5 (I_{R5}), resistance R_6 (I_{R6}) and resistance R_7 (I_{R7}).

(8 marks)

Q2 Refer to **FIGURE Q2**. Given V_1= 10V, V_2=12V, R_1= 3Ω, R_2= 4Ω and R_3= 12Ω.

By using Method of Branch Currents:

(a) Determine I_1 and I_2 obtain from that method.

(7 marks)

(b) Calculate voltage drop in R_1, R_2, $R_3$from I_{R1} and I_{R3}.

(6 marks)

(c) Sketch a design of light detector using Light-Dependent Resistor (LDR) and N555 to turn on light at night and off at daylight.

(7 marks)

Q3 Iron ring has a mean circumferential length of 30 cm and a cross-sectional area of 1 cm². It is wound uniformly with 600 turns of wire. Measurements made with a search coil around the ring show that the current in the windings is 0.06 A and the flux in the ring is 6×10^{-6} Wb.

(a) Predict the flux density B.

(4 marks)

(b) Calculate field intensity H.

(6 marks)

(c) Derive formula from **Question 3(a)** and **Question 3(b)** then determine permeability μ.

(6 marks)

(d) Calculate relative permeability μ_r from previous analysis **Question 3(c)**.

(4 marks)

Q4 (a) Deduce a condition at which an RLC circuit behaves like a resistive circuit. State whether the current in the circuit is minimum or maximum.

(10 marks)

(b) A 120 Hz with 25 mA Alternating Current (AC) flows in a circuit containing a 10 μF capacitor, a resistor 100 Ω and an indictor 100 H as shown in **FIGURE Q4(b)**. Determine is the voltage drop across the capacitor.

(10 marks)

Q5 (a) A coil of resistance 25 Ω and inductance 40 mH as shown in **FIGURE Q5(a)** is connected to a 50 Hz a.c. supply, and the current which then flows is 5.36 A.
Calculate:

i. The supply voltage

(2 marks)

ii. the circuit phase angle,

(4 marks)

iii. Impedance the power dissipated.

(4 marks)

(b) A circuit that converts the AC power-line voltage to the required DC value is called a power supply.

i. Describe in detail step by step to convert a AC power line voltage to DC voltage.

(4 marks)

ii. Illustrate by circuit schematic.

(6 marks)

Q6 Refer to **FIGURE Q6**, calculate;

(a) The secondary voltage, V_S.

(4 marks)

(b) The secondary current, I_S.

(4 marks)

(c) The secondary power, P_S.

(4 marks)

(d) The primary power, P_P.

(4 marks)

(e) The primary current, I_P.

(4 marks)

Q7 (a) Evaluate the field intensity for:

i) Refer to **FIGURE Q7(a)(i)**, 40-turn and 10-cm long coil with 3 A current flowing in it.

(4 marks)

ii) Refer to **FIGURE Q7(a)(ii)**, 40-turn and 20-cm long coil with 3 A current flowing in it.

(4 marks)

iii) Refer to **FIGURE Q7(a)(iii)**, 40-turn and length of coil is 10 cm and 3 A current flowing and wound around an iron core that is 20 cm long. Differentiate the changes in the length of the coil and adding an iron core effect the result.

(7 marks)

(b) Calculate the flux density in tesla's when there exists a flux of 600μWb through an area of 0.0003 m^2.

(5 marks)

- END OF QUESTION -

FINAL EXAMINATION

SEMESTER / SESSION	**: SEM I / 2018/2019**	**PROGRAMME**	**: DAM**
COURSE	**: BASIC ELECTRIC AND ELECTRONIC**	**COURSE CODE**	**: DAM 32103**

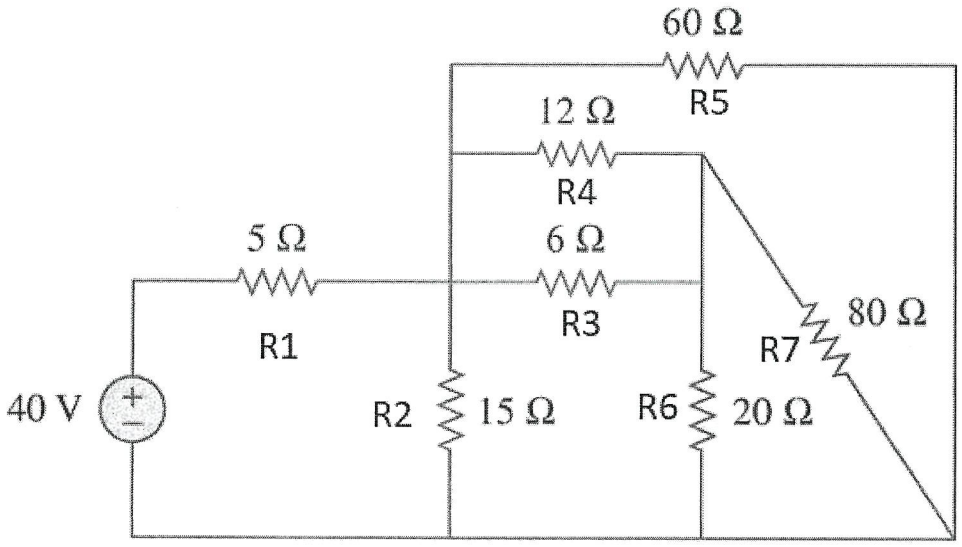

Figure Q1

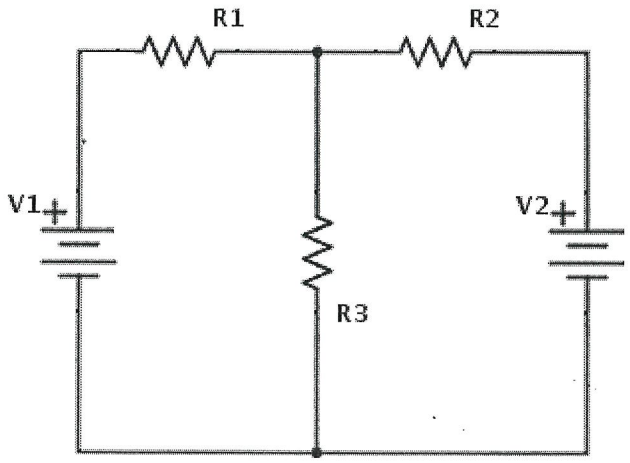

Figure Q2

FINAL EXAMINATION

SEMESTER / SESSION	**: SEM I / 2018/2019**	**PROGRAMME**	**: DAM**
COURSE	**: BASIC ELECTRIC AND ELECTRONIC**	**COURSE CODE**	**: DAM 32103**

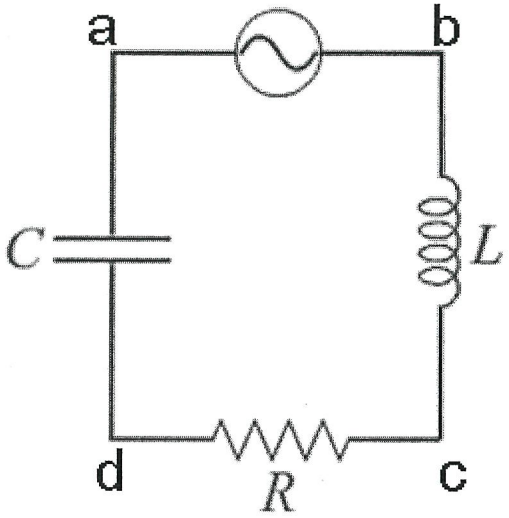

Figure Q4(b)

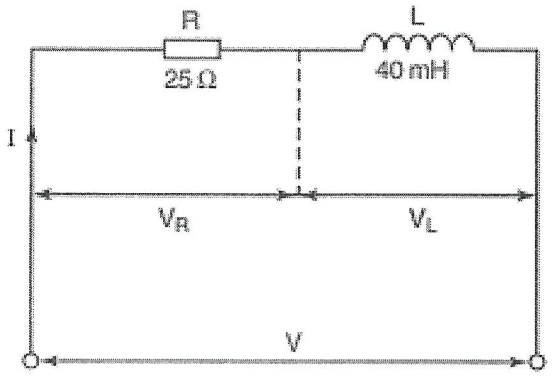

Figure Q5(a)

FINAL EXAMINATION

SEMESTER / SESSION	**: SEM I / 2018/2019**	**PROGRAMME**	**: DAM**
COURSE	**: BASIC ELECTRIC AND ELECTRONIC**	**COURSE CODE**	**: DAM 32103**

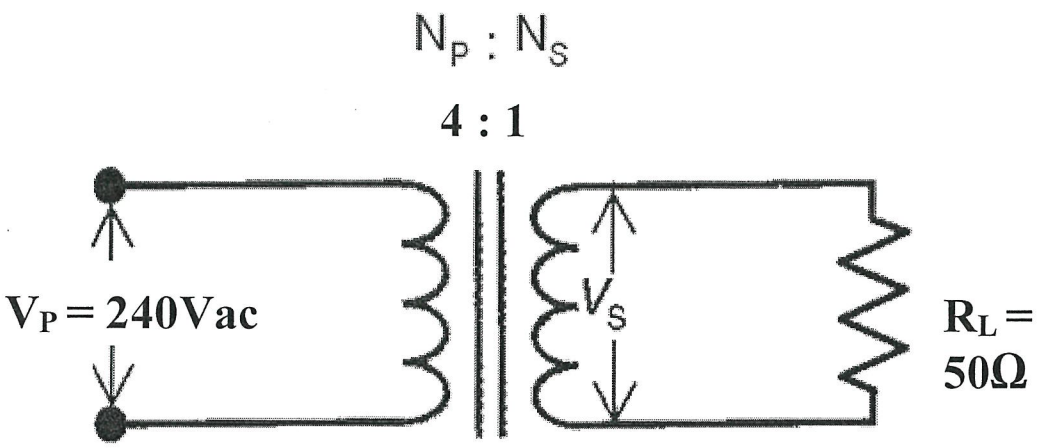

Figure Q6

FINAL EXAMINATION

SEMESTER / SESSION	**: SEM I / 2018/2019**	**PROGRAMME**	**: DAM**
COURSE	**: BASIC ELECTRIC AND ELECTRONIC**	**COURSE CODE**	**: DAM 32103**

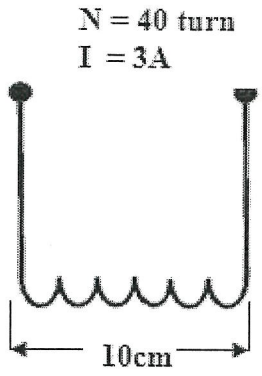

Figure S7(a)(i)

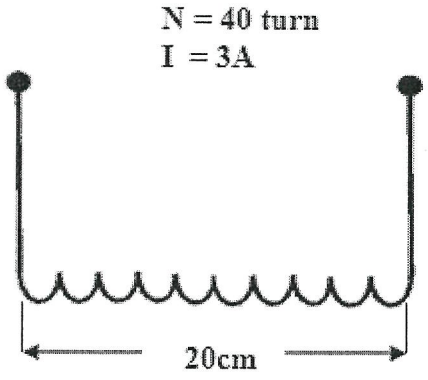

Figure S7(a)(ii)

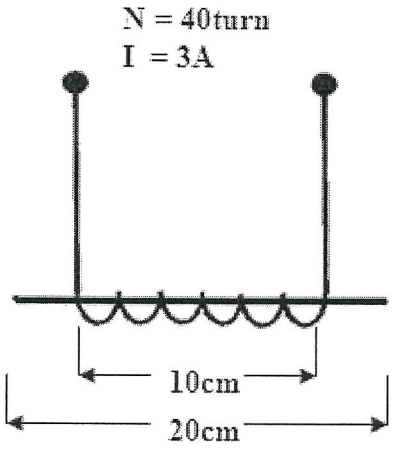

Figure S7(a)(iii)