Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

PEPERIKSAAN AKHIR
SEMESTER I
SESI 2015/2016

NAMA KURSUS	:	ASAS ELEKTRIK DAN ELEKTRONIK
KOD KURSUS	:	DAM 32103
PROGRAM	:	2 DAM
TARIKH PEPERIKSAAN	:	DISEMBER 2015/ JANUARI 2016
MASA	:	3 JAM
ARAHAN	:	JAWAB **LIMA (5)** SOALAN

KERTAS SOALAN INI MENGANDUNGI **EMPAT BELAS (14)** MUKA SURAT

SOALAN DI DALAM BAHASA MELAYU

S1 Berdasarkan **RAJAH S1**:

(a) Cari jumlah rintangan R_T

(4 markah)

(b) Ramalkan kejatuhan voltan melalui perintang R_2 (V_{R2}), perintang R_4 (V_{R4}), perintang R_5 (V_{R5}), perintang R_6 (V_{R6}) dan perintang R_7 (V_{R7}).

(8 markah)

(c) Menggunakan ramalan kejatuhan voltage tentukan arus yang mengalir melalui perintang R_2 (I_{R2}), perintang R_4(I_{R4}), perintang R_5 (I_{R5}), perintang R_6 (V_{R6}) dan perintang R_7 (I_{R7})

(8 markah)

S2 Berdasarkan **RAJAH S2**. Diberikan V_A= 100V, V_B=60V, R_1= 27Ω, R_2= 45Ω, dan R_3= 50Ω.

Dengan menggunakan *node-voltage analysis*;

(a) Tentukan I_1 dan I_2.

(12 markah)

(b) Kirakan kejatuhan voltan dalam R_1, R_2, R_3.

(8 markah)

S3 Cincin besi mempunyai panjang purata lilitan 40 cm dan luas keratan rentas 1-cm ^{2}. Ia digulung seragam dengan 500 lilitan wayar. Pengukuran dibuat dengan carian gegelung sekitar cincin menunjukkan bahawa arus dalam belitan adalah 0.06 A dan fluks di *winding* adalah 6×10^{-6} Wb

(a) Hitungkan *flux density* B,

(4 markah)

(b) Kirakan *field intensity* H,

(6 markah)

(c) Kirakan *permeability* μ, dan

(6 markah)

(d) Kirakan *relative permeability* μr.

(4 markah)

S4 (a) Huraikan dan terangkan **5 jenis** kapasitor secara terperinci..

(10 markah)

(b) Satu arus ulang alik (AC) 120Hz 25mA mengalir dalam litar yang mengandungi kapasitor 10μF seperti yang ditunjukkan dalam **RAJAH S4**. Tentukan kejatuhan voltan merentasi kapasitor.

(10 markah)

S5 (a) Satu litar berperintang 500Ω secara selari dengan induktor 300Ω X_L seperti yang ditunjukkan dalam **RAJAH S5(a)**. Kirakan;

i. Jumlah arus talian I_T,

(2 markah)

ii. Sudut fasa θ, dan

(4 markah)

iii. Impedans Z_T.

(4 markah)

(b) Satu litar yang menukar voltan talian kuasa AC kepada nilai diperlukan DC dipanggil bekalan kuasa. Terangkan secara terperinci langkah demi langkah untuk menukar kuasa AC voltan talian kepada voltan DC. Ilustrasikan ia dengan skematik litar.

(10 markah)

S6 Berdasarkan **RAJAH S6**, kirakan;

(a) Voltan sekunder , V_S

(4 markah)

(b) Arus sekunder, I_S

(4 markah)

(c) Kuasa sekunder, P_S

(4 markah)

(d) Kuasa primer, P_P

(4 markah)

(e) Arus primer, I_P

(4 markah)

S7 (a) Kirakan *field intensity* pada;

i) Berdasarkan **RAJAH S7(i),** 40 lilitan dan 10 cm panjang gegelung dengan 3 A arus mengalir melaluinya.

(4 markah)

ii) Berdasarkan **RAJAH S7(ii),** 40 lilitan dan 20 cm panjang gegelung dengan 3 A arus mengalir melaluinya.

(4 markah)

iii) Berdasarkan **RAJAH S7(iii),** 40 lilitan dan 10 cm panjang gegelung dengan 3 A arus mengalir melaluinya dan dililit pada rod besi sepanjang 20 cm. Bezakan perubahan panjang gegelung dan penambahan rod besi.

(7 markah)

(b) Kirakan ketumpatan fluk dalam unit tesla apabila terdapat fluk sebanyak 600μWb dalam keluasan kawasan 0.0003 m^2.

(5 markah)

-SOALAN TAMAT-

SOALAN DI DALAM BAHASA INGGERIS

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_A= 100V, V_B=60V, R_1= 27Ω, R_2= 45Ω, and R_3= 50Ω.*

By using node-voltage analysis method:

(a) *Determine I_1 and I_2.*

(7 marks)

(b) *Calculate voltage drop in R_1, R_2, R_3.*

(6 marks)

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

(7 marks)

Q3 *An iron ring has a mean circumferential length of 40-cm and a cross-sectional area of 1-cm². It is wound uniformly with 500 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 x 10^{-6} Wb*

(a) *Predict the flux density B,*

(4 marks)

(b) *Calculate field intensity H,*

(6 marks)

(c) *Calculate permeability μ, and*

(6 marks)

(d) *Calculate relative permeability μ_r.*

(4 marks)

Q4 (a) *Describe and explain 5 type of capacitor in detail.*

(10 marks)

(b) *A 120-Hz 25-mA Alternating Current (AC) flows in a circuit containing a 10μF capacitor as shown in* ***FIGURE Q4(b)****. What is the voltage drop across the capacitor?*

(10 marks)

Q5 (a) *A circuit 500Ω Resistor is in parallel with 300Ω X_L inductor as shown in* ***FIGURE Q5(a).***

Calculate:

i. *The total circuit current I_T,*

(2 marks)

ii. *the phase angle θ, and*

(4 marks)

iii. *Impedance Z_T.*

(4 marks)

(b) *A circuit that converts the AC power-line voltage to the required DC value is called a power supply. Describe in detail step by step to convert a AC power line voltage to DC voltage. Illustrate by circuit schematic.*

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

(4 marks)

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

(4 marks)

*iii) Refer to **FIGURE Q7(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 m².

(5 marks)

-END OF QUESTION-

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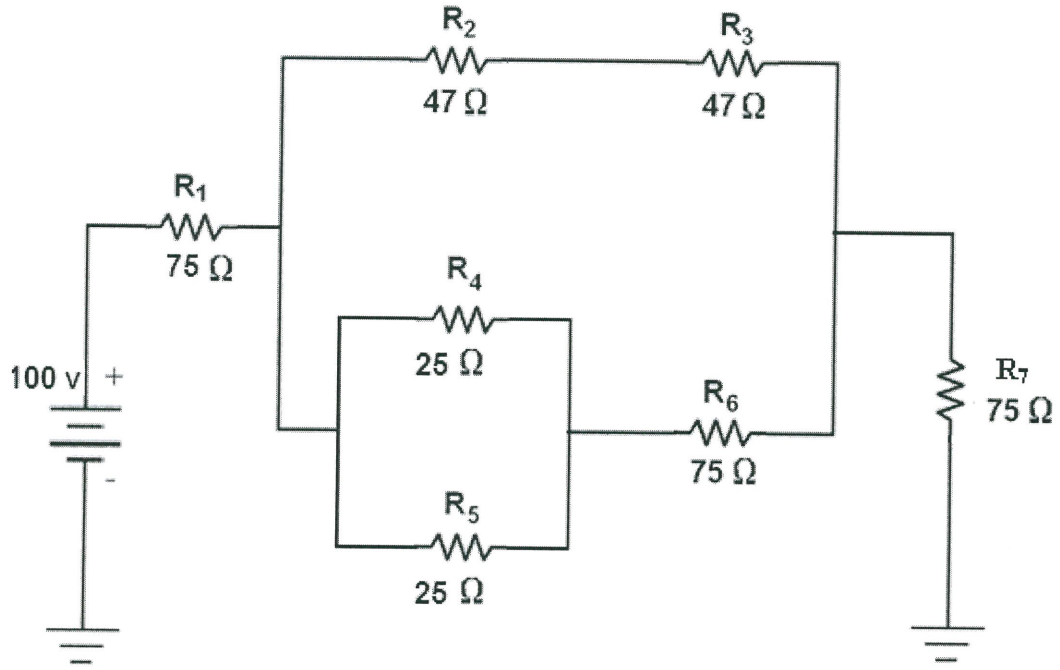

RAJAH S1 / FIGURE Q1

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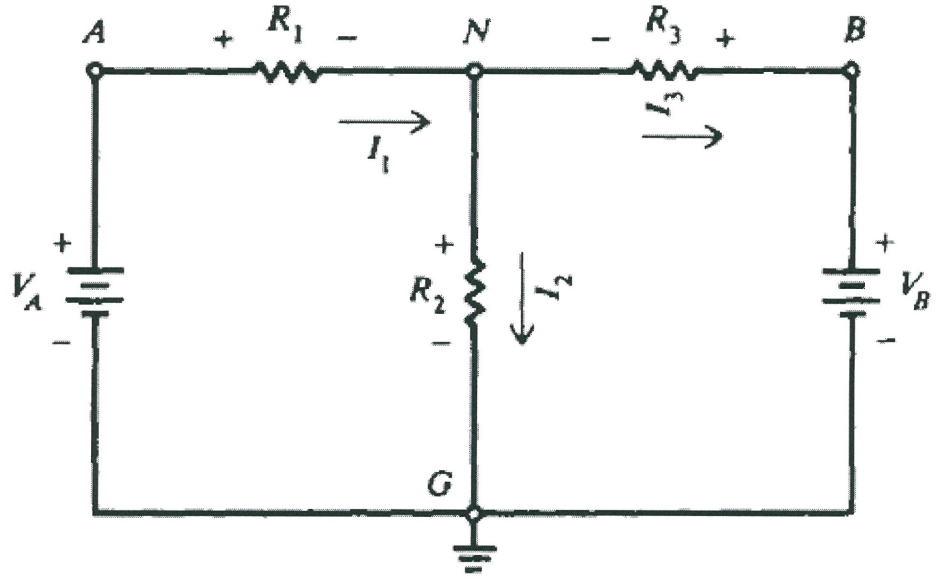

RAJAH S2 / FIGURE Q2

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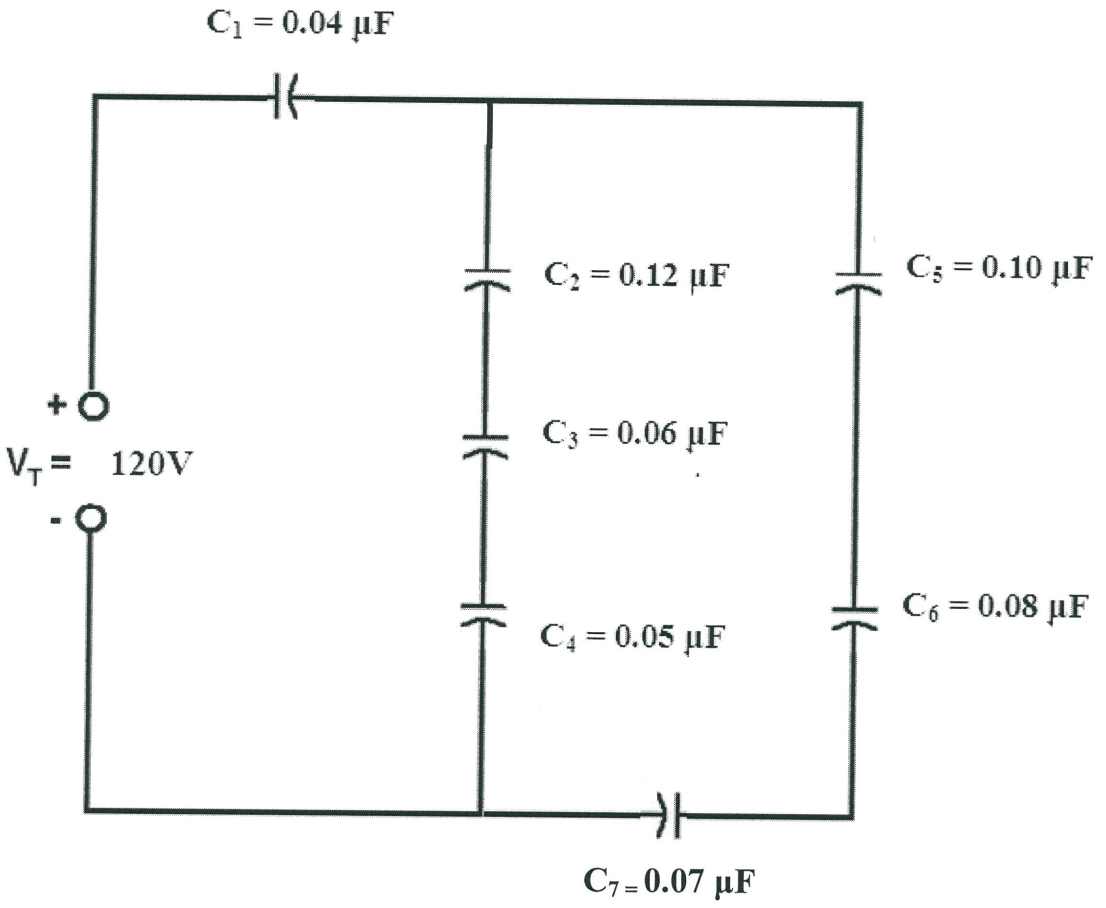

RAJAH S3 / FIGURE Q3

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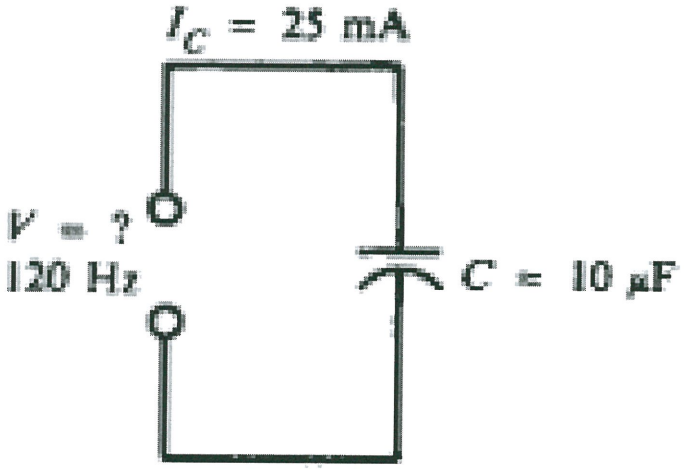

RAJAH S4(b) / FIGURE Q4(b)

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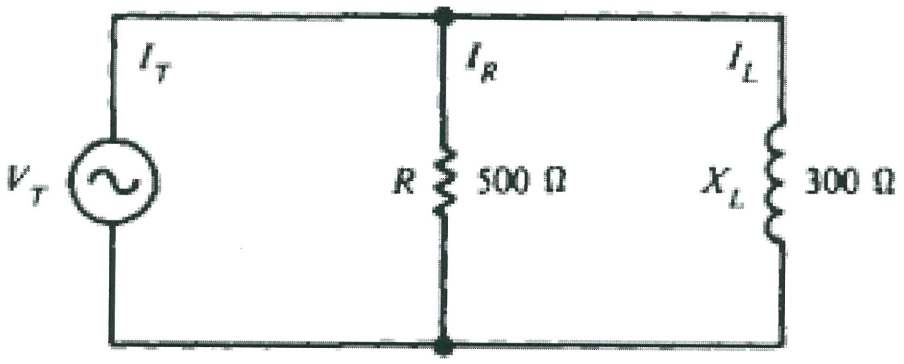

RAJAH S5(a) / FIGURE Q5(a)

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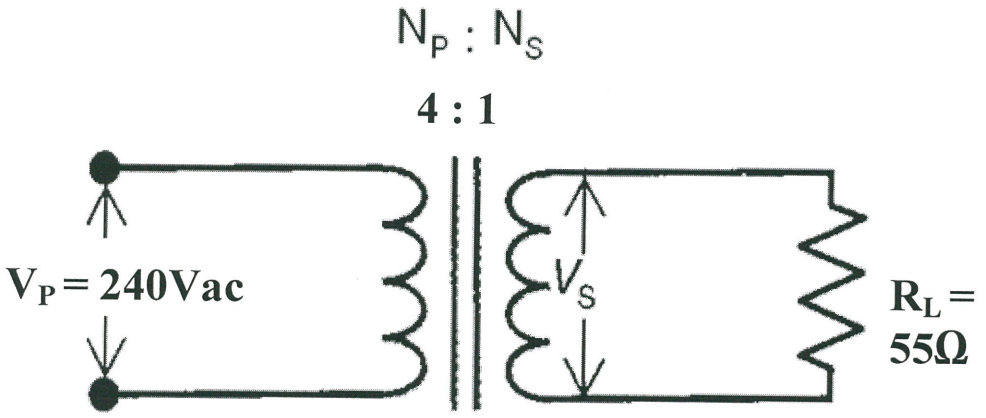

RAJAH S6 / FIGURE Q6

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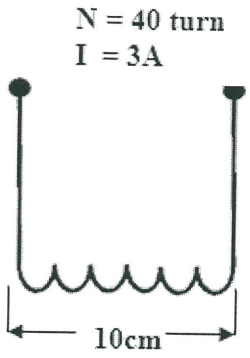
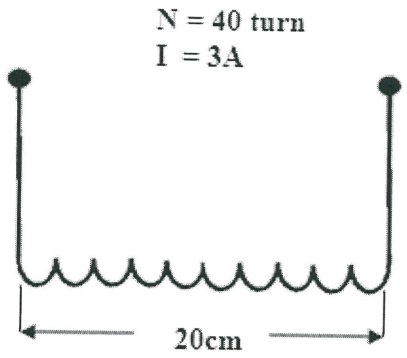
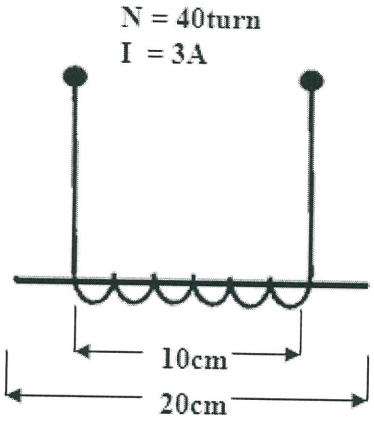


RAJAH S7(i) / FIGURE S7(i)



RAJAH S7(ii) / FIGURE S7(ii)



RAJAH S7(iii) / FIGURE S7(iii)