KYPJ
KOLEJ YAYASAN
PELAJARAN JOHOR

## KOLEJ YAYASAN PELAJARAN JOHOR
FINAL EXAMINATION

COURSE NAME	:	**CIRCUIT THEORY**
COURSE CODE	:	**DKE 1053**
EXAMINATION	:	**APRIL 2019**
DURATION	:	**2 HOURS 30 MINUTES**

INSTRUCTION TO CANDIDATES

1. This examination paper consists of **SIX (6)** QUESTIONS. Answer **ALL** questions in the answer booklet provided.

2. Candidates are not allowed to bring any material to examination room except with the permission from the invigilator.

3. Please check to make sure that this examination pack consist of:
    i.   Question Paper
    ii. Answer Booklet

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO

This examination paper consists of 7 printed pages including front page
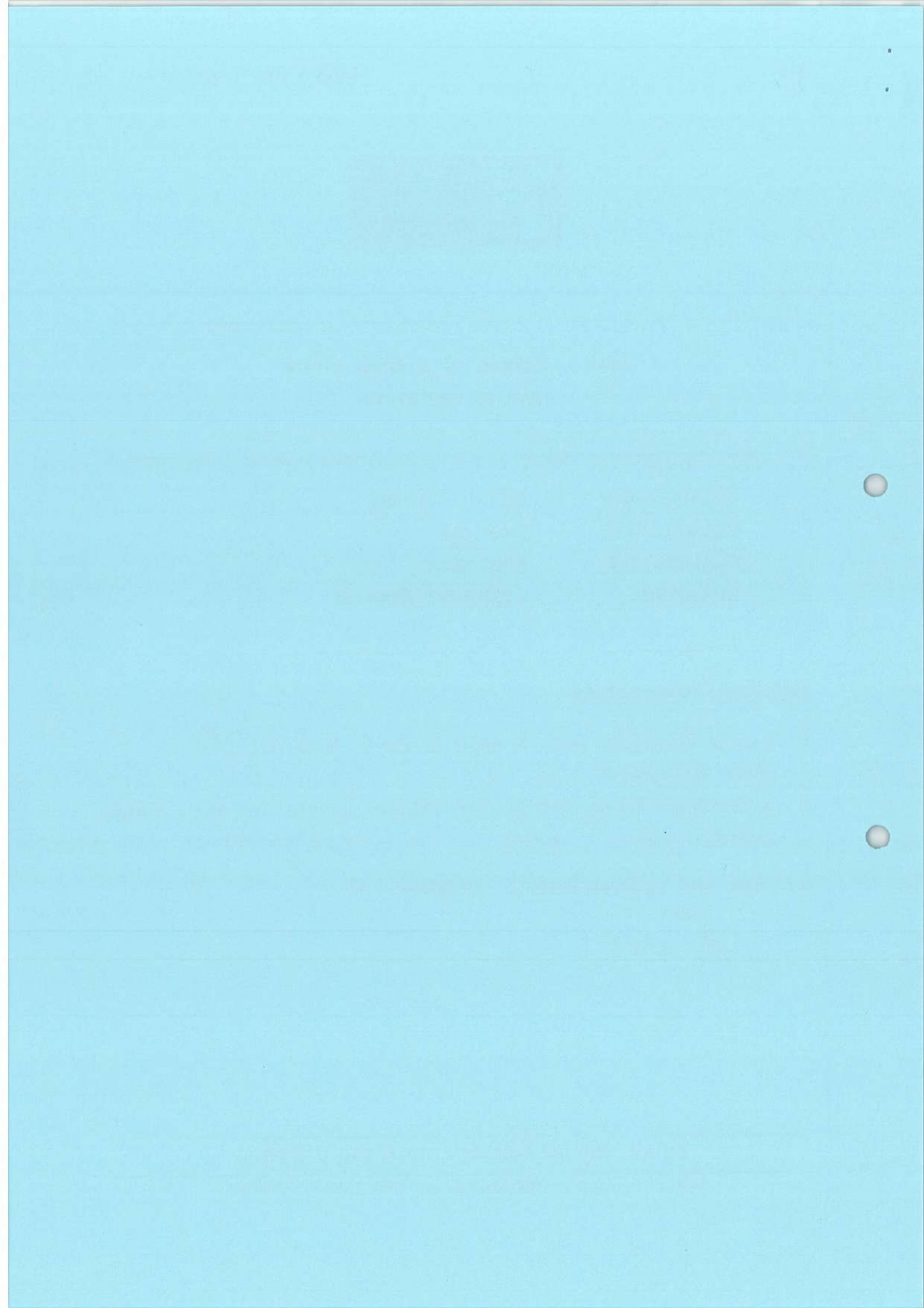
This paper contains of **SIX(6)** questions. Answer **ALL** questions in the Answer Booklet.

Kertas soalan ini mengandungi ENAM(6) soalan. Jawab SEMUA soalan di dalam buku jawapan yang disediakan.

QUESTION 1 / SOALAN 1

Given the following daily energy usage:

Two (2) 5.5 hp air conditioners for 4 hours 30 minutes.

Three (3) 6700 W clothes dryer for 3 hours 50 minutes.

Five (5) 850 W washing machines for 3 hours 10 minutes.

Nine (9) 150 W fans for 9 hours 20 minutes.

Calculate the total cost of electricity for October at 0.25 cents per kilowatthour.
(Given 1 hp = 746 W and 1 month of October = 31 days)

Diberi penggunaan tenaga harian seperti di bawah:

Dua(2) 5.5 hp penyaman udara untuk 4 jam 30 minit.

Tiga (3) 6700 W pengering pakaian untuk 3 jam 50 minit.

Lima (5) 850 W mesin basuh untuk 3 jam 10 minit.

Sembilan (9) 150 W kipas untuk 9 jam 20 minit.

Kirakan jumlah kos elektrik untuk bulan Oktober pada 0.25 sen per kilowattjam.
(Diberi 1 hp = 746 W dan 1 bulan Oktober = 31 hari

(10 marks / *markah*)

QUESTION 2 / SOALAN 2

Based on Figure 2, determine the following values:

   i. the total resistance viewed from the voltage supply.

   ii. the supply current, Is.

   iii. the voltage, V_{AB} using voltage divider rule.

   iv. the voltage, V_5 using Kirchhoff's voltage law.

   v. the current, I_4 using current divider rule.

   vi. the current, I_x using Kirchhoff's current law.

   vii.convert R_1, R_2, and R_3 to the delta-connected resistor and redraw the circuit.

Berdasarkan kepada Rajah 2, tentukan nilai berikut:

   i. jumlah rintangan dilihat dari bekalan voltan.

   ii. arus bekalan, Is.

   iii. voltan, V_{AB} menggunakan aturan pembahagi voltan.

   iv. voltan, V_5 menggunakan hukum voltan Kirchhoff.

   v. arus, I_4 menggunakan aturan pembahagi arus.

   vi. arus, I_x menggunakan hukum arus Kirchhoff.

   vii.tukarkan R_1, R_2, dan R_3 kepada litar sambungan delta dan lukis semula litar.
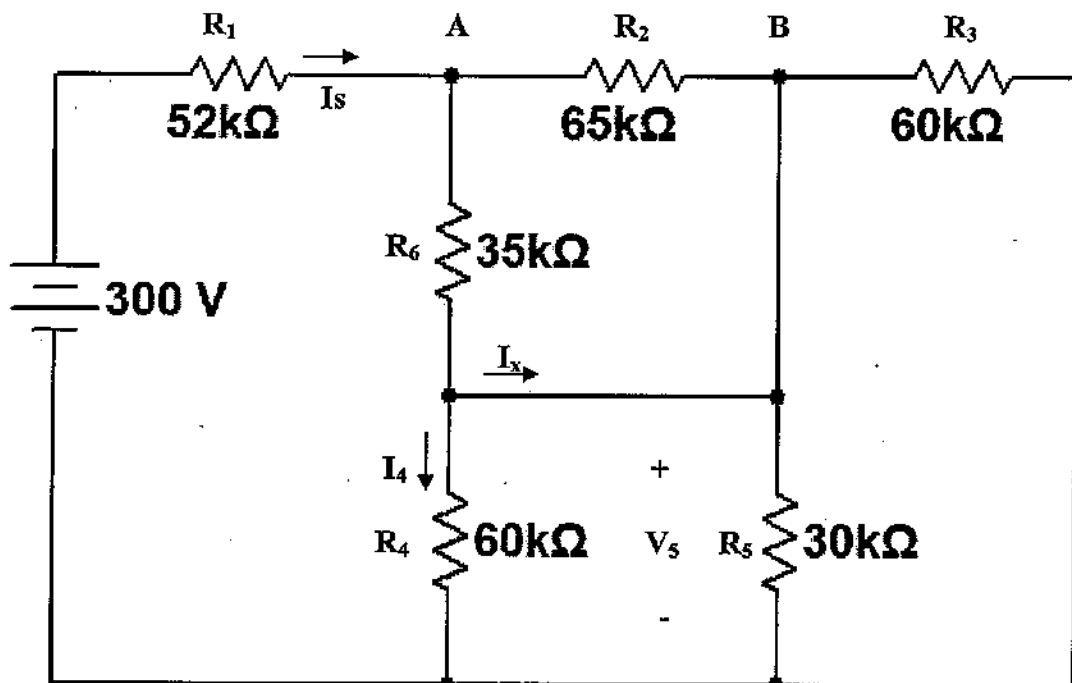

Figure 2 / *Rajah 2*

(20 marks / *markah*)

QUESTION 3 / SOALAN 3

Based on Figure 3, looking from terminal A-B,

   i. Find the Norton's equivalent resistance, R_N.

   ii. Determine the Norton's equivalent current, I_N using superposition analysis.

   iii. Draw the Norton's equivalent circuit.

   iv. Calculate the current flow through the load resistor, R_L.

Berdasarkan kepada Rajah 3, dilihat dari terminal A-B,

   i. Dapatkan rintangan setara Norton, R_N.

   ii. Tentukan voltan setara Norton, I_N dengan menggunakan teorem tindihan.

   iii. Lukiskan litar setara Norton.
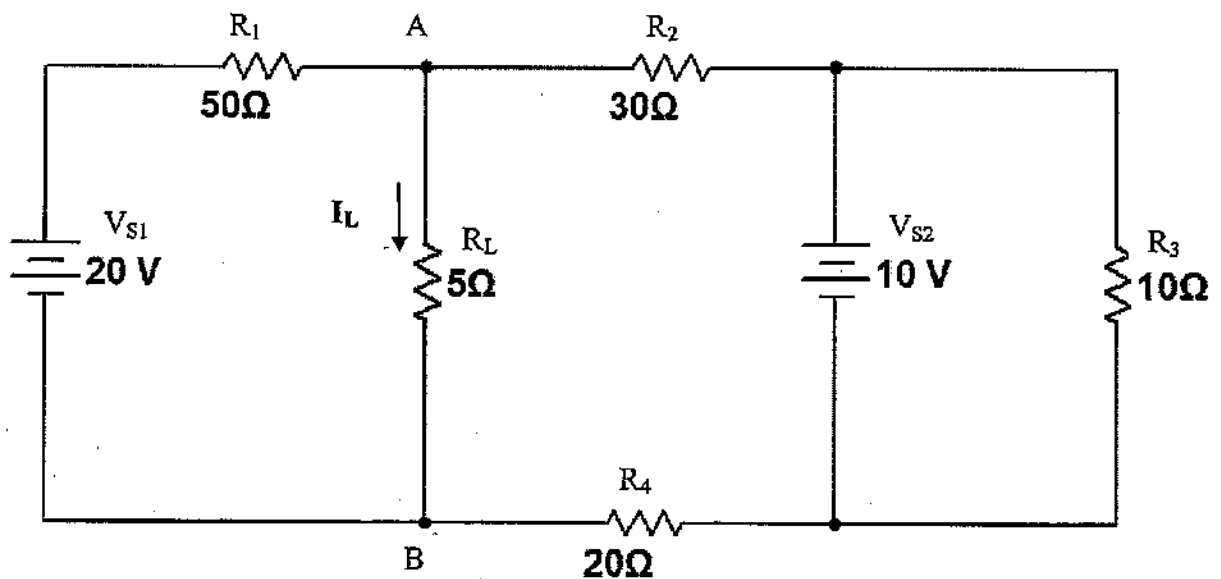
   iv. Kirakan arus melalui perintang beban, R_L.

Figure 3 / *Rajah 3*

(18 marks / *markah*)

QUESTION 4 / SOALAN 4

Based on Figure 4, given that $v_s(t)=127.3 \sin(2000t+80°)$V. Find:

i.   Total impedance, Z_T and draw the impedance triangle.

ii.   Source current, i_s.

iii. Current, $i_L(t)$.

Berdasarkan kepada Rajah 4, diberi $v_s(t)=127.3 \sin(2000t+80°)$V. Cari:

i.   *Jumlah galangan, Z_T dan lukis segitiga galangan.*

ii.   *Arus bekalan, i_s.*

iii. *Arus, $i_L(t)$.*

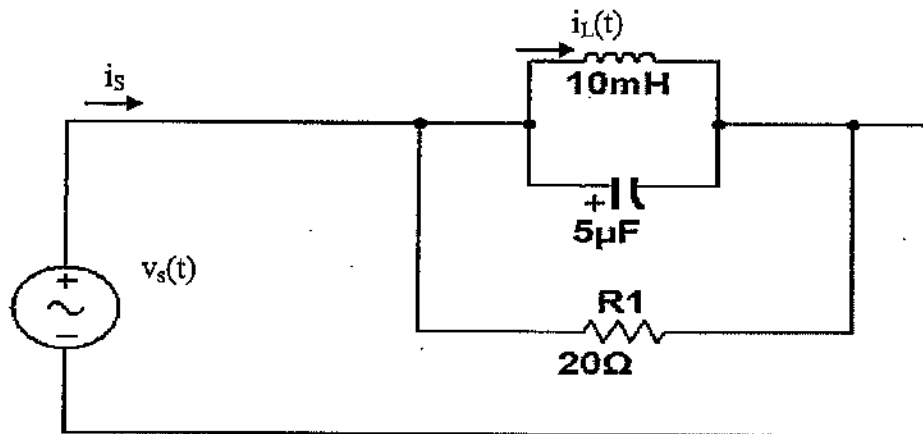Figure 4 / *Rajah 4*

(18 marks / *markah*)

QUESTION 5 / SOALAN 5

Based on Figure 5, use source conversion method to determine the value of V_x.

Berdasarkan kepada Rajah 5, gunakan kaedah penukaran sumber bekalan untuk tentukan nilai V_x.
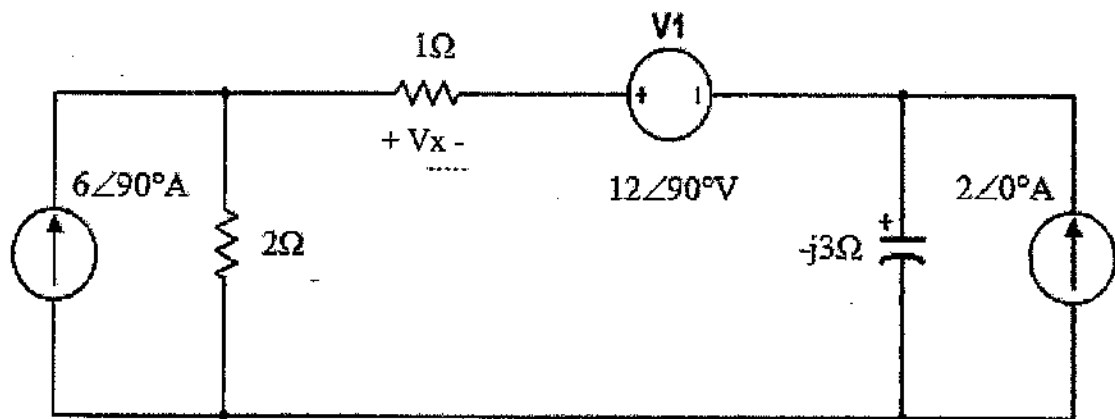

Figure 5 / *Rajah 5*

(16 marks / *markah*)

QUESTION 6 / SOALAN 6

For the circuit shown in Figure 6, find the average power being

   i. dissipated in the 3Ω resistor.

   ii. generated by the source.

Untuk litar yang ditunjukkan dalam Rajah 6, dapatkan kuasa purata yang

   i. dilesapkan dalam perintang 3Ω.
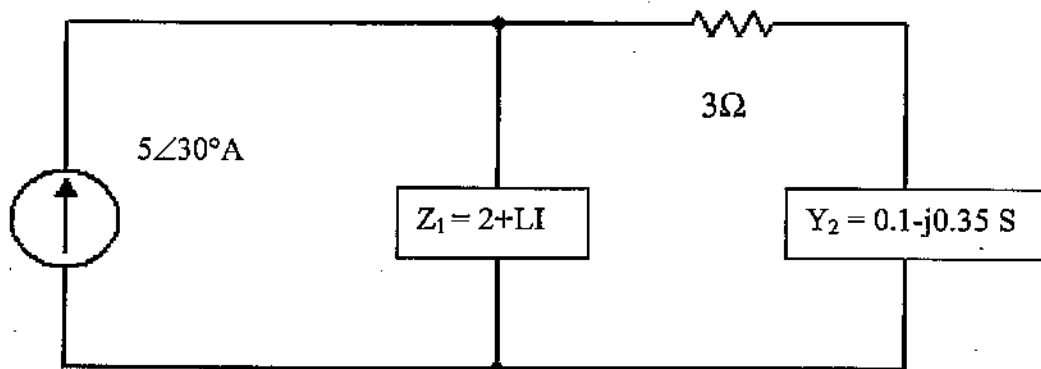
   ii. dijanakan oleh sumber.

Figure 6 / *Rajah 6*

(18 marks / *markah*)

END OF QUESTION PAPER / KERTAS SOALAN TAMAT