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**KOLEJ YAYASAN PELAJARAN JOHOR  
ONLINE FINAL EXAMINATION**

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**COURSE NAME : ELECTRONICS 1**  
**COURSE CODE : DKE 1073**  
**EXAMINATION : DECEMBER 2021**  
**DURATION : 2 HOURS 30 MINUTES**

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**INSTRUCTION TO CANDIDATES /  
ARAHAN KEPADA CALON**

1. This examination paper consists of **ONE (1)** part : / PART A (100 Marks) /  
*Kertas soalan ini mengandungi **SATU (1)** bahagian: BAHAGIAN A (100 Markah)*
2. Answer ALL questions in the answer sheet which is A4 size paper (or other paper with the consent of the relevant lecturer). /  
*Jawab **SEMUA** soalan di dalam kertas jawapan iaitu kertas bersaiz A4 (atau lain-lain kertas dengan persetujuan pensyarah berkaitan).*
3. Write your details as follows in the upper left corner for each answer sheet: /  
*Tulis butiran anda sepertimana berikut di penjuru atas kiri bagi setiap kertas jawapan:*
  - i. Student Full Name / *Nama Penuh Pelajar*
  - ii. Identification Card (I/C) No. / *No. Kad Pengenalan*
  - iii. Class Section / *Seksyen Kelas*
  - iv. Course Code / *Kod Kursus*
  - v. Course Name / *Nama Kursus*
  - vi. Lecturer Name / *Nama Pensyarah*
4. Each answer sheet must have a page number written at the bottom right corner. /  
*Setiap helai kertas jawapan mesti ditulis nombor muka surat di penjuru bawah kanan.*
5. Answers should be **neat and clear in handwritten form.** /  
*Jawapan hendaklah ditulis tangan, kemas dan jelas.*

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**DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO /  
JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU**

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This examination paper consists of 6 printed pages including front page  
*Kertas soalan ini mengandungi 6 muka surat termasuk kulit hadapan*

This part contains **FIVE (5)** questions. Answer **ALL** questions in answer sheet.

*Bahagian ini mempunyai LIMA (5) soalan. Jawab SEMUA soalan di dalam kertas jawapan.*

### QUESTION 1/ SOALAN 1

- a) Explain how the covalent bonds are formed.

**(3 marks/ markah)**

- b) Define doping and state the difference between intrinsic and extrinsic semiconductors.

**(7 marks/ markah)**

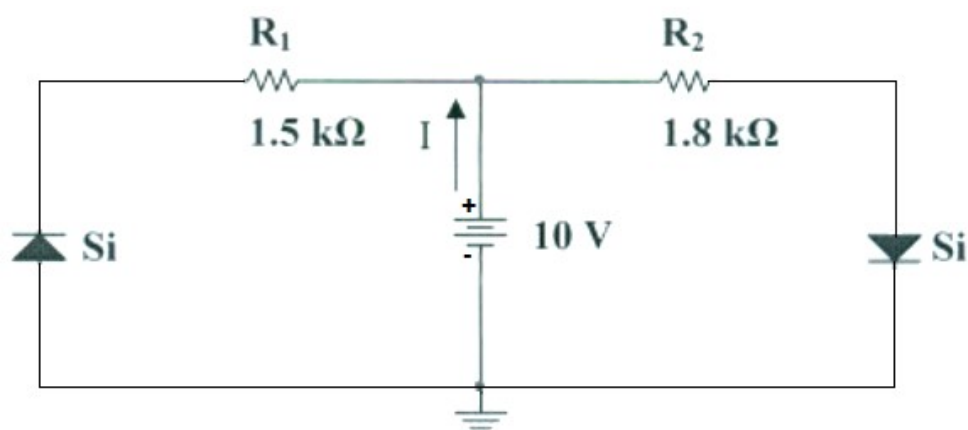
- c) Determine the voltage drop across resistor  $R_1$  and  $R_2$  then find the current  $I$  in the circuit of **Figure Q1(c)**.

**(10 marks/ markah)**

- a) *Terangkan bagaimana ikatan kovalen terbentuk.*

- b) *Berikan definisi pengedapan dan nyatakan perbezaan di antara separuh pengalir intrinsik dan ekstrinsik.*

- c) *Tentukan voltan susut pada perintang  $R_1$  dan  $R_2$  kemudian dapatkan arus  $I$  pada litar di **Rajah Q1(c)**.*



**Figure Q1(c) / Rajah Q1(c)**

## QUESTION 2/ SOALAN 2

- a) List and explain **three (3)** applications of diodes.

(6 marks/ *markah*)

- b) Determine the condition of the diode in **Figure Q2(b)**, which determines whether the diode is forward or reverse bias.

(4 marks/ *markah*)

- c) Based on **Figure Q2(c)**, sketch and label the output voltage,  $V_o$  with reference to the input,  $V_i$ . Show your analysis.

(10 marks/ *markah*)

- a) *Senaraikan dan terangkan tiga (3) aplikasi diod.*

- b) *Tentukan keadaan diod dalam Rajah Q2(b), samaada diod pincang hadapan atau pincang balikan.*

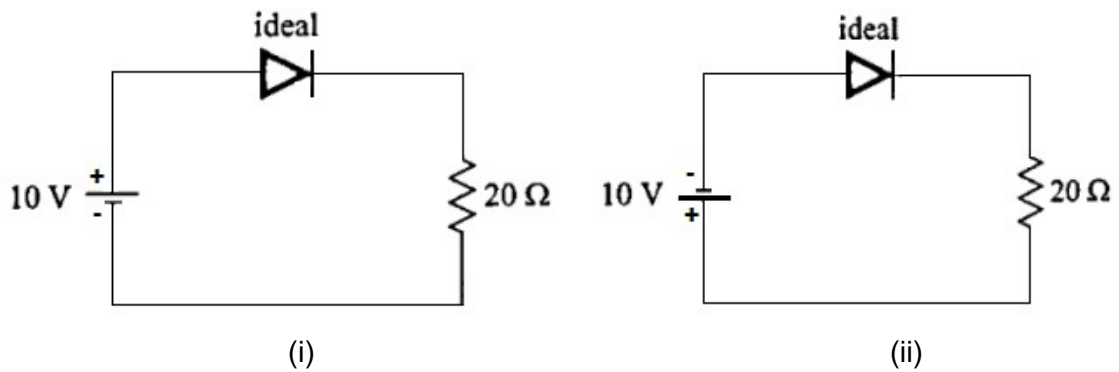


Figure Q2(b) / Rajah Q2(b)

- c) *Berdasarkan Rajah Q2(c), lakar dan labelkan voltan keluaran,  $V_o$  merujuk kepada masukan,  $V_i$ . Tunjukkan analisis anda.*

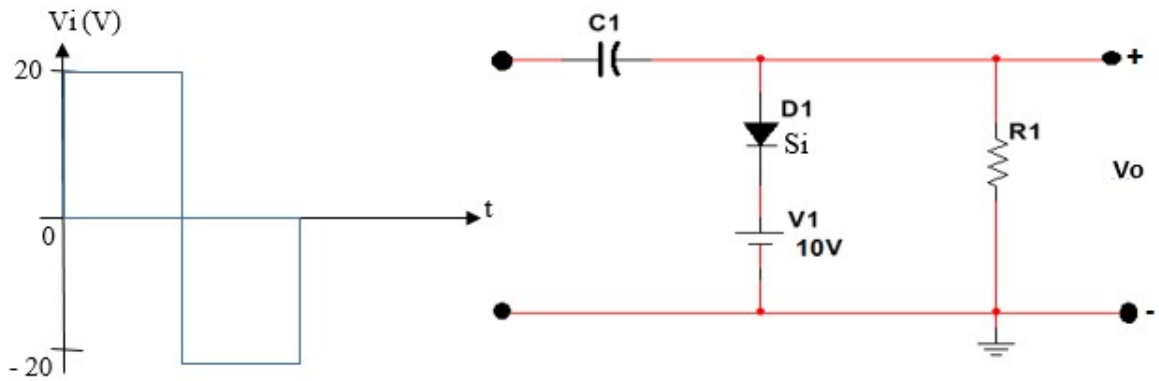


Figure Q2(c) / Rajah Q2(c)

## QUESTION 3/ SOALAN 3

- a) Given the information appearing in **Figure Q3(a)**, determine :
- collector current,  $I_C$ .
  - collector resistance,  $R_C$ .
  - base resistance,  $R_B$ .
  - collector-emitter voltage,  $V_{CE}$ .

(11 marks/ markah)

- b) **Figure Q3(b)** shows a transistor circuit simulated by computer software. U1 shows the voltage reading at the collector. Calculate the current gain of the transistor 2N4424.

(9 marks/ markah)

- a) Dengan maklumat yang diberikan dalam **Rajah Q3(a)**, tentukan :
- arus pemungut,  $I_C$ .
  - rintangan pemungut,  $R_C$ .
  - rintangan tapak,  $R_B$ .
  - voltan pemungut-pemancar,  $V_{CE}$ .

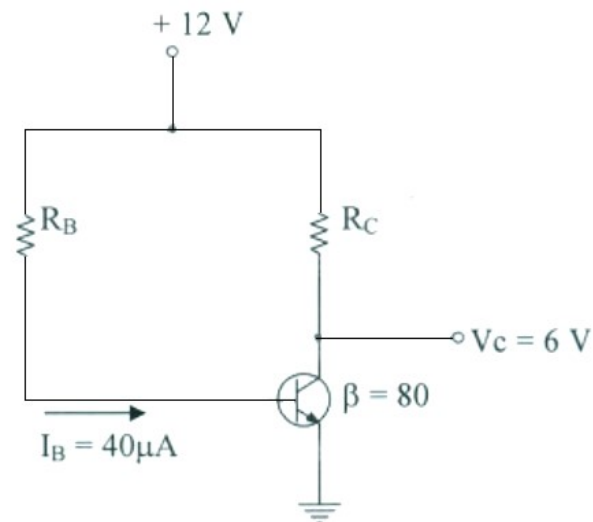


Figure Q3(a) / Rajah Q3(a)

- b) **Rajah Q3(b)** menunjukkan litar transistor yang disimulasi menggunakan perisian komputer. U1 menunjukkan bacaan voltan yang diperolehi pada kaki pemungut. Kirakan gandaan arus bagi transistor 2N4424.

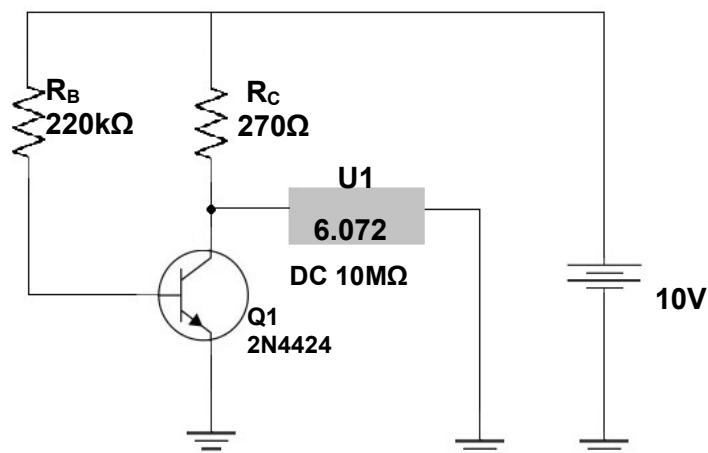


Figure Q3(b) / Rajah Q3(b)

## QUESTION 4/ SOALAN 4

Based on **Figure Q4** :

- Sketch AC equivalent circuit using re model.
- Determine input impedance,  $Z_i$ .
- Determine output impedance,  $Z_o$ .
- Determine voltage gain,  $A_v$ .
- Determine current gain,  $A_i$ .

(20 marks/ markah)

Berdasarkan **Rajah Q4** :

- i) Lakarkan litar setara AU dengan menggunakan model re.
- ii) Tentukan galangan masukan,  $Z_i$ .
- iii) Tentukan galangan keluaran,  $Z_o$ .
- iv) Tentukan gandaan voltan,  $A_v$ .
- v) Tentukan gandaan arus,  $A_i$ .

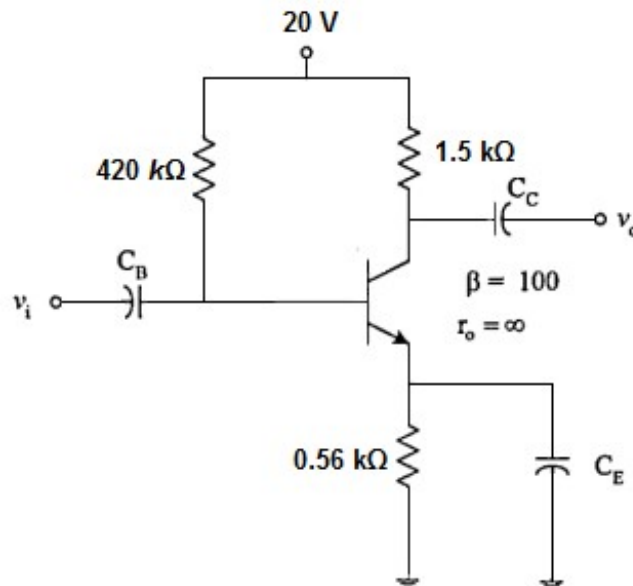


Figure Q4 / Rajah Q4

#### QUESTION 5/ SOALAN 5

Sketch the simple circuit of LED, Photo Diode, Zener Diode and Schottky Diode. Then, explain their operational principles by using your own word.

(20 marks/ markah)

Lakarkan litar mudah bagi peranti LED, Diod Foto, Diod Zener dan Diod Schottky. Kemudian, terangkan prinsip pengoperasian peranti tersebut dengan menggunakan perkataan anda sendiri.

[100 MARKS/ MARKAH]

END OF QUESTION PAPER/ KERTAS SOALAN TAMAT