KOLEJ YAYASAN PELAJARAN JOHOR
ONLINE FINAL EXAMINATION

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

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.

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

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 dalam kertas jawapan.*

QUESTION 1/ *SOALAN 1*

a) Explain how the depletion region in a pn junction created.

(3 marks/ *markah*)

b) Define semiconductor and state the differences between conductor and insulator.

(7 marks/ *markah*)

c) Determine I, V_{O1} and V_{O2} for the circuit of **Figure Q1(c)**.

(10 marks/ *markah*)

a) Terangkan bagaimanakah kawasan susutan di simpang pn terjadi.

b) Berikan definisi separuh pengalir dan nyatakan perbezaan di antara pengalir dan penebat.

*c) Tentukan I, V_{O1} dan V_{O2} bagi litar pada **Rajah Q1(c)**.*

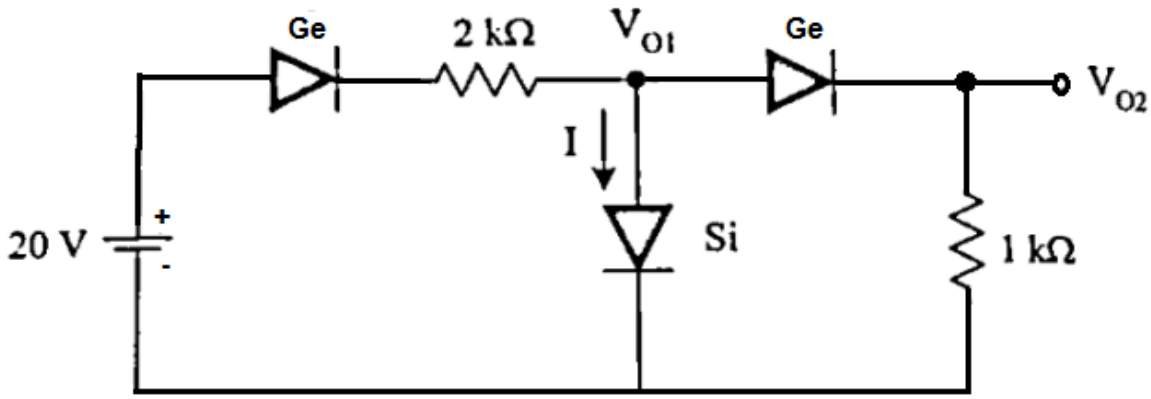


Figure Q1(c) / *Rajah Q1(c)*

QUESTION 2/ *SOALAN 2*

a) Explain how to determine the condition of a semiconductor diode.

(6 marks/ *markah*)

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

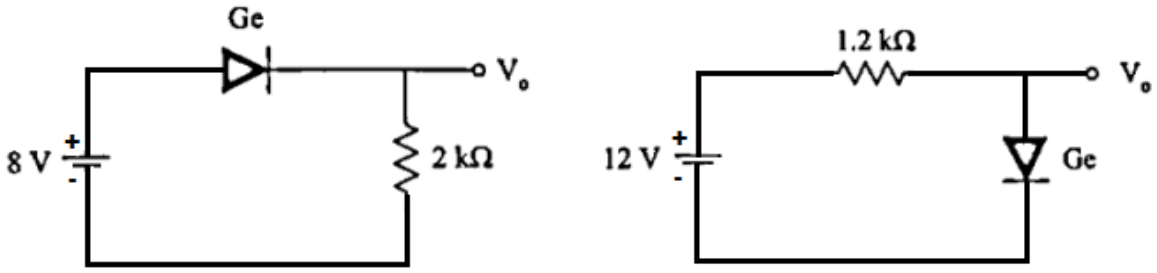
(4 marks/ *markah*)

c) Based on **Figure Q2(c)**, sketch and label the output voltage,Vo with reference to the input,Vin. Show your analysis.

(10 marks/ *markah*)

a) Terangkan bagaimana menentukan keadaan diod separuh pengalir.

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



(i) (ii)

Figure Q2(b) / *Rajah Q2(b)*

*c) Berdasarkan **Rajah Q2(c)**, lakar dan labelkan voltan keluaran,Vo dengan merujuk kepada masukan,Vin. Tunjukkan analisis anda.*

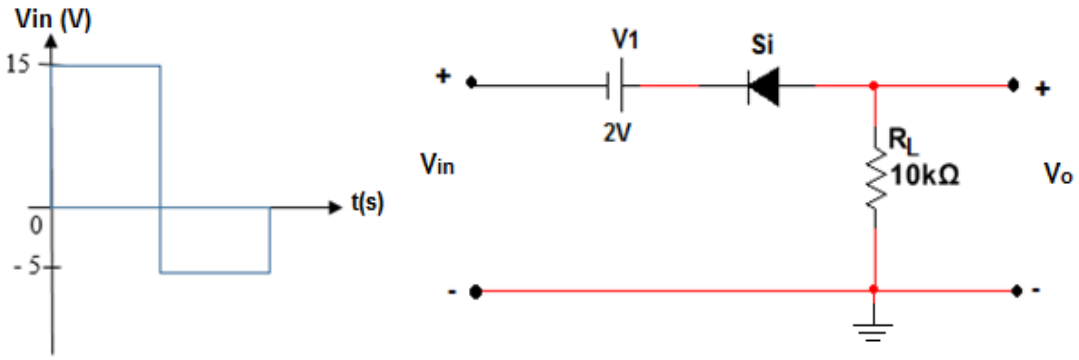


Figure Q2(c) / ***Rajah Q2(c)***

QUESTION 3/ ***SOALAN 3***

a) Based on **Figure Q3(a)**, determine I_B, R_B, V_C, V_E, V_{CE} and V_B.

(11 marks/ ***markah*****)**

b) Given the information appearing in **Figure Q3(b)**, determine :

i) base current, I_B.

ii) collector current, I_C.

iii) collector-emitter voltage, V_{CE}.

iv) base voltage, V_B.

(9 marks/ ***markah*****)**

a) Berdasarkan ***Rajah Q3(a)****, tentukan I_B, R_B, V_C, V_E, V_{CE} dan V_B.*

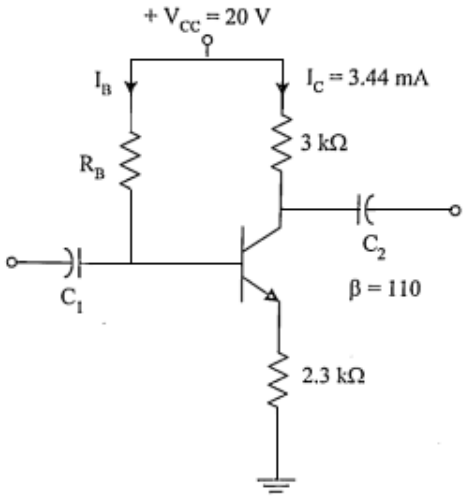


Figure Q3(a) / ***Rajah Q3(a)***

*b) Dengan maklumat yang diberikan dalam litar di **Rajah Q3(b)**, tentukan :*

i) arus tapak, I_B.

ii) arus pemungut, I_C.

iii) voltan pemungut-pemancar, V_{CE}.

iv) voltan tapak, V_B.

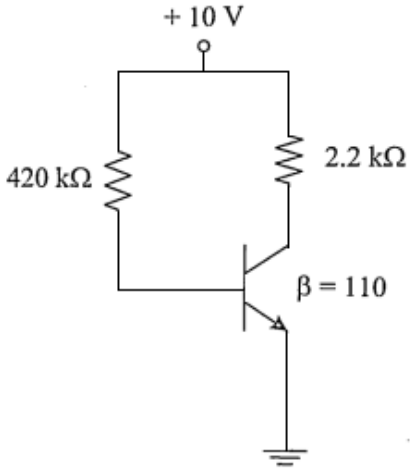


Figure Q3(b) / ***Rajah Q3(b)***

QUESTION 4/ ***SOALAN 4***

Based on **Figure Q4** :

i) Sketch AC equivalent circuit using re model. Given r_e = 6.84Ω, β = 100 and A_{VNL} = -438.6 with assume r_o = ∞.

ii) Sketch the two-port network and determine A_{VL} and A_{VS} using two-port method.

. **(20 marks/** ***markah*****)**

*Merujuk kepada **Rajah Q4** :*

i) Lakarkan litar setara AU dengan menggunakan model re. Diberi r_e = 6.84Ω, β = 100 dan A_{VNL} = -438.6 dengan mengandaikan r_o = ∞.

ii) Lakarkan rangkaian dua-terminal dan tentukan A_{VL} dan A_{VS} dengan menggunakan kaedah dua-terminal.

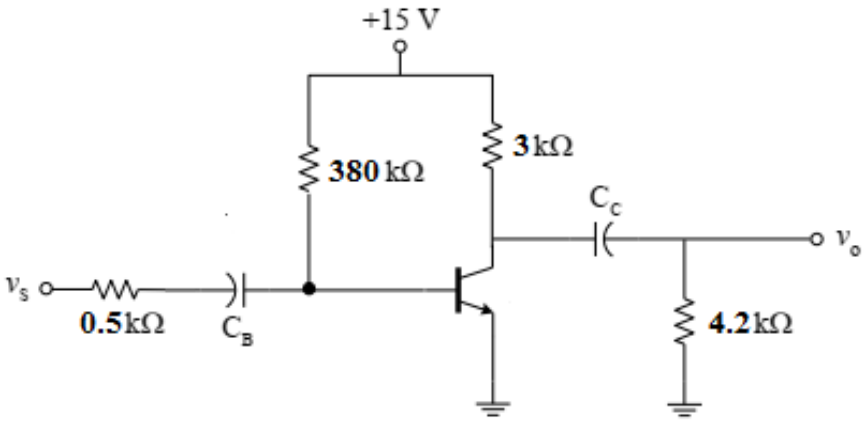


Figure Q4 / ***Rajah Q4***

QUESTION 5/ ***SOALAN 5***

The semiconductor diode is widely used in many areas of electronics today. There are many different types of diode. Diode can be used in many different circuit in many different ways. Suggest where these diodes can be applied.

i) Varactor Diode.
ii) Photo Diode.
iii) Light Emitting Diode (LED).
iv) Zener Diode.

Sketch the circuit and describe their operational principles of each circuit by using your own word.

(20 marks/ ***markah*****)**

Diod separuh pengalir digunakan secara meluas dalam bidang elektronik pada masa kini. Terdapat banyak jenis diod. Diod boleh digunakan dalam pelbagai litar dengan pelbagai cara. Cadangkan dimana diod ini boleh digunakan.

i) Diod Varaktor.
ii) Diod Foto.
iii) Diod Pemancar Cahaya (LED).
iv) Diod Zener

Lakarkan litar dan terangkan prinsip pengoperasian bagi setiap litar dengan menggunakan perkataan anda sendiri.

[100 MARKS/ ***MARKAH*****]**

END OF QUESTION PAPER/ ***KERTAS SOALAN TAMAT***