KOLEJ YAYASAN PELAJARAN JOHOR
ONLINE FINAL EXAMINATION

COURSE NAME	:	**ELECTRONICS 2**
COURSE CODE	:	**DKE 2073**
EXAMINATION	:	**NOVEMBER 2020**
DURATION	:	**6 HOURS**

INSTRUCTION TO CANDIDATES/
ARAHAN KEPADA CALON

1. This examination paper consists of **FOUR (4)** questions. /
    *Kertas soalan ini mengandungi **EMPAT (4)** soalan.*

2. Students are allowed to refer to resources such as lecture notes, books, internet or any other relevant resources. /
    Pelajar dibenarkan merujuk kepada sumber seperti nota kuliah, buku, internet atau mana–mana sumber yang berkaitan.

3. 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).

4. 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.*

5   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.

6.. Answer should be handwritten, neat and clear. /
    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 **7** printed pages including front page
*Kertas soalan ini mengandungi **7** halaman bercetak termasuk muka hadapan*

This examination paper consists of **FOUR (4)** questions. Answer **ALL** the questions in the answer sheet.

*Kertas soalan ini mengandungi **EMPAT (4)** soalan. Jawab **SEMUA** soalan dalam kertas jawapan.*

QUESTION 1/ *SOALAN 1*

a) Referring to **Figure 1(a)**, point out I_{DQ} and V_{GSQ} using transfer curve technique. The graph is given in the **Attachment 1**.

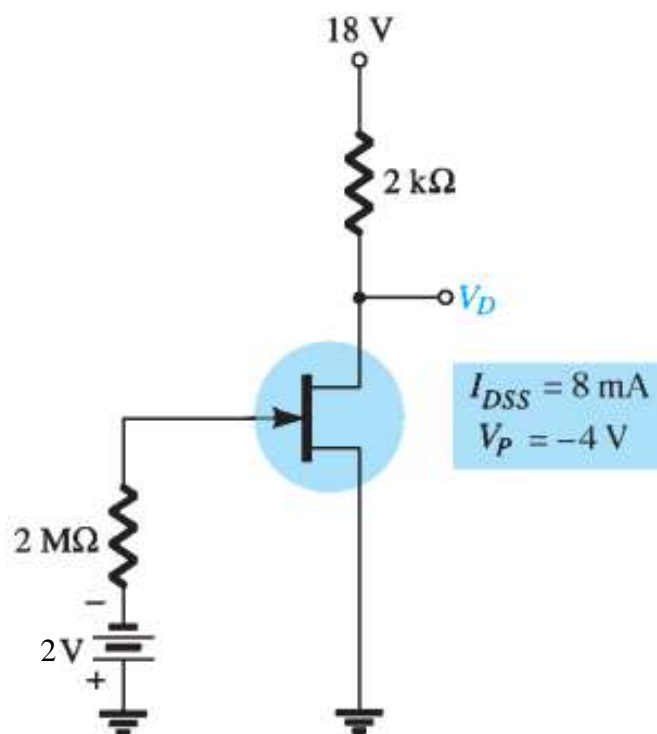*Merujuk kepada **Rajah 1(a)**, tunjukkan I_{DQ} dan V_{GSQ} menggunakan teknik lengkuk pindah. Graf diberi di **Lampiran 1**.*

18 V

2 kΩ

V_D

$I_{DSS} = 8$ mA
$V_P = -4$ V

2 MΩ

2 V

Figure 1(a) / Rajah 1(a)

(15 marks/ markah)

b) Referring to **Figure 1(a)**, identify the values of V_{DS}, V_S, V_G and V_D.

*Merujuk pada **Rajah 1(a)**, kenal pasti nilai V_{DS}, V_S, V_G dan V_D.*

(10 marks/ markah)

QUESTION 2/ *SOALAN 2*

a) Calculate g_{mo} for a JFET having device parameters I_{DSS} = 12mA and Vp = -4V.

   Kirakan g_{mo} untuk JFET yang mempunyai parameter I_{DSS} = 12mA dan Vp = -4V.

(5 marks/ *markah*)

b) Referring to **Figure 2(b)**, determine Zi, Zo, and Av. Given I_{DSS} = 10mA, Vp = -6V, and rd = 40kΩ.

   *Merujuk kepada **Rajah 2(b)**, tentukan Zi, Zo, dan Av. Given I_{DSS} = 10mA, Vp = -6V, dan rd = 40kΩ.*
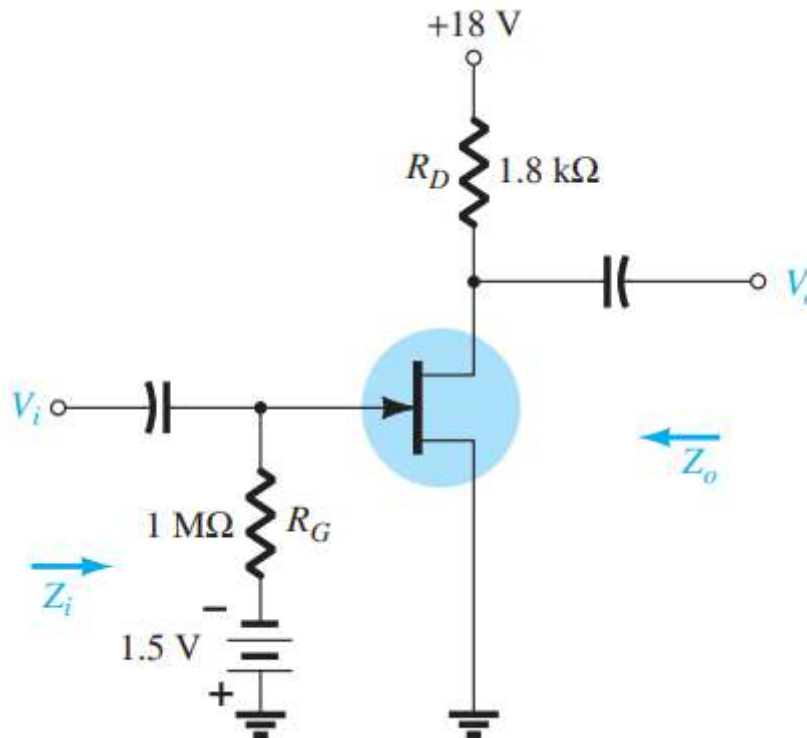

Figure 2(b) / *Rajah 2(b)*

(20 marks/ *markah*)

QUESTION 3/ SOALAN 3

a) Calculate the CMRR (in dB) for the circuit measurements of Vd = 1mV, Vo = 120 mV, V_C = 1mV, and Vo = 20µV.

Kirakan CMRR (dalam dB) bagi ukuran litar Vd = 1mV, Vo = 120 mV, V_C = 1mV, dan Vo = 20µV.

(8 marks/ *markah*)

b) Calculate the output voltage for **Figure 3(b)** below. Given V_1 = 50 sin(1000t) mV and V_2 = 10 sin(3000t) mV.

*Kirakan voltan keluaran bagi **Rajah 3(b)** di bawah. Diberi V_1 = 50 sin(1000t) mV dan V_2 = 10 sin(3000t) mV.*
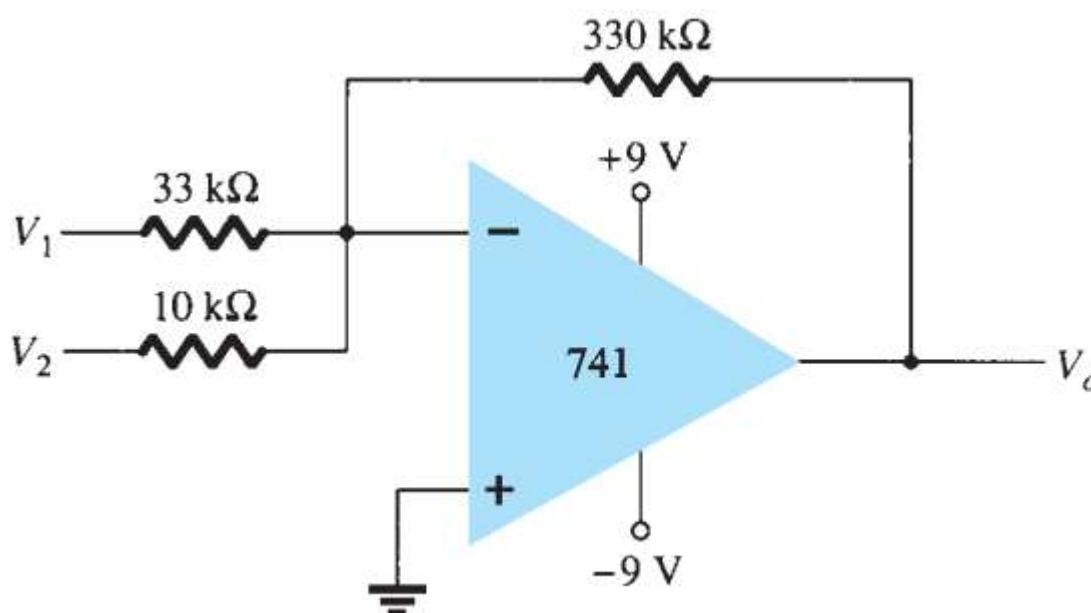

Figure 3(b) / Rajah 3(b)

(5 marks/ *markah*)

c) Referring to the op-amp circuit in **Figure 3(c)**, calculate the output voltage, V_o. Given V_1 = 12 mV and V_2 = 18mV..

*Merujuk kepada litar penguat kendalian dalam **Rajah 3(c)**, kirakan voltan keluaran, V_o. Diberi V_1 = 12 mV dan V_2 = 18mV..*
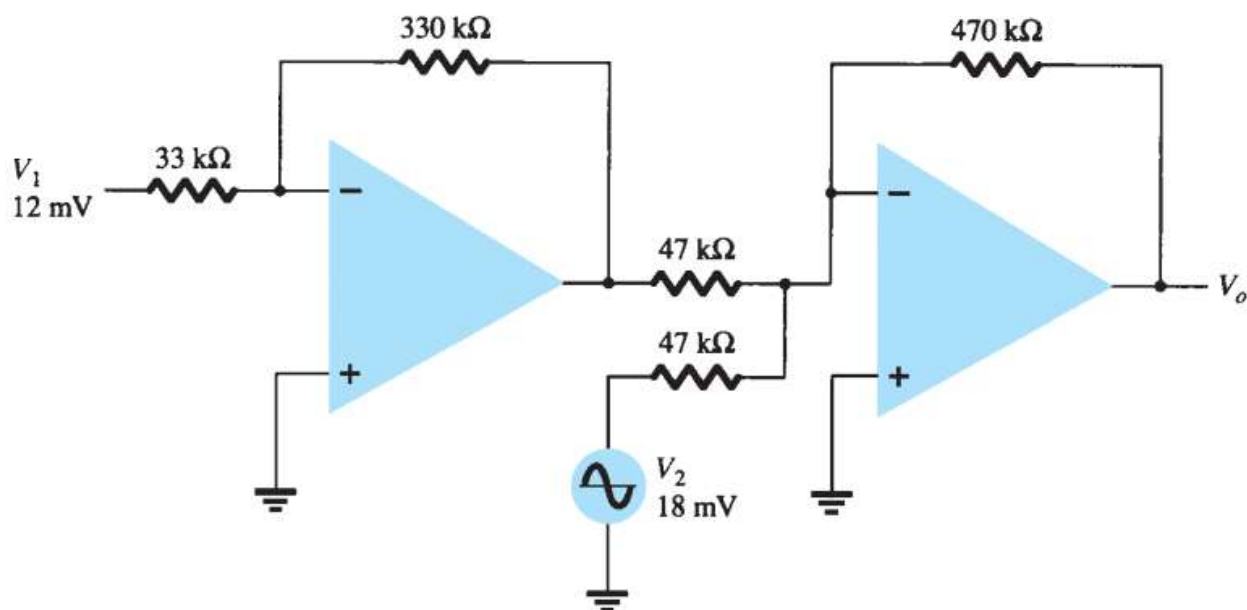
Figure 3(c) / Rajah 3(c)

(12 marks/ markah)

QUESTION 4/ SOALAN 4

Based on Class B Power Amplifier in **Figure 4**, calculate :

  a) The peak input voltage, Vi(p)

  b) The peak voltage across the load, $V_L(p)$

  c) The peak load current, $I_L(p)$

  d) The direct current, I_{DC}

  e) The input power, $P_{in(dc)}$

  f) The output power, $P_{o(ac)}$

  g) The power dissipated by each output transistor, P_Q

  h) The circuit efficiency, %η

  i) The maximum input power, $P_{in(max)}$

  j) The maximum output power, $P_{o(max)}$

*Berdasarkan litar Penguat Kuasa Kelas B dalam **Rajah 4**. Kirakan:*

  a) *Voltan puncak pada masukan, $V_{i(p)}$*

  b) *Voltan puncak pada beban, $V_{L(p)}$*

  c) *Arus puncak pada beban, $I_{L(p)}$*

  d) *Arus terus, I_{DC}*

  e) *Kuasa masukan, $P_{in(dc)}$*

f)   *Kuasa keluaran, $P_{o(ac)}$*

g)   *Kuasa yang dilesapkan oleh transistor pada keluaran, P_Q*

h)   *Kecekapan litar, %η*

i)   *Kuasa masukan maksimum $P_{in(max)}$*
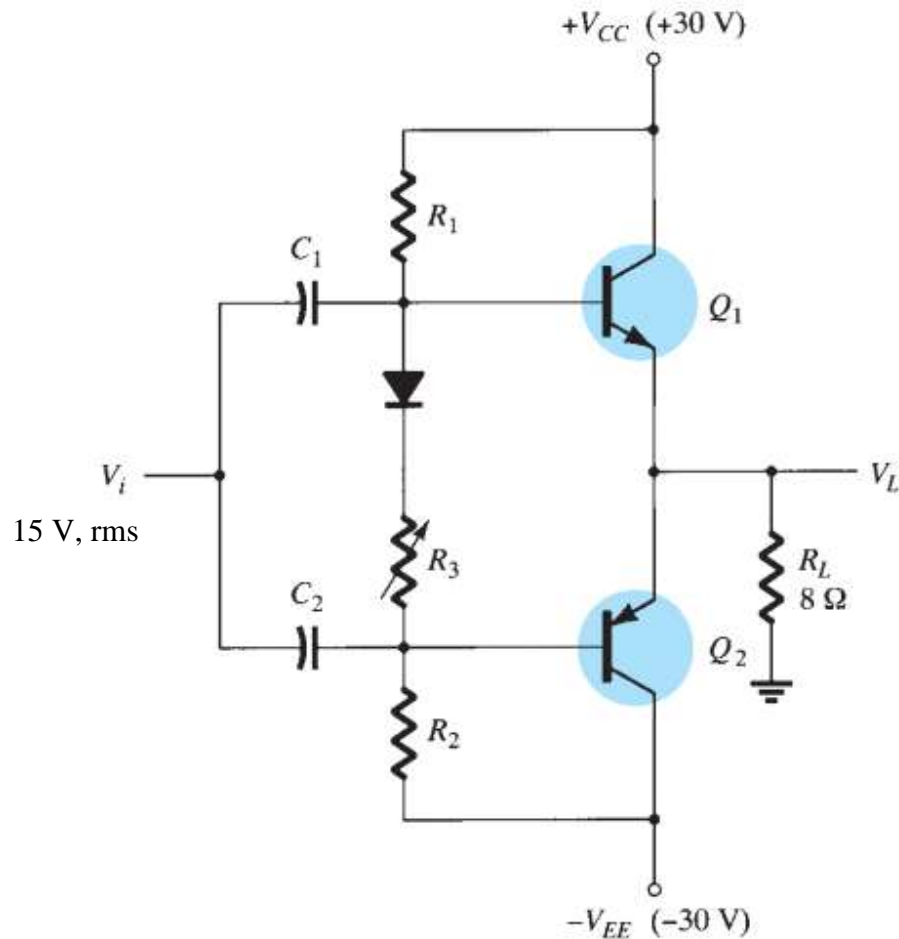
j)   *Kuasa keluaran maksimum $P_{o(max)}$*

Figure 4 / *Rajah 4*

(25 marks/ markah)
[100 MARKS/ *MARKAH*]

END OF QUESTION PAPER/ *KERTAS SOALAN TAMAT*

Attachment 1 / *Lampiran 1*

Name / *Nama*   :..

Lecturer / *Pensyarah*   :..

Attachment 1 / *Lampiran 1*