



**KOLEJ YAYASAN PELAJARAN JOHOR
ONLINE FINAL EXAMINATION**

COURSE NAME : ELECTRONICS 2
COURSE CODE : DKE 2073
EXAMINATION : DECEMBER 2021
DURATION : 2 HOURS 30 MINUTES

**INSTRUCTION TO CANDIDATES/
ARAHAN KEPADA CALON**

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

(15 marks/ markah)

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

(10 marks/ markah)

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

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

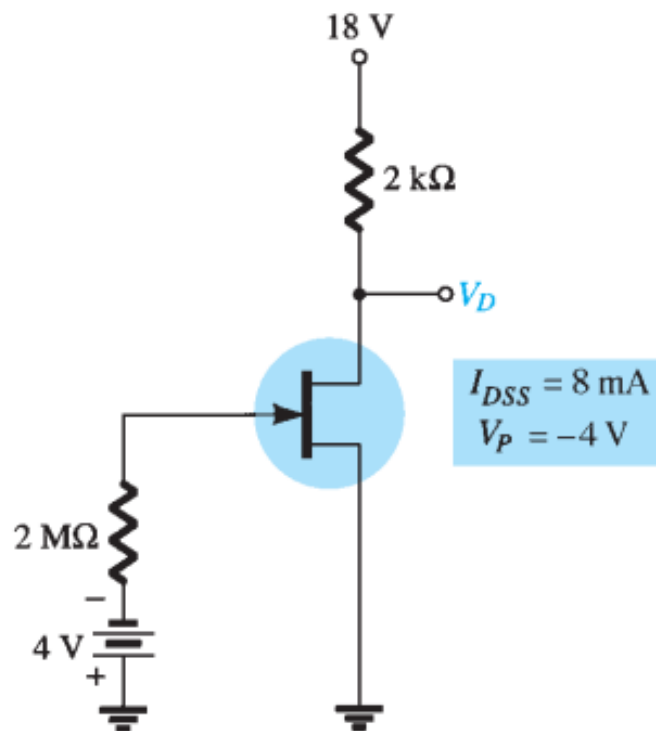


Figure 1 (a) / Rajah 1 (a)

QUESTION 2/ SOALAN 2

- a) Calculate g_{m0} for a JFET having device parameters $I_{DSS} = 12\text{mA}$ and $V_p = -4\text{V}$.

(5 marks/ markah)

- b) Referring to **Figure 2(b)**, determine Z_i , Z_o , and A_v . Given $I_{DSS} = 10\text{mA}$, $V_p = -6\text{V}$, and $r_d = 40\text{k}\Omega$.

(20 marks/ markah)

- a) Kirakan g_{m0} untuk JFET yang mempunyai parameter $I_{DSS} = 12\text{mA}$ dan $V_p = -4\text{V}$.

- b) Merujuk kepada **Rajah 2(b)**, tentukan Z_i , Z_o , dan A_v . Given $I_{DSS} = 10\text{mA}$, $V_p = -6\text{V}$, dan $r_d = 40\text{k}\Omega$.

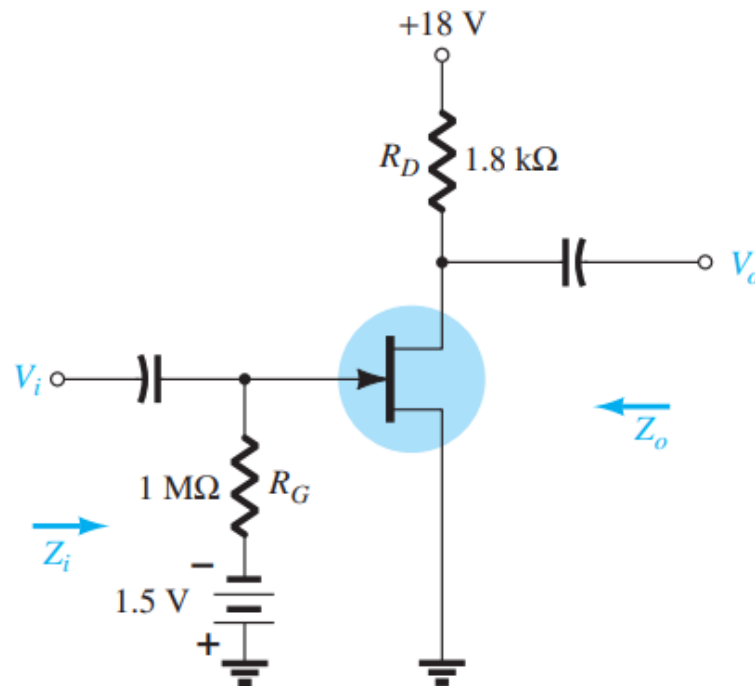


Figure 2 (b) / Rajah 2(b)

QUESTION 3/ SOALAN 3

- a) Calculate the CMRR (in dB) for the circuit measurements of $V_d = 1\text{mV}$, $V_o = 120\text{mV}$, $V_c = 1\text{mV}$, and $V_o = 20\mu\text{V}$.

(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.

(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 $V_2 = 18$ mV..

(12 marks/ markah)

a) Kirakan CMRR (dalam dB) bagi ukuran litar $V_d = 1$ mV, $V_o = 120$ mV, $V_C = 1$ mV, dan $V_o = 20$ μ V.

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

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

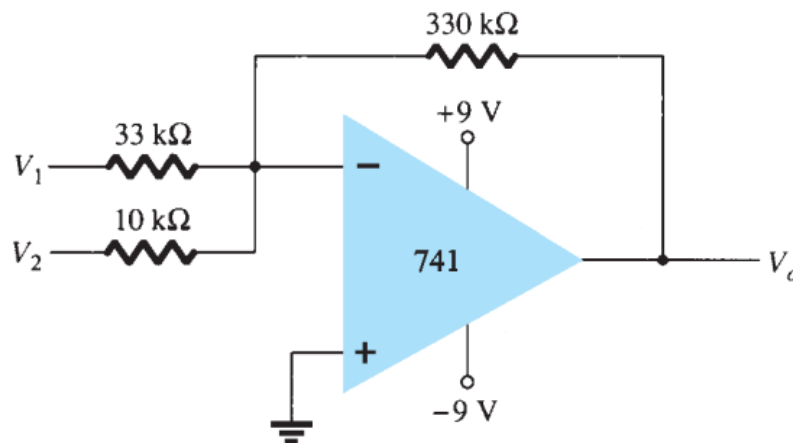


Figure 3 (b) / Rajah 3(b)

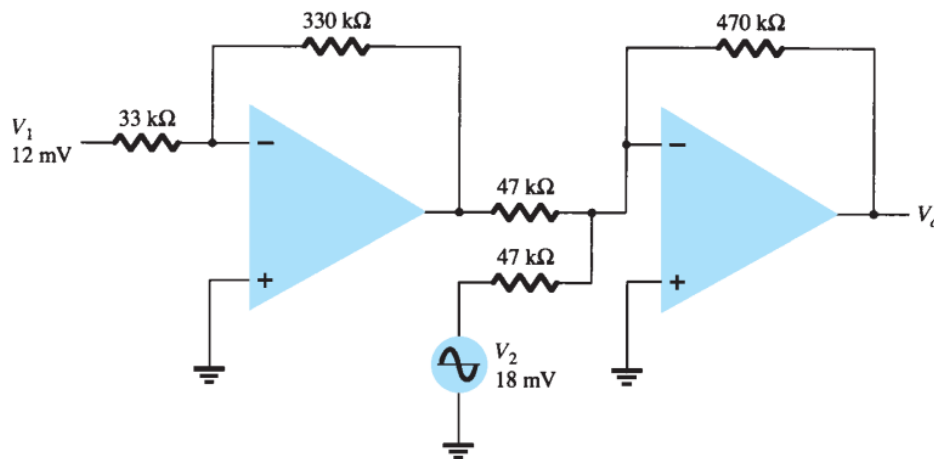


Figure 3(c) / Rajah 3(c)

QUESTION 4/ SOALAN 4

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

- a) The peak input voltage, $V_i(p)$
- 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, $\% \eta$
- 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, $\% \eta$*
- i) *Kuasa masukan maksimum $P_{in(max)}$*
- j) *Kuasa keluaran maksimum $P_{o(max)}$*

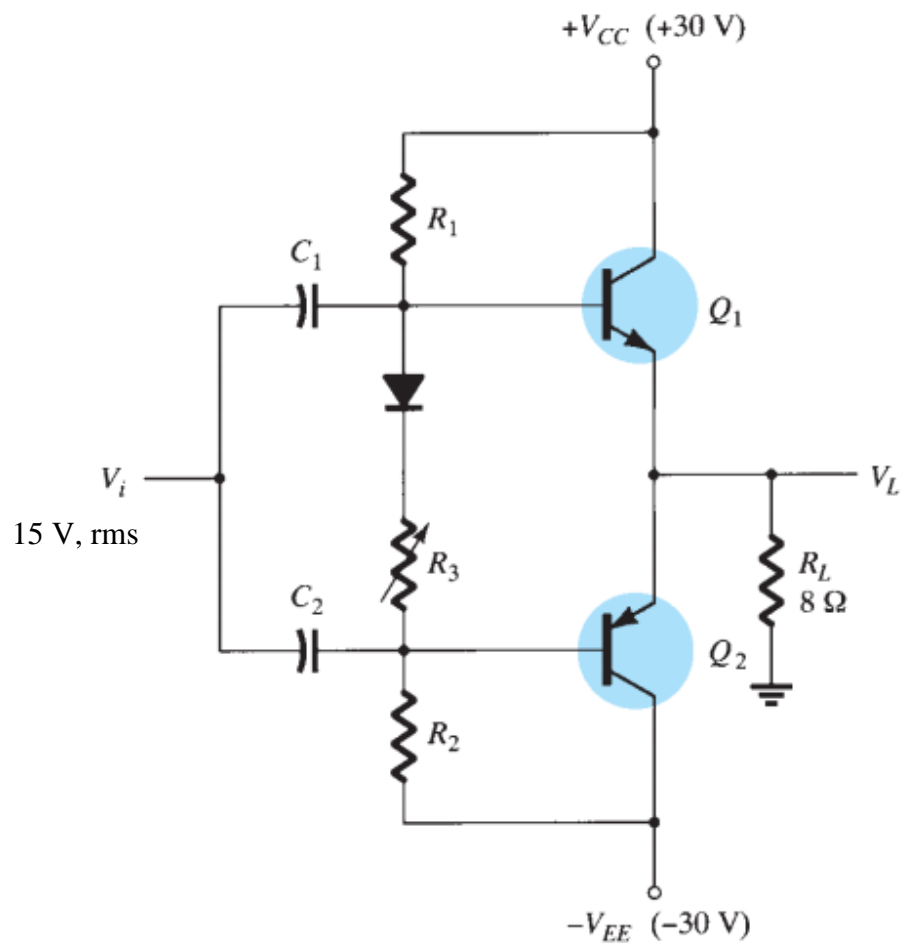


Figure 4 / Rajah 4

(25 marks/ markah)

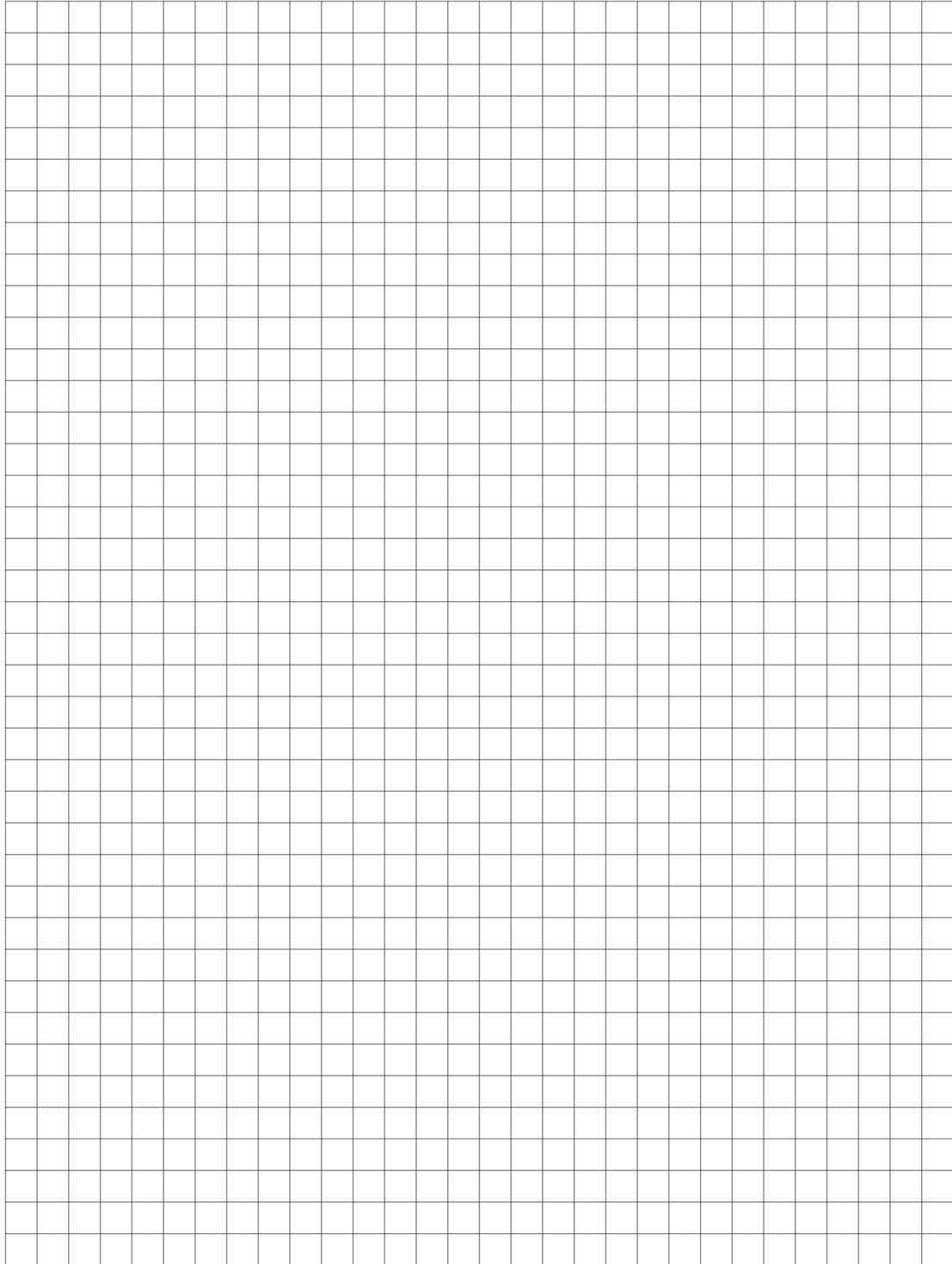
[100 MARKS/ MARKAH]

END OF QUESTION PAPER/ KERTAS SOALAN TAMAT

Attachment 1 / Lampiran 1

Name / Nama :

Lecturer / Pensyarah :



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