



KOLEJ YAYASAN PELAJARAN JOHOR
FINAL EXAMINATION

COURSE NAME : ELECTRONICS 2
COURSE CODE : DKE 2073
EXAMINATION : DECEMBER 2022
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. Candidates are not allowed to bring any material to the examination room except with the permission from the invigilator. The formula was attached at the back of the question paper. /
Calon tidak dibenarkan untuk membawa sebarang bahan/nota ke bilik peperiksaan tanpa arahan/kebenaran daripada pengawas. Rumus dilampirkan di belakang kertas soalan peperiksaan.
3. Please check to make sure that this examination pack consists of: /
Pastikan kertas soalan peperiksaan ini mengandungi:
 - i. Question Paper /
Kertas Soalan.
 - ii. Answering Booklet /
Buku Jawapan.

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** muka surat termasuk kulit hadapan*

This part contains of **FOUR (4)** questions. Answer all **FOUR (4)** questions in the Answering Booklet.

*Bahagian ini mempunyai **EMPAT (4)** soalan. Jawab **SEMUA** soalan di dalam Buku Jawapan.*

QUESTION 1 / SOALAN 1

- a) Construct the symbols of n-channel and p-channel of JFET and MOSFETs.

(CLO1,PLO1,C3,DK1-DK4)

(5 marks / markah)

- b) Construct the transfer curve on the graph paper provided for Figure 1. [Hint: Given $I_{DQ} = 2.8 \text{ mA}$, $V_G = 1.85 \text{ V}$ and $V_D = 10.25 \text{ V}$]

(CLO1,PLO1,C3,DK1-DK4)

(5 marks / markah)

- c) Show the values of R_G , R_D and R_S based on the transfer curve in question (b). [Hint: Given $I_{DQ} = 2.8 \text{ mA}$, $V_G = 1.85 \text{ V}$ and $V_D = 10.25 \text{ V}$]

(CLO1,PLO1,C3,DK1-DK4)

(15 marks / markah)

- a) *Bina simbol JFET dan MOSFET bagi saluran-n dan saluran-p.*
- b) *Bina lengkung pindah untuk **Rajah 1** dalam graf yang telah disediakan. [Petunjuk: Diberikan $I_{DQ} = 2.8 \text{ mA}$, $V_G = 1.85 \text{ V}$ and $V_D = 10.25 \text{ V}$]*
- c) *Tunjukkan nilai R_G , R_D dan R_S berdasarkan lengkung pindah di soalan (b). [Petunjuk: Diberikan $I_{DQ} = 2.8 \text{ mA}$, $V_G = 1.85 \text{ V}$ and $V_D = 10.25 \text{ V}$]*

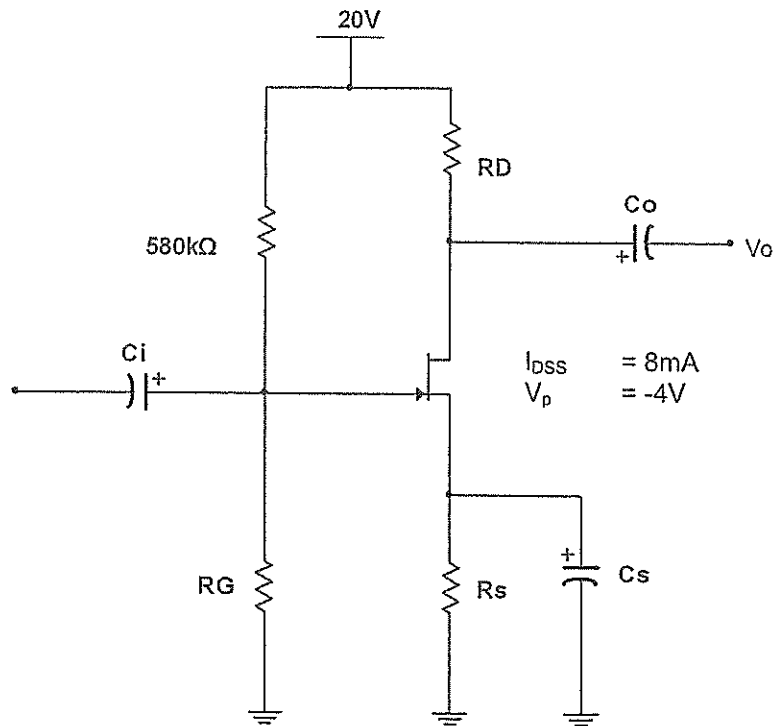


Figure 1 / Rajah 1

QUESTION 2 / SOALAN 2

- a) Sketch the ac equivalent circuit for Figure 2.

(CLO1,PLO1,C3,DK1-DK4)

(5 marks / markah)

- b) Show Z_i , Z_{out} , and A_v for Figure 2.

(CLO1,PLO1,C3,DK1-DK4)

(20 marks / markah)

- a) Lakarkan litar setara au bagi Rajah 2.

- b) Tunjukkan Z_i , Z_{out} , dan A_v bagi Rajah 2.

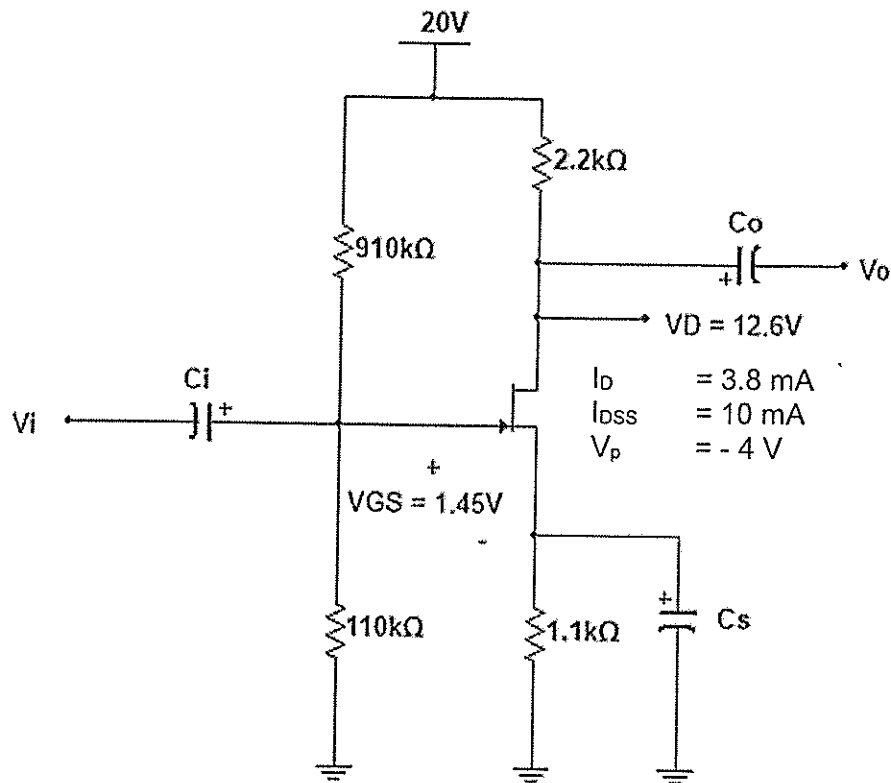


Figure 2/ Rajah 2

QUESTION 3 / SOALAN 3

- a) Sketch the inverting amplifier, non-inverting amplifier, summing amplifier, integrator amplifier and differentiator amplifier.

(CLO2,PLO1,C3,DK1-DK4)

(10 marks / markah)

- b) Show the cut-off frequency, f_c and voltage gain, A_v in dB for circuit in Figure 3 (a).

(CLO2,PLO1,C3,DK1-DK4)

(5 marks / markah)

- c) Solve the values of R_1 , R_2 and R_A for circuit in Figure 3 (b). Given an output expression for a voltage, $V_0 = 6 V_1 + 4 V_2$.

(CLO2,PLO1,C3,DK1-DK4)

(10 marks / markah)

- a) Lakarkan penguat penyongsang, penguat tak penyongsang, penguat penambah, penguat pengamiran dan penguat pembezaan.
- b) Tunjukan frekuensi potong, f_c dan gandaan voltan, A_v dalam dB bagi litar dalam Rajah 3 (a).
- c) Selesaikan nilai R_1 , R_2 dan R_A bagi litar dalam Rajah 3 (b). Diberi ungkapan voltan keluaran $V_0 = 6 V_1 + 4 V_2$.

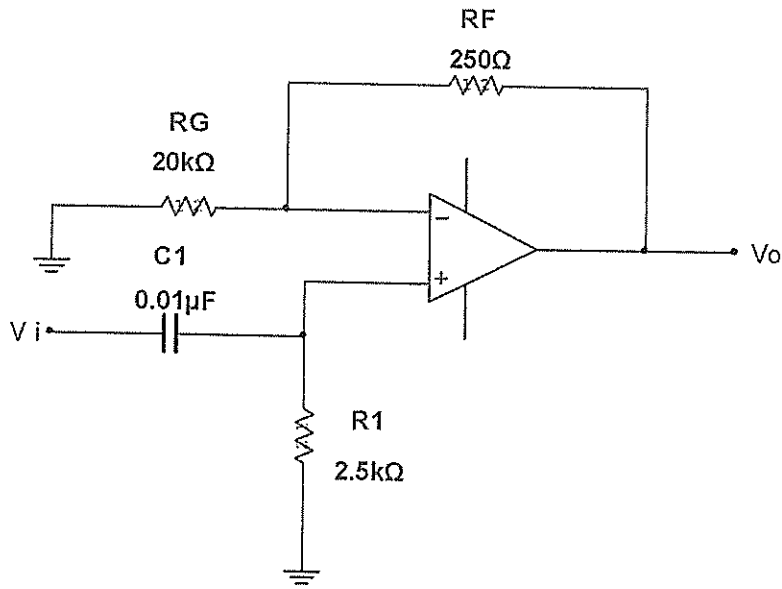


Figure 3 (a)/ Rajah 3(a)

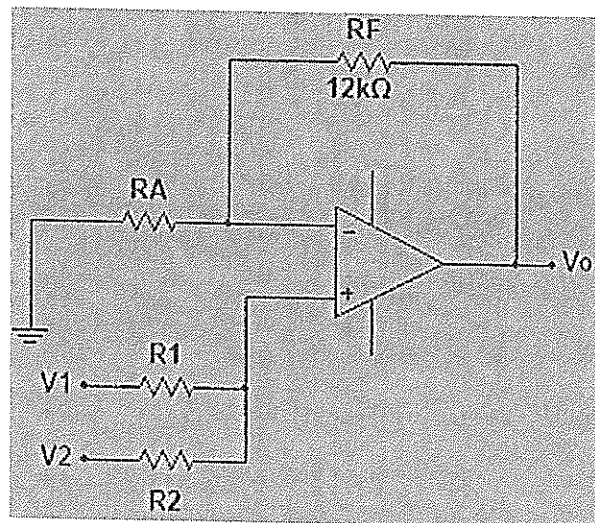


Figure 3 (b)/ Rajah 3(b)

QUESTION 4 / SOALAN 4

- a) Show the the input power, output power, and circuit efficiency for a class B amplifier using providing a 20 –V peak signal to a load 16Ω (speaker) and power supply of $V_{cc} = 30 \text{ V}$.

(CLO3,PLO2,C3,DK1-DK4)

(10 marks / markah)

- b) Show the input power, output power, and power handled by each output transistor and the circuit efficiency for an input of 12 V rms for Figure 4 (a).

(CLO3,PLO2,C3,DK1-DK4)

(15 marks / markah)

- a) *Tunjukkan kuasa masukan, kuasa keluaran, dan kecekapan litar untuk penguat kelas B dengan menyediakan isyarat puncak 20 – V kepada beban 16Ω (pembesar suara) dan bekalan kuasa, $V_{cc} = 30 \text{ V}$.*

- b) *Tunjukkan kuasa masukan, kuasa keluaran, dan kuasa yang dikendalikan oleh setiap transistor serta kecekapan litar bagi masukan 12 V rms pada Rajah 4 (a).*

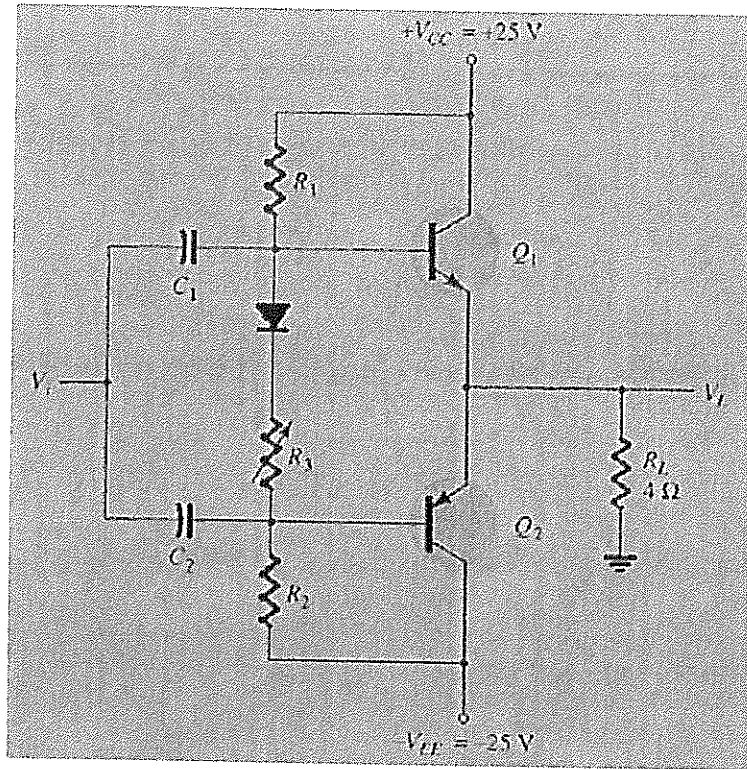


Figure 4 / Rajah 4

[100 MARKS / MARKAH]

END OF QUESTION PAPER/ KERTAS SOALAN TAMAT

