KOLEJ YAYASAN PELAJARAN JOHOR

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FINAL EXAMINATION

COURSE NAME	:	**ELECTRONICS 2**
COURSE CODE	:	**DKE 2073**
EXAMINATION	:	**OCTOBER 2019**
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 examination room except with the permission from the invigilator. The graph paper was attached at the back question paper. /
   Calon tidak dibenarkan untuk membawa sebarang bahan/nota ke bilk peperiksaan tanpa arahan/kebenaran daripada pengawas. Kertas graf dilampirkan di belakang kertas soalan peperiksaan.

3. Please check to make sure that this examination pack consist of: /
   Pastikan kertas soalan peperiksaan ini mengandungi:

   i. Question paper /
      Kertas soalan

   ii. Answer 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 8 printed pages including front page
Kertas soalan ini mengandungi 8 muka surat termasuk kulit hadapan

This part contains of **FOUR(4)** questions. Answer **ALL** questions in Answer Booklet.
*Bahagian ini mengandungi **EMPAT (4)** soalan. Jawab **SEMUA** soalan di dalam buku jawapan yang disediakan.*

QUESTION 1/ *SOALAN 1*

a. Determine the I_{DQ} and V_{GSQ} for **Figure Q1 (a)** below using transfer curve technique. The graph is given in the Attachment 1.

*Tentukan I_{DQ} dan V_{GSQ} untuk **Rajah Q1 (a)** di bawah menggunakan teknik lengkuk pindah. Graf diberi di Lampiran 1.*

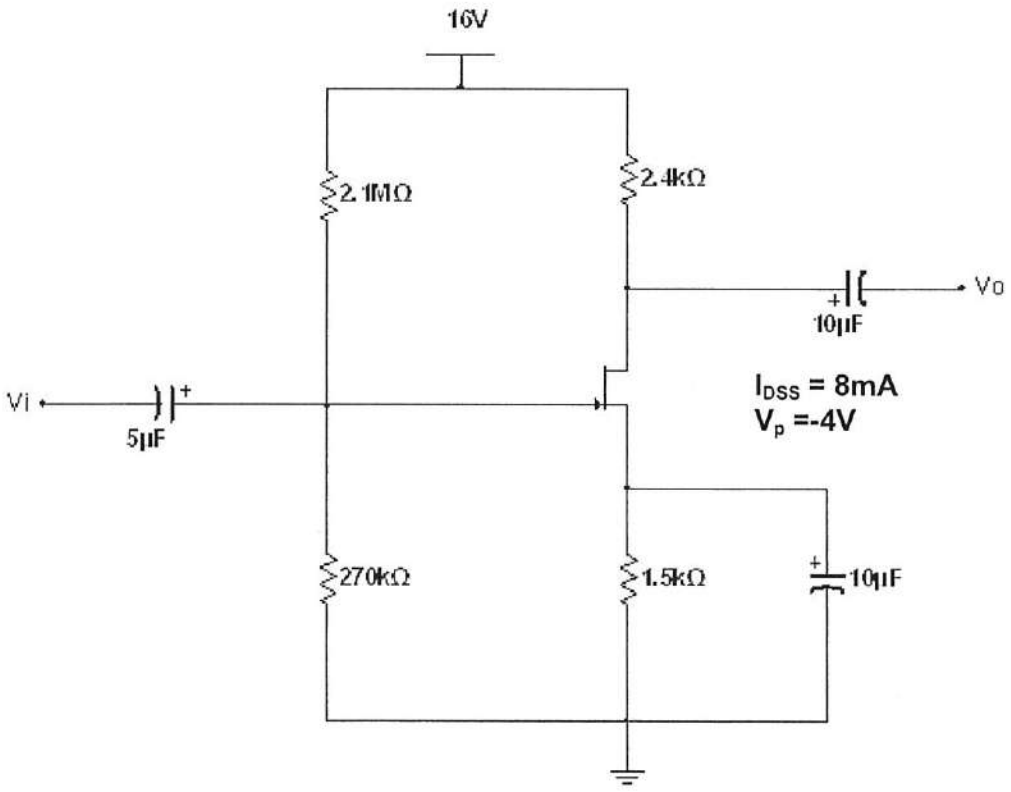

Figure Q1 (a)/ *Rajah Q1 (a)*

(15 marks/*markah*)

b. Referring to **Figure Q1 (a)**, calculate the values of V_D, V_S, and V_{DS}.

*Merujuk pada **Rajah Q1 (a)**, kirakan nilai bagi V_D, V_S, dan V_{DS}.*

(10 marks/*markah*)

QUESTION 2/ *SOALAN 2*

a. Referring to **Figure Q2 (a)**, determine g_m, r_d, z_i, z_o, and A_V. Given I_{DSS} = 10mA, V_p = -8V, V_{GSQ} = -2V, I_{DQ} = 5.625mA, y_{os} = 40µS.

*Merujuk pada **Rajah Q2 (a)**, tentukan nilai bagi g_m, r_d, z_i, z_o, dan A_V. Diberi I_{DSS} = 10mA, V_p = -8V, V_{GSQ} = -2V, I_{DQ} = 5.625mA, y_{os} = 40µS.*

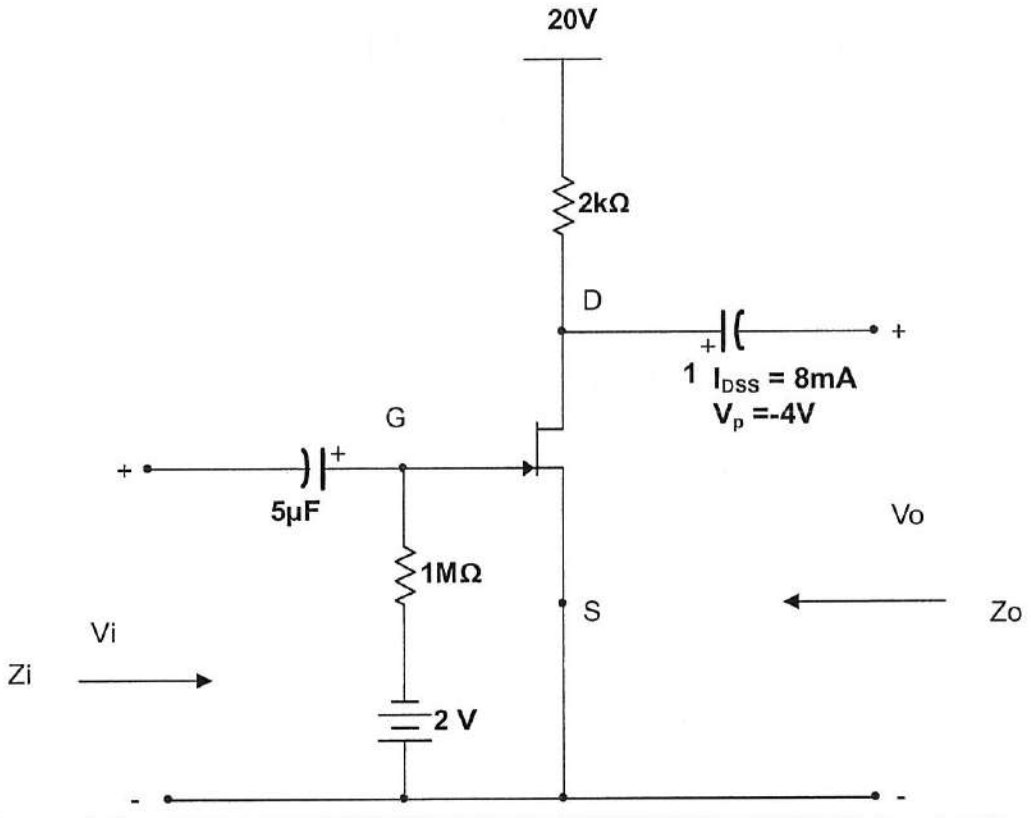

Figure Q2 (a)/ *Rajah Q2 (a)*

(18 marks/*markah*)

b. Determine V_{DS} value for the network of **Figure Q2 (b)** below.

Tentukan nilai V_{DS} *bagi* ***Rajah Q2 (b)*** *di bawah.*

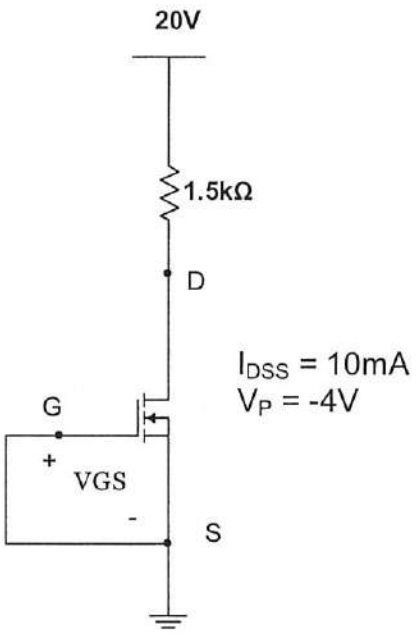

Figure Q2 (b)/ ***Rajah Q2 (b)***

(7 marks/*markah*)

QUESTION 3/ ***SOALAN 3***

a. Calculate the CMRR (in dB) for the circuit measurements of V_d = 1mV, V_o = 12mV and V_c = 1mV, V_o = 20μV.

Kirakan CMRR (dalam dB) bagi litar pengukuran V_d = 1mV, V_o = 12mV and V_c = 1mV, V_o =20μV.

(8 marks/*markah*)

b. Calculate the output voltage for **Figure Q3 (b)** below.
Given $V_1 = 0.05 \sin 1000t$ V and $V_2 = 0.01 \sin 3000t$ V.

Kirakan voltan keluaran bagi Rajah Q3 (b) di bawah.
Diberi $V_1 = 0.05 \sin 1000t$ V dan $V_2 = 0.01 \sin 3000t$ V.

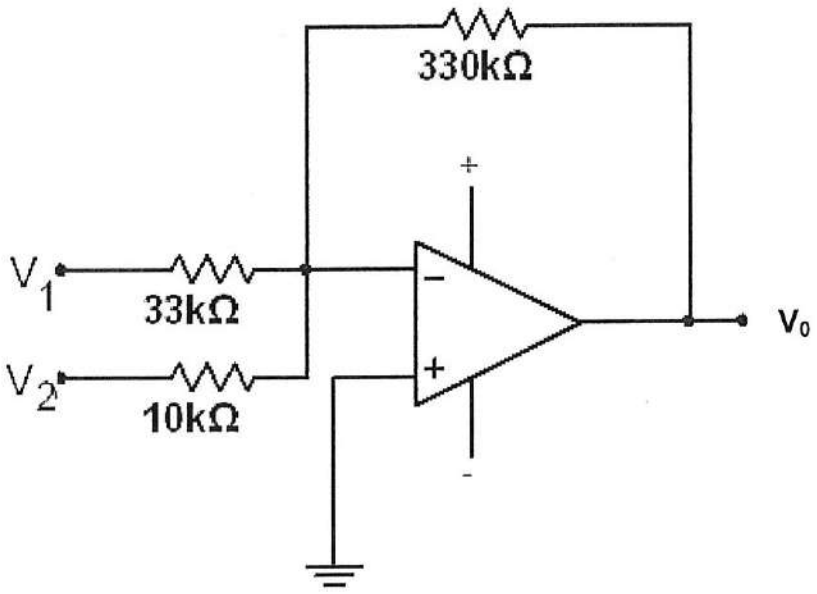

Figure Q3 (b)/ *Rajah Q3 (b)*

(5 marks/*markah*)

c. Referring to the op-amp circuit in **Figure Q3 (c)** below, calculate the value of V_{o1}, V_{o2} and V_{o3}. Given $V_1 = 1$V, $V_2 = 2$V and $V_3 = -2.4$V.

Merujuk kepada litar penguat kendalian dalam ***Rajah Q3 (c)*** *di bawah, kirakan nilai bagi* V_{o1}, V_{o2} *and* V_{o3}. *Diberi* $V_1 = 1V$, $V_2 = 2V$ *dan* $V_3 = -2.4V$.

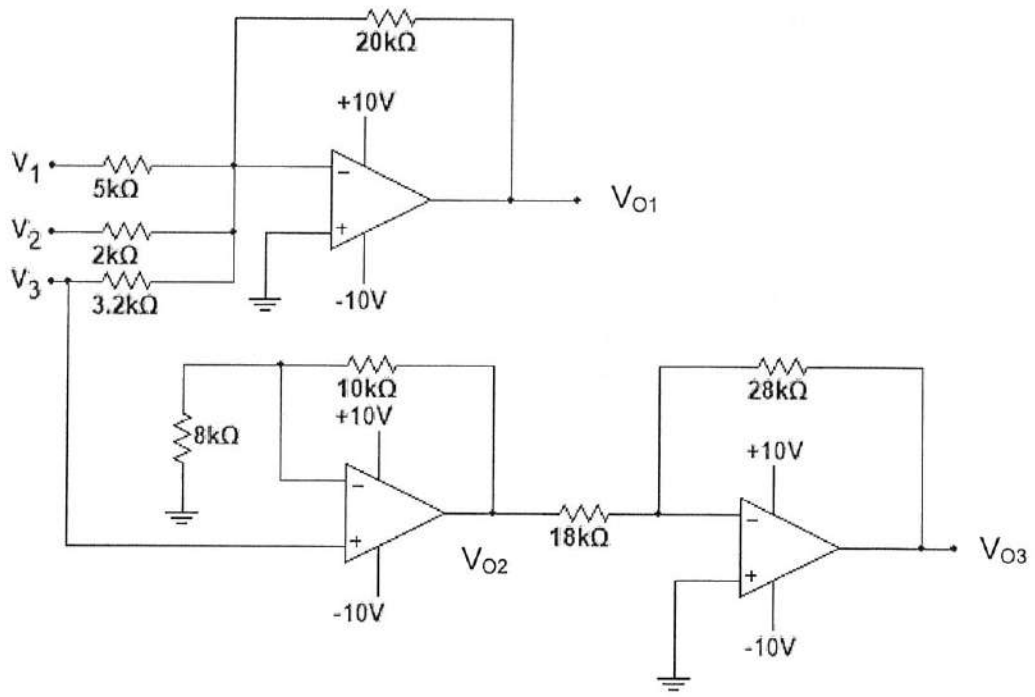

Figure Q3 (c)/ ***Rajah Q3 (c)***

(12 marks/*markah*)

QUESTION 4/ ***SOALAN 4***

Figure Q4 (a) is Class B Power Amplifier. Calculate:

i. the peak input voltage, $V_i(p)$
ii. the peak voltage across the load, $V_L(p)$
iii. the peak load current, $I_L(p)$
iv. the direct current, I_{DC}
v. the input power, $P_{in(dc)}$
vi. the output power, $P_{o(ac)}$
vii. the power dissipated by each output transistor, P_Q,
viii. the circuit efficiency, %η
ix. the maximum input power, $P_{in(max)}$ and
x. the maximum output power, $P_{o(max)}$

Rajah Q4 (a) *ialah Penguat Kuasa Kelas B. Kirakan:-*

i. voltan puncak pada masukan, $V_i(p)$
ii. voltan puncak pada beban , $V_L(p)$
iii. arus puncak pada beban, $I_L(p)$
iv. arus terus, I_{DC}
v. kuasa masukan, $P_{in(dc)}$
vi. kuasa keluaran, $P_{o(ac)}$
vii. kuasa yang dilesapkan oleh transistor pada keluaran, P_Q
viii. kecekapan litar, %η
ix. kuasa masukan maksimum $P_{in(max)}$ dan
x. kuasa keluaran maksimum, $P_{o(max)}$

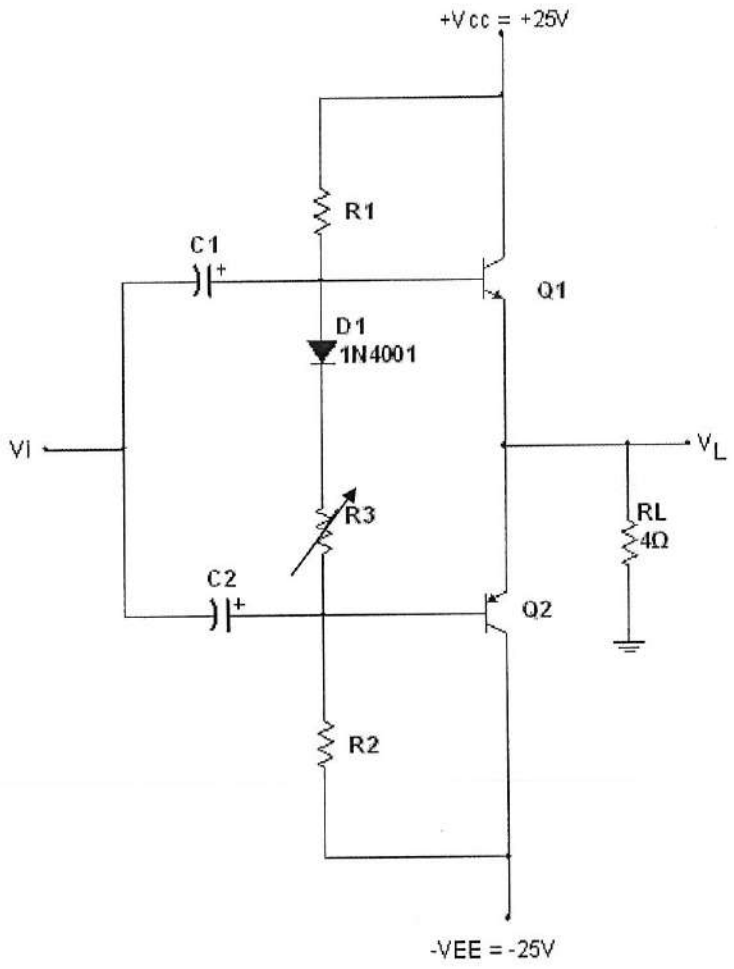

Figure Q4 (a)/ *Rajah Q4 (a)*

(25 marks/*markah*)

[100 MARKS / *MARKAH*]

END OF QUESTION PAPER/*KERTAS SOALAN TAMAT*

Attachment 1/*Lampiran 1*

Name / *Nama* : _____

Lecturer / Pensyarah : _____