
UNIVERSITI SAINS MALAYSIA

Peperiksaan Akhir
Sidang Akademik 2007/2008

April 2008

JEE 342 – ELEKTRONIK ANALOG II

Masa: 3 jam

Sila pastikan bahawa kertas peperiksaan ini mengandungi LIMA muka surat yang bercetak sebelum anda memulakan peperiksaan ini.

Kertas soalan ini mengandungi ENAM soalan.

Jawab LIMA soalan.

Mulakan jawapan anda untuk setiap soalan pada muka surat yang baru.

Agihan markah bagi setiap soalan diberikan di sudut sebelah kanan soalan berkenaan.

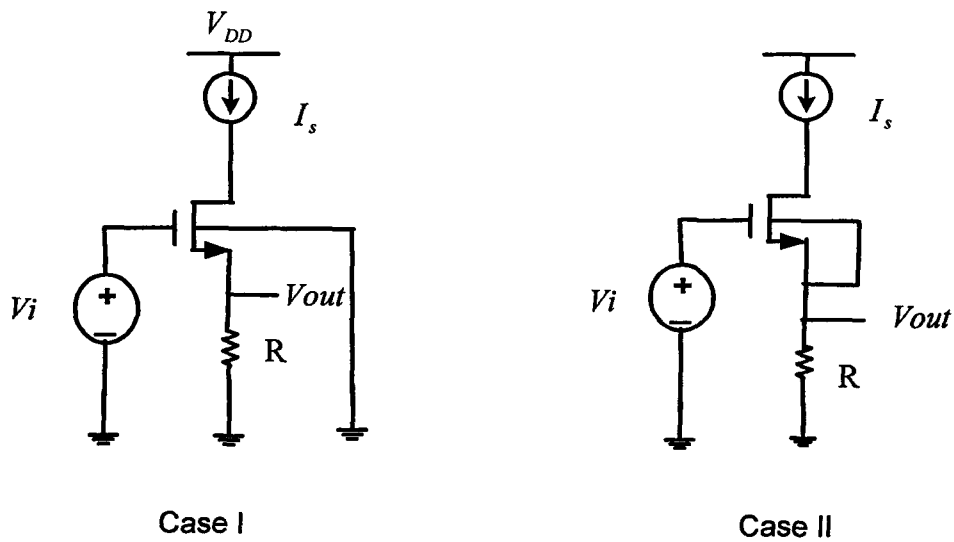
Jawab semua soalan dalam bahasa Malaysia atau bahasa Inggeris.

1. Terangkan operasi transistor MOSFET di dalam kawasan berikut.

Explain transistor operation MOSFET in the following regions.

(a) Tepu
Saturation (10 marks)

(b) Linear
Triode (10 marks)



Rajah 1
Figure 1

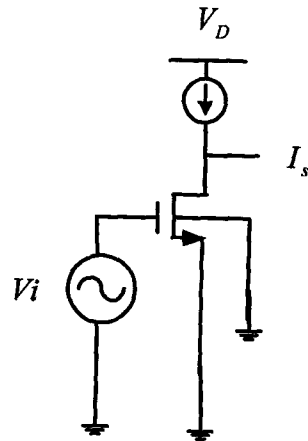
2. Litar di atas berkonfigurasi pengikut punca. Jika pukal disambung ke bumi bagi kes 1 dan pukal disambung ke sumber bagi kes 2, terangkan

The circuit above is in the source follower configuration. If the bulk is connected to ground such as shown in case I and if the bulk is connected to source such as shown in case II, explain

(i) V_{th} (10 marks)

(ii) Arus saluran
Drain current (10 marks)

3.

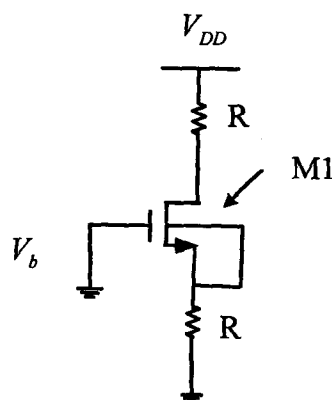


Rajah 3
Figure 3

NMOS dalam Rajah 3 mempunyai konfigurasi punca sepunya. Kira
The NMOS in Figure 3 is in the common source configuration. Calculate

- (a) Gandaan
Gain (10 marks)
- (b) Rintangan masukan
Input resistance (10 marks)

4.



Rajah 4
Figure 4

V_{th} bagi transistor dalam Rajah 4 ialah 0.45V. V_{dd} adalah 1.8V $k = 100 \mu A/V^2$ dan $W/L = 5$.

V_{th} of the transistor in Figure 4 is 0.45V. V_{dd} is 1.8V $k = 100 \mu A/V^2$ and $W/L = 5$.

(a) Cari V_{b_1} jika M1 di dalam kawasan tepu.

Find V_{b_1} if M1 is operating in the saturation region.

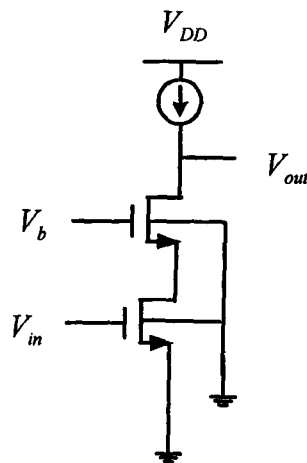
(10 marks)

(b) Kirakan arus saliran.

Calculate the drain current.

(10 marks)

5.



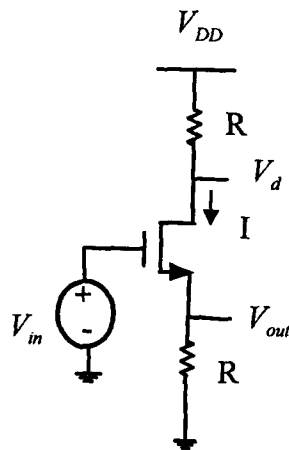
Rajah 5
Figure 5

Beri persamaan gandaan $\frac{V_{out}}{V_{in}}$.

Give gain expression $\frac{V_{out}}{V_{in}}$.

(20 marks)

6.



Rajah 6
Figure 6

(a) Cari persamaan bagi V_{out} .

Find the expressions for V_{out} .

(10 marks)

(b) Cari nilai DC bagi V_d jika $I = 1mA$, $R = 1k\Omega$ dan $V_{dd} = 2.5V$.

Find DC value of V_d if $I = 1mA$, $R = 1k\Omega$ and $V_{dd} = 2.5V$.

(10 marks)

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