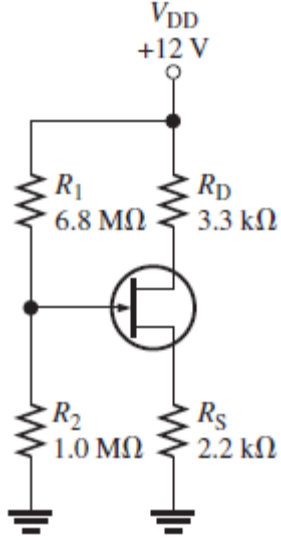


Electronic Circuits II – Assignment 04

| # | Student ID | Student Name | Grade (10) |
|---|------------|--------------|---------------|
| - | | | |

| | |
|---------------|--|
| Delivery Date | |
|---------------|--|

| |
|---|
| <p>١. يتم تسليم التمرين محلولا في خلال أسبوع من تاريخ التمرين، و يتم حذف درجتين من التمرين عن كل أسبوع تأخير ٢. يتم التسليم لمعيد المقرر مباشرة ٣. تتم أجابه التمرين في نفس ورق الأسئلة</p> |
|---|

| # | Question | Answer |
|---|---|--------|
| 1 |  <p>If the value of R_2 in Figure is decreased, V_G will (a) increase (b) decrease (c) not change</p> | |
| 2 | <p>In a self-biased JFET, the gate is at (a) a positive voltage (b) 0 V (c) a negative voltage (d) ground</p> | |
| 3 | <p>To be used as a variable resistor, a JFET must be (a) an n-channel device (b) a p-channel device (c) biased in the ohmic region (d) biased in saturation</p> | |
| 4 | <p>When a JFET is biased at the origin, the ac channel resistance is determined by (a) the Q-point values (b) V_{GS} (c) the transconductance (d) answers (b) and (c)</p> | |



FACULTY OF ENGINEERING
AHRAM CANADIAN UNIVERSITY

كلية الهندسة

Faculty of Engineering



جامعة الأحرام الكندية
AHRAM CANADIAN UNIVERSITY

Q3

Using Equation _____, plot the transfer characteristic curve for a JFET with $I_{DSS} = 8 \text{ mA}$ and $V_{GS(off)} = -5 \text{ V}$. Use at least four points.

$$I_D \cong I_{DSS} \left(1 - \frac{V_{GS}}{V_{GS(off)}} \right)^2$$

So
13

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....



Q5

$I_{DSS} = 20 \text{ mA}$ and $V_{GS(off)} = -6 \text{ V}$ for a particular JFET.

(a) What is I_D when $V_{GS} = 0 \text{ V}$?

(b) What is I_D when $V_{GS} = V_{GS(off)}$?

(c) If V_{GS} is increased from -4 V to -1 V , does I_D increase or decrease?

Sol

5

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

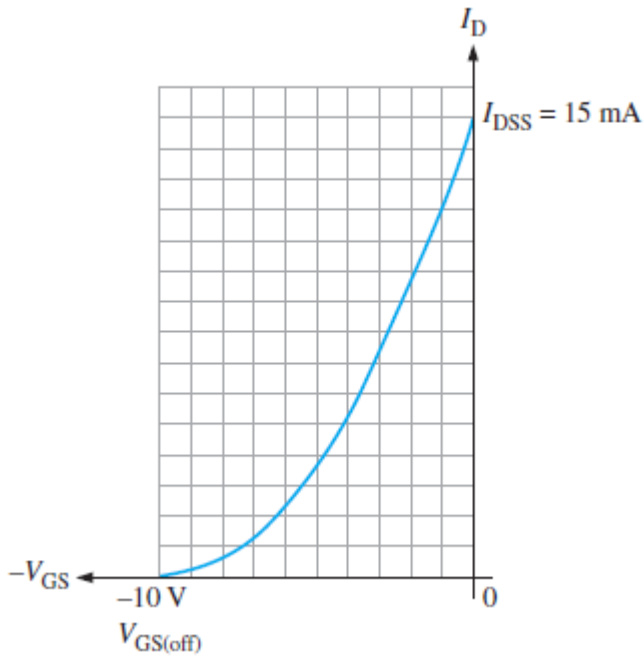
.....

.....



FACULTY OF ENGINEERING
AHRAM CANADIAN UNIVERSITY

Q6



Using the curve in Figure , determine the value of R_S required for a 9.5 mA drain current.

Sol
6

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....



كلية الهندسة

Faculty of Engineering

FACULTY OF ENGINEERING
AHRAM CANADIAN UNIVERSITY



جامعة الأهرام الكندية
AHRAM CANADIAN UNIVERSITY

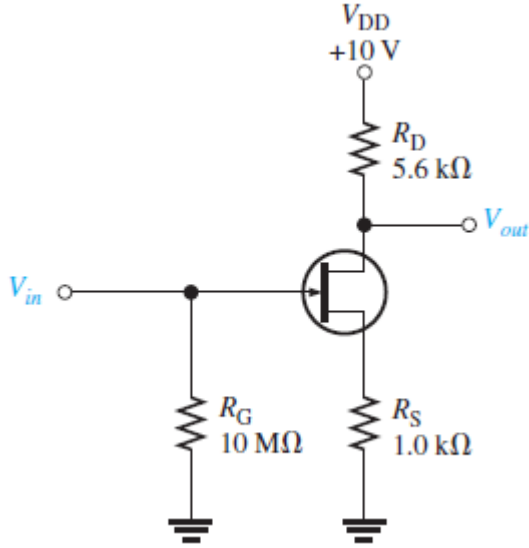
A large rectangular area with a vertical margin on the left and horizontal dotted lines for writing.



Q7

Determine the total input resistance in Figure

$I_{GSS} = 20 \text{ nA}$ at $V_{GS} = -10 \text{ V}$.



Sol
7

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....



كلية الهندسة

Faculty of Engineering

FACULTY OF ENGINEERING
AHRAM CANADIAN UNIVERSITY



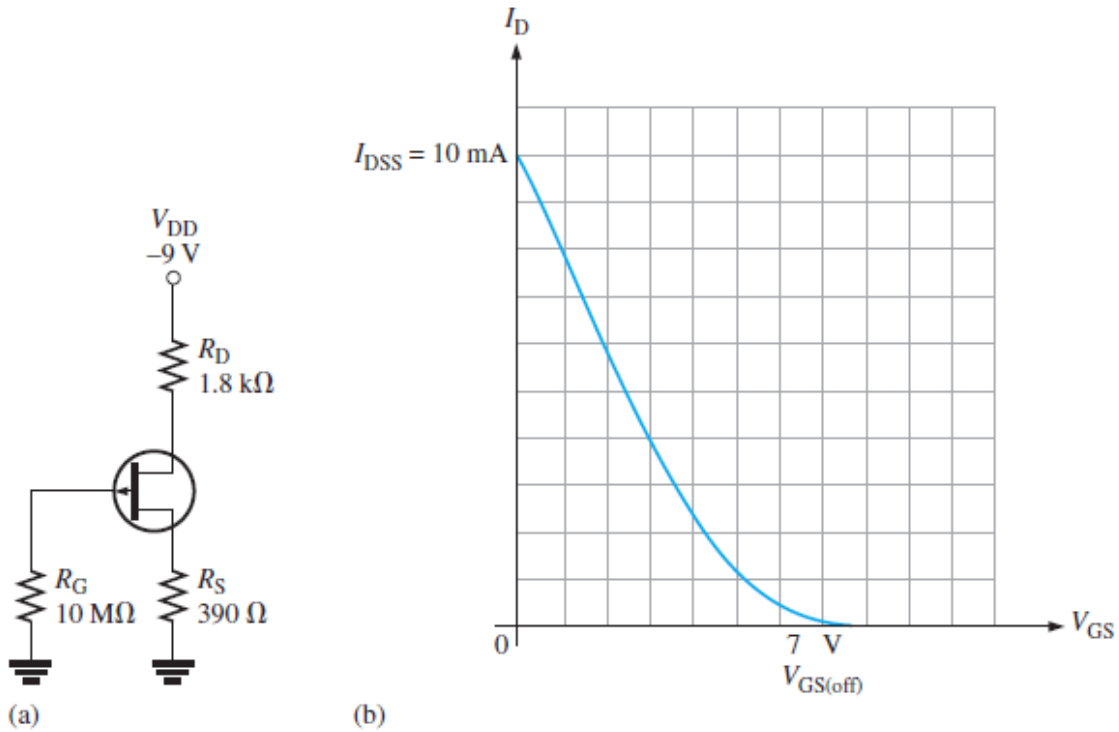
جامعة الأهرام الكندية
AHRAM CANADIAN UNIVERSITY

A large rectangular area with a vertical margin on the left and horizontal dotted lines for writing.



Q8

Find the Q-point for the *p*-channel JFET circuit in Figure



Sol
8

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....



كلية الهندسة

Faculty of Engineering

FACULTY OF ENGINEERING
AHRAM CANADIAN UNIVERSITY



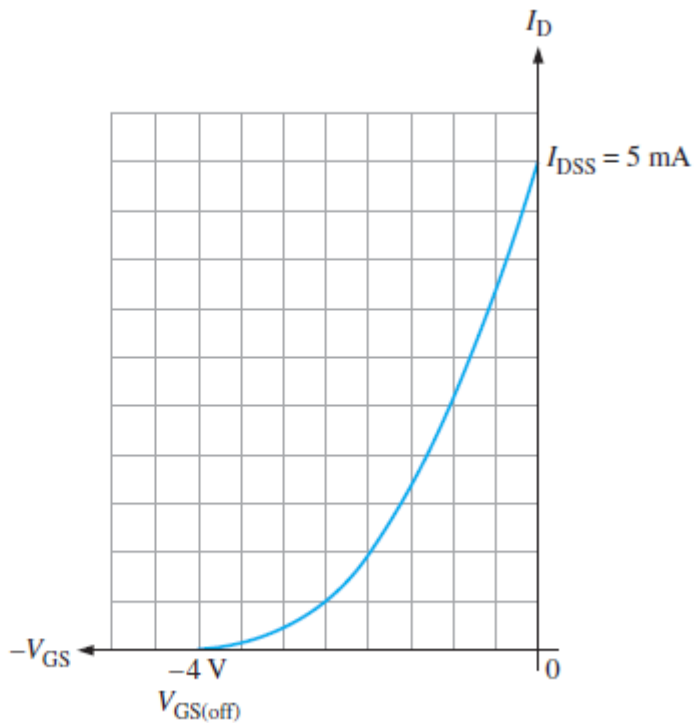
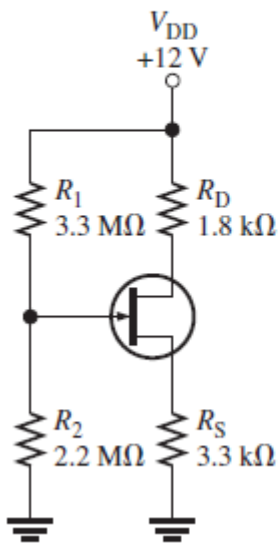
جامعة الأهرام الكندية
AHRAM CANADIAN UNIVERSITY

A large rectangular area with a vertical margin on the left and horizontal dotted lines for writing.



Q9

. Find the Q-point values for the JFET with voltage-divider bias in Figure



Sol
9

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....



كلية الهندسة

Faculty of Engineering

FACULTY OF ENGINEERING
AHRAM CANADIAN UNIVERSITY



جامعة الأهرام الكندية
AHRAM CANADIAN UNIVERSITY

A large rectangular area with a vertical margin on the left and horizontal dotted lines for writing.