El-Manzala Higher Institute for Engineering and Technology		وزارة التعليم العالي
First Semester :2023/2024	Code: : COM 121	
Course title: Electronic Engineering	Dr. Basma Yusef	HILE
	Eng. Madleen Mohamed	
Sheet (1)	Ling, Madicell Mondified	

Question (1):

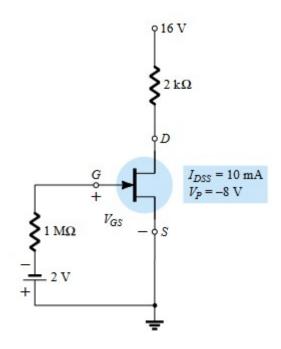
Using the data provided on the specification sheet of Fig. 5.39 and an average thresh-old voltage of VGS(Th) 3 V, determine:

- (a) The resulting value of k for the MOSFET.
- (b) The transfer characteristics.

Question (2):

Determine the following for the network of figure.

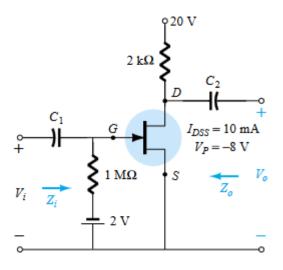
(a) VGS Q. (b) ID Q.(c) VDS. (d) VD. (e) VG.



Question (3):

The fixed-bias configuration of Example 6.1 had an operating point defined by $V_{GS_Q} = -2 \text{ V}$ and $I_{D_Q} = 5.625 \text{ mA}$, with $I_{DSS} = 10 \text{ mA}$ and $V_P = -8 \text{ V}$. The network is redrawn as Fig. 9.14 with an applied signal V_i . The value of y_{os} is provided as 40 μ S.

- (a) Determine g_m .
- (b) Find r_d .
- (c) Determine Z_i.
- (d) Calculate Z_o.
- (e) Determine the voltage gain A_v .
- (f) Determine A_v ignoring the effects of r_d .



Question (4):

The self-bias configuration of Example 6.2 has an operating point defined by $V_{GS_Q} = -2.6 \text{ V}$ and $I_{D_Q} = 2.6 \text{ mA}$, with $I_{DSS} = 8 \text{ mA}$ and $V_P = -6 \text{ V}$. The network is redrawn as Fig. 9.20 with an applied signal V_i . The value of y_{os} is given as 20 μ S.

- (a) Determine g_m.
- (b) Find r_d.
- (c) Find Z_i.
- (d) Calculate Z_o with and without the effects of r_d . Compare the results.
- (e) Calculate A_{ν} with and without the effects of r_{d} . Compare the results.

