Electronic Circuits
Final Exam Spring 2020

Q1. (Marks: 10)

For the network of Fig. 1, determine the following:

a) Voltage V_C across the capacitor
b) Draw the output waveform

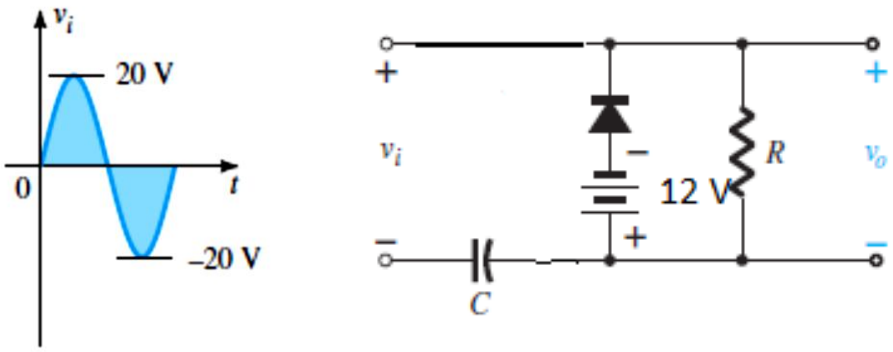

Figure 1

Q2. (Marks: 10)

For the network of Fig. 2, determine:
a. I_E.
b. V_C.
c. V_{CE}.

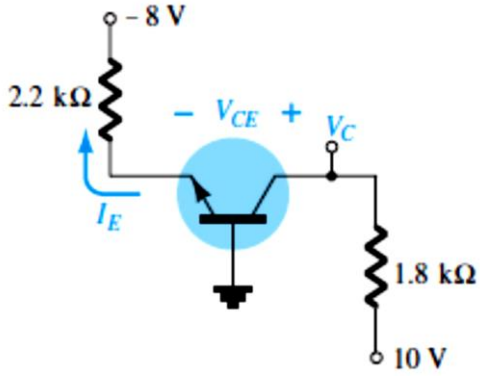

Figure 2

Q3. (Marks: 10)

For the common-base configuration of Fig. 3:
a. Determine r_e.
b. Find Z_i and Z_o.
c. Calculate A_v.

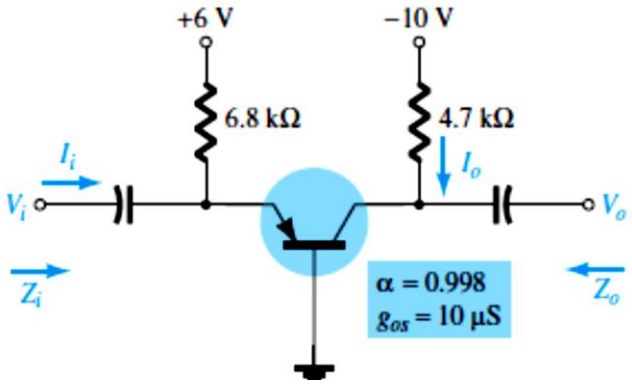

Figure 3

Q4. (Marks: 10)

a. Given I_{DSS} = 12 mA and V_P = -4 V, sketch the transfer characteristics for the JFET transistor using shorthand method.
b. Sketch the drain characteristics for the device of part (a).

Q5. (Marks: 10)

Sketch the schematic diagram of a CMOS inverter. If the supply voltage is 5V, and V_{in} =0 V, determine the exact value of output voltage for the following values of currents and voltages of MOSFET:
"ON" MOSFET: I_D= 4 mA, V_{DS} = 0.1 V.
"OFF" MOSFET: I_D = 0.5 μA.

Q6. (Marks: 10)

For the network of Fig. 4, determine:
a. V_G.
b. I_{DQ} and V_{GSQ}.
c. V_D and V_S.
d. V_{DSQ}.

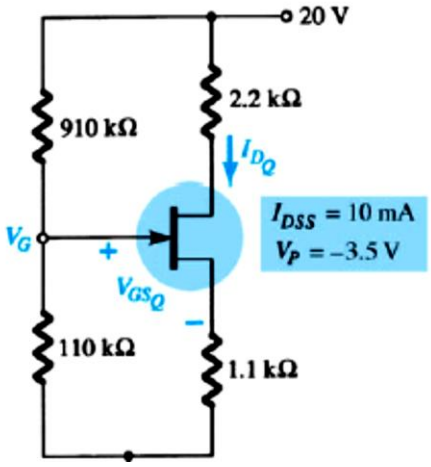

Figure 4

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