King Fahd University of Petroleum and Minerals
Electrical Engineering Department

EE203 Electronics I
Exam # II

Name:	I.D#	No.	Sec.#

Show all your work.

Question No.1 [6/15]

For the circuit in Figure 1, the transistor has $\beta=100$ and $R_C=4k\Omega$.

(i) Select R_E such that $I_C=1mA$.
(ii) Confirm that the transistor is working in active mode.
(iii) Find the small signal voltage gain $A_V=v_o/v_s$
(iv) Determine the input resistance seen by the signal source v_s.

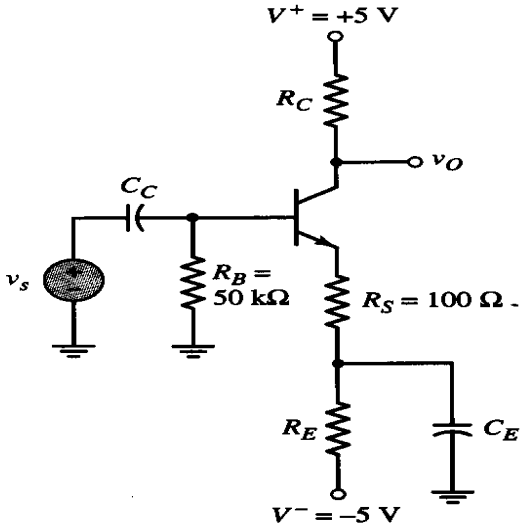

Figure 1

Question No. 2 [6/15]

Consider the MOSFET amplifier circuit shown, assume R_s=10kΩ, λ=0, V_t= 1V and $\mu C_{ox}W/L$=6mA/V^2.

i) Find I_D
ii) **Confirm** that the transistor working in pinch off.
iii) Calculate the voltage gain.
iv) Determine the input and output resistances.

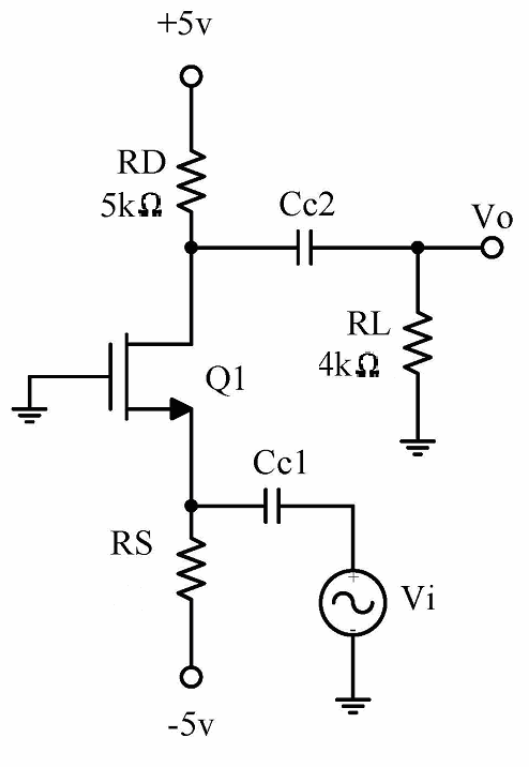

Figure 2

Question No. 3 [3/15]

Assume that B = 50 for the circuit in Fig. 3,

(a) Show that the BJT is **not** working in active region.

(b) Suggest how you can redesign the circuit to work in active region. Verify your answer.

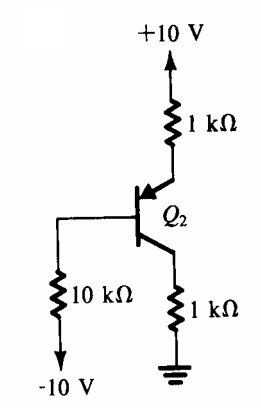

Fig.3