King Fahd University of Petroleum and Minerals
Electrical Engineering Department
EE-303 Electronics II
Exam I (042)

Name:	I.D#	No.	Sec.#

Q1) The amplifier in Fig. 1 is biased to operate at I_D=1mA and g_m=1mA/V. Neglecting r_o, Find the high frequency poles if C_{gs}=1pF and C_{gd}=0.2pF [40 Marks]

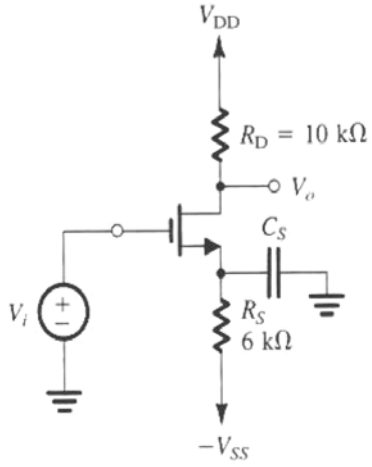

Fig. 1

Q2) For the common-emitter amplifier of Fig. 2, neglect r_x and r_o, and assume the current source ideal. Assume I=1mA, R_{sig}=R_C=R_L=10kΩ,

(a) Derive expressions for high frequency pole(s) due to the BJT internal capacitances

(b) Find the dominant high frequency pole value assuming f_T=600MHz, C_μ=2pF, and β_0=100.

(Hint: $f_T = \frac{g_m}{2\pi(C_\pi + C_\mu)}$)

(c) Select the values of C_E and C_C such that the dominant low frequency pole will be at 100Hz while minimizing the total capacitance. [50Marks]

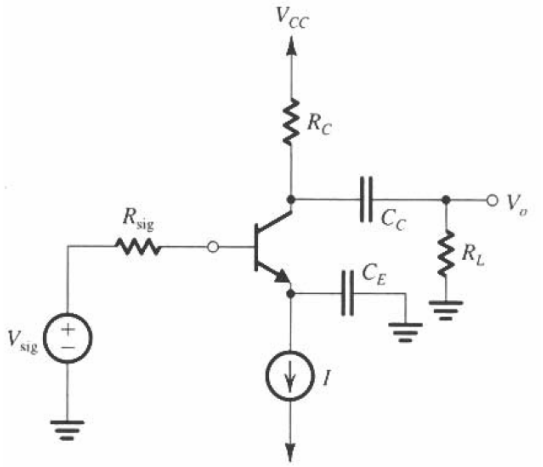

Fig. 2

Q3) (a) Investigate the effect of the biasing and offset currents of the op-amp on the performance of the inverting integrator.

(b) A non-inverting amplifier employs an op amp having a dc gain of 10^4 and unity-gain frequency of 10^6 Hz. What is the amplifier bandwidth if it is designed with a gain of 25V/V. [60Marks]