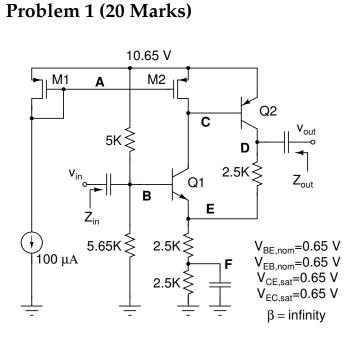
EC201 : ANALOG CIRCUITS QUIZ 2 — Maximum Marks 20 — TIME - 1 Hour Roll Number : Name :

Please explicitly state all assumptions you make. In your own interest, do not skip steps while working the problems. NO CREDIT WILL BE GIVEN FOR ANSWERS WITHOUT CLEAR EXPLANATIONS AS TO HOW YOU CAME TO THE SOLUTION. THE INSTRUCTORS JUDGMENT WILL BE FI-NAL IN THIS REGARD. WRITE THE FINAL ANSWERS IN THE COLUMNS 2 & 3 BELOW. DO NOT WRITE ANYTHING IN COLUMN 4

Problem 1



 $V_{TP} = 0.45 \text{ V}$ (1/2) $\mu C_{ox}(W/L) = 2.5 \text{ mA/V}^2$

Figure 1: Circuit diagram for Problem 1.

Consider the circuit shown in Figure 1. M1 and M2 are identical devices. All capacitors are infinite.

- a. Find the quiescent voltages at nodes A,B,C,D,E and F. (3 Marks)
- b. Find the quiescent currents through M1, M2, Q1 and Q2. (2 Marks)
- c. Determine the small signal gain v_{out}/v_{in} . (5 marks)
- d. Determine the input and output impedances Z_{in} and Z_{out} . (4 marks)
- d. Determine the amplitude of the largest input sinewave that will result in a distortion free output. **Do not skip steps.** (6 marks)

(a)	А	В	1
	С	D	1
	Е	F	1
(b)	M1	M2	1
	Q1	Q2	1
(c)	v_{out}/v_{in}		5
(d)	Z_{in}	Z_{out}	4
(e)	Max. amplitude		6