

Rubric Quiz-2

ECE515/315 QUIZ 2

Roll No.

Name

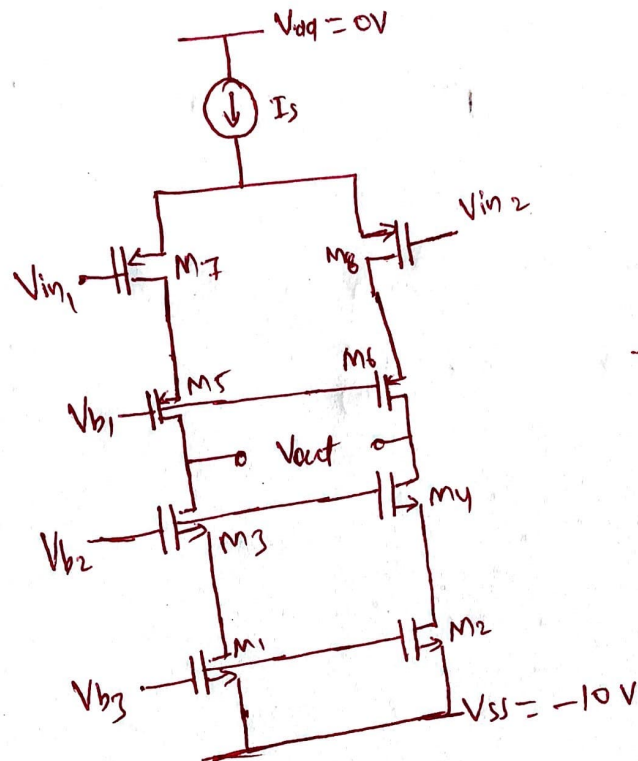
OPEN NOTES QUIZ. EXCHANGE OF NOTES NOT ALLOWED. ANSWER ALL QUESTIONS IN BRIEF. THERE ARE TWO QUESTIONS IN TWO PAGES.

Maximum Marks 20

7th Oct. 2025 12:05 PM - 12:20 PM

Q.1 Draw the topology of a MOS Telescopic Cascode differential amplifier with $V_{DD} = 0$, $V_{SS} = -10$ V. The differential input signals are applied to PMOS transistor pair. (10 Marks)

Answer



→ 10 Marks

Q.2 Compare the performance of following amplifiers with respect to typical values of different parameters:

Type of Amplifier	Gain	BW	UNITY GAIN BW	OUTPUT RESISTANCE	
Common source Input signal is applied between gate and source and output is taken between drain and source	$-g_m R_D \gg 1$ High	Low (due to miller effect on C_{gd})	Moderate ($UGBW = A_v \cdot BW = \text{High} \cdot \text{Low}$)	R_D (High)	→ 3 Marks (each carry 0.75 mark)
Common drain (or) Source follower Input signal is applied between gate and drain and output is taken between drain and source	$\frac{g_m R_S}{1 + g_m R_S} \approx 1$	High (no miller multiplication)	High	$R_{out} = 1/g_m$ (Low)	→ 4 marks (each carry 1 mark)
Common gate Input signal is applied between gate and source and output is taken between drain and gate	$g_m R_D$ High	Very high (miller effect negligible)	Very high	$R_{out} = R_D$ (High)	→ 3 marks (each carry 0.75 marks)

Tabulate your answers in above table.

(10 Marks)