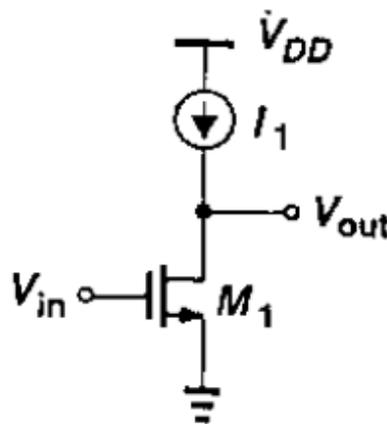


13. How the voltage gain of a common-source stage is maximized? [K₂]
14. Sketch the small signal differential gain of a differential pair as a function of the input CM level. [K₂]
15. List the statistical characteristics of noise. [K₁]
16. Define noise figure. [K₁]
17. List some applications of feedback. [K₁]
18. An amplifier with a forward gain of A_0 and two poles at 10MHz and 500MHz is placed in a unity gain feedback loop. Calculate A_0 for a phase margin of 60°. [K₂]
19. Write the $T(s)$ of a multipole system. [K₂]
20. Define Barkhausen criteria. [K₁]

PART C (6 x 5 = 30 Marks)

21. Explain constant G_m biasing. [K₂]
22. Calculate the small-signal voltage gain of the circuit shown, assuming M_1 is biased in saturation. [K₄]



23. Explain differential pair with MOS loads in detail. [K₂]
24. Draw and explain implementation of a two stage op-amp and write the expression of A_V . [K₂]
25. A differential amplifier has inputs $V_1=7mV$ and $V_2=9mV$. It has a differential mode gain of 80dB and a CMRR of 90dB. Determine the output voltage. [K₂]

26. Discuss about the need for compensation in op-amp. [K₂]

PART D (4 x 10 = 40 Marks)

27. Derive the voltage gain of CG with active load. Plot the output characteristics with respect to input differential voltage. Also derive the expression for driver current as a function of the differential voltage. [K₃]

28. Describe in detail the noise in single stage amplifiers. [K₂]

29. Analyse the operational amplifier circuit in terms of slew rate model and high frequency response. [K₄]

30. Explain compensation methods of two stage op-amps in detail. [K₂]
