(3 Hours) **Total Marks: 80**

N.B: (1) Question No.1 is compulsory and solves ant three questions from remaining questions.
(2) Assume suitable data if necessary.
(3) Draw neat and clean figures.

1.	Answer any four:	
	(a) Explain trade off in Analog design with the help of analog design octagon	5
	(b) For N channel MOSFET draw i) small signal model ii)small signal model with channel length modulation iii)small signal model with body effect	5
	(c) Explain importance of Miller theorem	5
	(d) Explain input output characteristic of Phase detector circuit	5
	(e) Compared performance of op-amp topologies	5
2.	(a) Derive voltage gain of diode connected load CS amplifier	10
	(b) Derive equation of differential gain, common mode gain, CMRR of differential amplifier	10
3.	(a) Explain in detail how to generate temperature independent reference	10
	(b) Explain concept of switched capacitor circuit and explain switched capacitor amplifier in detail.	10
4	(a) Design an amplifier that meet the following specification with a phase margin of 60.assume the channel length is to be 1µm Av>5000v/v ,Vdd=2.5 ,Vss= -2.5v ,GB=5MHz , CL=10pf , SR>10v/µsec, Vout range=+/- 2V, ICMR= -1 to 2V, Pdiss≤ 2mw.	20
5	(a) List down the performance parameter of VCO and explain trade off between them	10
	(b) Give comparison of full custom design and semi custom design	10
6	Write short notes(any three) (a) White and flicker noise in MOSFET (b) AMS design flow (c) Clock feed through in MOSFET (d) Band gap reference	20

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