

Total No. of Questions : 8]

SEAT No. :

P2049

[4460]-231

[Total No. of Pages : 2

M.E. (E & TC) (VLSI & Embedded Systems) (Semester - I)
ANALOG & DIGITAL CMOS IC DESIGN
(2008 Pattern)

Time : 3 Hours]

[Max. Marks : 100

Instructions to the candidates:

- 1) *Answer any three questions from each section.*
- 2) *Answers to the two sections should be written in separate books.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Use of electronic pocket calculator is allowed.*
- 5) *Assume suitable data, if necessary.*

SECTION - I

- Q1)** a) What is need of current mirror? Design current mirror for 100 μ A. [8]
b) Why are precision & accuracy in voltage reference needed? Draw block diagram & schematic for band gap reference. [8]
- Q2)** a) What are advance trends in ultra fast logic design? [8]
b) What is need of NORA logic? Explain with suitable example. [8]
- Q3)** a) Design 16:1 Mux using Transmission Gates. Compare with the conventional method. [8]
b) Design CMOS combinational logic for $X = ABCD + EFG$. Calculate area on chip. Compare with other methods. [8]
- Q4)** Write short notes on any three : [18]
a) Power Delay Product and its significance.
b) λ parameter & design rules.
c) Low voltage Opamp.
d) MOSFET as active resistor.

P.T.O.

SECTION - II

- Q5)** a) What are the types of hazard? What are the sources of it? With appropriate example, explain hazard with the solutions. [8]
b) Draw ac equivalent ckt for MOSFET. Explain paracitics in detail. [8]
- Q6)** a) Draw FSM diagram & write VHDL code for 11011 Moore sequence detector. [8]
b) What is metastability? What are sources of it? Explain solutions in detail.[8]
- Q7)** a) With suitable ckt diagram. carry out analysis of CMOS difference amplifier. Explain various performance parameters. [8]
b) Explore macro model of Opamp. [8]
- Q8)** Write short notes on any three : [18]
a) High gain amplifier.
b) Differential output Opamp.
c) Technology scaling.
d) Current sink & its performance parameters.

