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Seventh Semester B.E. Degree Examination, June/July 2013

VLSI Circuits and Design

Max. Marks: 100

Note: Answer FIVE full questions, selecting at least TWO questions from each part.

PART – A

1.
 - a. Compare speed/power performance of available technologies. (06 Marks)
 - b. With neat diagrams, explain enhancement mode transistor action. (08 Marks)
 - c. Compare CMOS and bipolar technologies. (06 Marks)
2.
 - a. Derive expression for I_{ds} in non saturated region of a MOS transistor. (06 Marks)
 - b. Show that an nMOS inverter driven directly from the output of another should have a $Z_{p,v}/Z_{p,d}$ ratio of 4/1. (06 Marks)
 - c. Draw circuit of CMOS inverter and explain various regions of operation. (06 Marks)
 - d. Draw nMOS transistor model diagram. (02 Marks)
3.
 - a. Write a note on MOS layers. (04 Marks)
 - b. Draw circuit symbols and stick diagram of 2 input i) nMOS; ii) CMOS inverter. (10 Marks)
 - c. Explain lambda based design rules. (06 Marks)
4.
 - a. Derive expression for sheet resistance. (06 Marks)
 - b. Draw rise time model diagram for CMOS inverter and derive expression for rise time. (08 Marks)
 - c. Write a note on wiring capacitances. (06 Marks)

PART – B

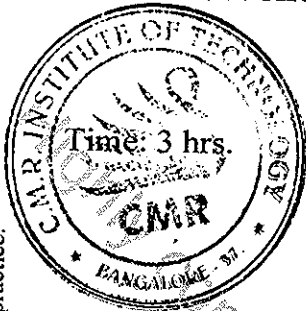
5.
 - a. What are the different scaling models and scaling factors? Draw scaled nMOS transistor diagram. (08 Marks)
 - b. Indicate scaling factors for i) Gate area; ii) Gate capacitance; iii) Gate delay; iv) Current density; v) Power speed product; vi) Channel resistance. (06 Marks)
 - c. Write a note on limitations of scaling. (06 Marks)
6.
 - a. Draw circuit symbol and stick diagram of 2 input i) nMOS; ii) CMOS NAND gate. (08 Marks)
 - b. Explain basic form of simple two phase clock generator circuit and its waveform. (08 Marks)
 - c. Write a note on clocked CMOS (C^2 MOS) logic. (04 Marks)
7.
 - a. Explain one bus, two bus and three bus architecture. (06 Marks)
 - b. Draw and explain: i) 4×4 cross bar switch; ii) 4×4 barrel shifter. (10 Marks)
 - c. Define regularity. Find regularity factor for 4×4 bit barrel shifter. (04 Marks)
8.
 - a. Explain the block diagram of 4 bit data path for processor. (05 Marks)
 - b. Explain implementing ALV functions with an adder. (15 Marks)

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Seventh Semester B.E. Degree Examination, June/July 2013

Wireless Communication



Max. Marks: 100

Note: Answer FIVE full questions, selecting at least TWO questions from each part.

PART - A

- 1 a. With a neat flow diagram, explain handoff operation in AMPS system. (10 Marks)
- b. Define intraoffice and interoffice call in a PSTN system. (04 Marks)
- c. Explain the purpose of the AMPS supervisory audio tones. (06 Marks)

- 2 a. Explain the following:
 - i) Base Station Controller (BSC)
 - ii) Inter Working Unit (IWU)
 - iii) Gateway Mobile Switching Centre (GMSC)
 - iv) International Mobile Equipment Identity Number (IMEI) (10 Marks)
- b. With a neat diagram, explain mobile originated call operation in cellular network system. (10 Marks)

- 3 a. Explain the process of power control in cellular system. (08 Marks)
- b. Explain the following capacity expansion techniques:
 - i) Cell sectoring
 - ii) Overlaid cells (10 Marks)
- c. For a mobile system cluster size of 7, determine the frequency reuse distance if the cell radius is five kilometers. Repeat the calculations for a cluster size of 4. (02 Marks)

- 4 a. With a neat block diagram, explain the speech processing in a GSM system. (10 Marks)
- b. Discuss the frame format of a GSM system and draw the different time slot bursts used in GSM. (10 Marks)

PART - B

- 5 a. List different call setup operations. With flow diagram, explain any two operations. (10 Marks)
- b. With a neat diagram explain GSM inter BSC handover operation. (10 Marks)

- 6 a. With a neat diagram explain cdma 2000 wireless system. (10 Marks)
- b. With a neat diagram, explain the generation of the CDMA synchronization and paging channel. (10 Marks)

- 7 a. Explain the following:
 - i) Block inter leaving
 - ii) Frequency hopping spread spectrum (10 Marks)
- b. With a neat diagram, explain QPSK modulation. (10 Marks)

- 8 a. Explain the details about IEEE 802.11 X standards. (10 Marks)
- b. Explain the details about IEEE 802.15 X standards. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.