PG Odd Semester (CBCS) Exam., December—2016

COMPUTER SCIENCE

(9th Semester/3rd Semester)

Course No. : MCS–904 (C)/MS–304 (C)

Full Marks : 75
Pass Marks : 30

Time : 3 hours

The figures in the margin indicate full marks for the questions

(New Course)

(VLSI DESIGN)

Answer **five** questions, selecting **one** from each Unit

UNIT—I

1. Explain basic CMOS technology. 15

2. Explain basic MOS transistor operation. 15

UNIT—II

3. Explain the CMOS inverter with DC characteristics. 15

4. Explain stick diagram and lambda ( ) based design rules. 15

UNIT—III

5. Design a CMOS complementary logic circuit for $F \quad A \quad BC$ and minimize the number of transistors used in the circuit. 15

6. *(a)* Explain pass-transistor/transmission-gate logic technology. 5

(b) Design a complementary logic circuit for a 2-to-1 multiplexer. 10

UNIT—IV

7. Build a Braun array multiplier to perform the multiplication of $A \quad a_3 a_2 a_1 a_0$ and $B \quad b_3\, b_2\, b_1\, b_0$. 15

8. Design a RAM using CMOS technology. 15

UNIT—V

9. Write a VHDL program for a full adder in structural, dataflow and behavioural modelling style. 15

10. Explain the need for CMOS testing. 15

(Old Course)

(ADVANCED COMPUTER ARCHITECTURE AND PARALLEL PROCESSING)

Answer **five** questions, selecting **one** from each Unit

UNIT—I

1. *(a)* Explain the following : 2×5=10

(i) Instruction cycle

(ii) Pipeline cycle

(iii) Scalar instructions

(iv) Vector instructions

(v) Interconnection networks

(b) With a proper diagram, explain the concept of pipeline computers. 5

2. *(a)* Explain the various types of interconnection n/w's with proper diagrams. 12

(b) Name the various architectural classification schemes. 3

UNIT—II

3. *(a)* With proper diagrams, explain the differences between alignment network and interconnection network. 8

(b) Explain the inter PE communications. 7

4. With proper diagrams and example of architectures, explain the concepts of LCS and TCS. 15

UNIT—III

5. *(a)* What is message passing libraries? Explain its concept. 5

(b) Explain the concepts of the following : 2×5=10

(i) CRCW

(ii) CREW

(iii) EREW

(iv) 'fork statement'

(v) 'join statement'

6. Draw the architectures of RAM and PRAM and explain its concepts. 15

UNIT—IV

7. *(a)* Explain the following : 2+2+2=6

(i) Bitonic sort

(ii) Bitonic sequence

(iii) Bitonic merging

(b) Write a sequential recursive algorithm for sorting a bitonic sequence

$s \quad a_0, a_1, \cdots, a_{n\ 1}$ 9

8. *(a)* Explain sorting in PRAM models. 7

(b) Explain the concepts of increasing and decreasing comparator with diagrams.

4+4=8

UNIT—V

9. Explain the following : 5+5+5=15

(a) Parallel depth-first search

(b) Parallel breadth-first search

(c) Parallel best first search

10. *(a)* List the advantages of dataflow computer architectures. 5

(b) Explain the importance and working of real time systems with proper example.

5+5=10

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