

Registration No. :

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Total number of printed pages – 2

MCA
MCC 202

Special Examination – 2012

COMPUTER ARCHITECTURE AND ORGANIZATION

Full Marks – 70

Time : 3 Hours

Answer Question No. 1 which is compulsory and any **five** from the rest.

The figures in the right-hand margin indicate marks.

1. Answer the following questions : 2×10
- State micro operations associated with different timing signals for fetch and decode phases of a basic computer.
 - Why signed complement system is preferred over signed magnitude system ? What are the difficulties imposed in 1's complement form ?
 - What do you mean by instruction pipeline ?
 - Draw the block diagram of Von Neumann stored-program computer architecture.
 - What are the advantages of assembly language ? How is it different from high-level language ?
 - Evaluate the arithmetic statement $X = (A+B)*(C+D)$ using a general register computer with three address Instruction format.
 - State and explain how many memory reference instructions are possible with direct mapping for 4096×16 basic computer.
 - What do you mean by universal logic gates and why ?
 - Explain through and write back operation in cache memory.
 - Explain with suitable example the register indirect addressing scheme.

P.T.O.

2. (a) Describe different types of computer instruction formats by considering 4096 × 16 basic computer. 5
- (b) Explain with diagram how memory reference and register reference instructions are distinguished. 5
3. (a) Add -70 with -80 by using 2's complement of binary system for 8 bit data register. Explain why the result appears incorrect for this operation. 5
- (b) How floating point numbers are represented. Represent $(+46.5)_{10}$ as a floating point binary number with mantissa 16 bits and exponent 8 bits. 5
4. (a) Explain booth algorithm for multiplication of binary integers in signed 2's complement form. Illustrate all the data flow statements taking 10111×10011 as an example. 5
- (b) Differentiate between hardwired control unit vs. micro programmed controlled unit. 5
5. (a) Write short notes on principles of locality of reference. 5
- (b) Explain virtual memory and its mapping scheme. 5
6. (a) What do you mean by direct mapping and what are the disadvantages associated with direct mapping and overcome by set associative mapping. 5
- (b) Why page table is required in a virtual memory system. Explain different ways of organizing a page table. 5
7. (a) How is an interrupt recognized ? Explain the interrupt cycle. 5
- (b) Compare memory mapped I/O vs. I/O mapped I/O instruction. 5
8. Discuss different addressing modes of an instruction. 10

