

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 110401

Roll No.

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B.Tech.

(SEM. IV) THEORY EXAMINATION 2013-14

COMPUTER ORGANIZATION

Time : 3 Hours

Total Marks : 100

Note :- Attempt all questions.

1. Attempt any two parts of the following : (10×2=20)
 - (a) (i) What is Full adder ? Draw the truth table for Full adder. Also realize the full adder using only NAND, NOR and NOT gates.
 - (ii) What is a multiplexer ? Give some applications of multiplexer. Design a two-input, 4-bit multiplexer.
 - (b) (i) Describe the basic format used to represent the floating-point numbers. Also define the concept of normalization and biasing with some example.
 - (ii) Describe carry-look ahead adder with block diagram.
 - (c) (i) Discuss the Booth's algorithm for twos-complement number. Also illustrate it with some example.
 - (ii) Give the structure of a basic sequential arithmetic and logic unit.



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2. Attempt any two parts of the following : (10×2=20)

- (a) (i) What is the difference between implied and immediate addressing modes ? Explain with an example.
- (ii) What are the requirements satisfied by an instruction set ? Also explain various types of instructions.
- (b) (i) Differentiate between complex instruction set computer and reduced instruction set computer.
- (ii) Describe auto increment and auto decrement addressing modes with proper example.
- (c) (i) Explain most common fields found in instruction formats. Also explain the three-address instruction and zero-address instruction formats with some example.
- (ii) Write short note on relative addressing mode and indirect addressing mode.

3. Attempt any two parts of the following : (10×2=20)

- (a) (i) Discuss the basic structure of micro program control unit.
- (ii) Explain an accumulator based central processing unit organization with block diagram.
- (b) What do you understand by hardwired control ? Give various methods to design hardwired control unit. Describe any one method used for designing of hardwired control unit.



(c) Write short notes on the following :

- (i) Parallelism in microinstructions
- (ii) Various pipeline performance measures.

4. Attempt any two parts of the following : (10×2=20)

- (a) (i) Discuss the conceptual organization of a multilevel memory system used in computers.
- (ii) Give the main physical differences between the following memory technologies : SRAMs, flash memories and CD-ROM.
- (b) What do you mean by cache memory ? How does it affect the performance of the computer system ? An eight-way set-associative cache is used in a computer in which the real memory size is 2^{32} bytes. The line size is 16 bytes, and there are 2^{10} lines per set. Calculate the cache size and tag length.

(c) Write short notes on the following :

- (i) Block replacement policies
- (ii) Address translation scheme for main memory.

5. Attempt any two parts of the following : (10×2=20)

- (a) (i) Explain why the single shared bus is so widely used as an interconnection medium in both sequential and parallel computers. What are its main disadvantages ?

- (ii) List various bus-arbitration methods. Discuss any one bus-arbitration method.
- (b) (i) Discuss the programmed IO method for controlling input output operations.
 - (ii) What is direct memory access ? Explain. Give block diagram of circuitry required for direct memory access.
- (c) Write short notes on any two of the following :
 - (i) Concurrency Control
 - (ii) System Management
 - (iii) Interrupts.



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