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

PAPER ID : 110401 Roll No. | | | | | | | | | | |

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.

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 disavantages ?

(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.