Roll No. .....

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BCA 3rd Semester (Old) Examination–November, 2014

COMPUTER SYSTEM ARCHITECTURE

Paper : BCA-201

Time : 3 hours ***Max. Marks : 75***

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard will be entertained after the examination.

Note : Attempt any **five** questions. All questions carry equal marks.

1. (a) What is meant by Instruction Execution ? How does timing and control take place in control unit for instruction execution ? Illustrate through its block diagram.

(b) What are the principal differences between RISC and CISC designs ? Briefly discuss the main characteristics of RISC architecture.

2. (a) How are I/O Module, I/O Peripherals, I/O Channels and External Devices inter-

related to each other ? Discuss in detail the functions performed by I/O module along with its block diagram depicting its structure.

(b) What is a microprogramming ? How does it differ from programming ? Explain.

3. (a) What are addressing modes ? What are its various types ? Indicate the significance and suitability of each of these addressing modes along with example of each.

(b) What is a Control Unit ? What are the basic functions of Control Unit ? What is the general model of a Control Unit ? Illustrate a CPU indicating all its functional units and corresponding control signals.

4. (a) What is Vector Processing ? What is its significance ? How is it achieved ? Also enumerate certain applications which demand Vector Processing.

(b) What is an Interconnection ? How does Hypercube Interconnection differ from Crossbar Switch Interconnection ? Explain.

5. (a) What do you understand by Inter-processor Arbitration ? How does Parallel Arbitration technique differ from Serial Arbitration technique ? Illustrate.

(b) Is programmed I/O technique not suitable for voluminous data transfer ? If not, then illustrate the suitable technique for this purpose through its block diagram.

6. (a) What do you understand by Inter-process Communication (IPC) ? What is synchronisation ? When and why is it needed ? How the same is achieved ? Explain.

(b) What do you mean by Array Processors ? What are various types of array processors ? How do they principally differ from each other ?

7. (a) What is meant by a floating point number ? What maximum and minimum floating-point number can be represented in a 64-bit computer having a sign bit for mantissa, 15 exponent bits and 32 mantissa bits ? Also indicate the positive/negative overflow and underflow ranges of the number of the scale.

(b) Define Pipelining. When, where and why is it necessary ? How Instruction Pipelining and Arithmetic Pipelining are achieved ? Explain.

8. (a) What are micro-operations ? What are its various types ? Illustrate the implementation of each category of micro-operations through its block diagram(s).

(b) What is Cache Coherence ? Why does it occur ? Briefly discuss atleast two techniques to overcome Cache Coherence problem.
