

**B.Tech. - VIEP - COMPUTER SCIENCE AND
ENGINEERING (BTCSVI)**

00888 Term-End Examination

December, 2015

BICS-022 : COMPUTER ARCHITECTURE

Time : 3 hours

Maximum Marks : 70

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

1. A bus-organized CPU has 16 registers with 32 bits in each, an ALU, and a destination decoder.
- (a) How many multiplexers are there in a bus, and what is the size of each multiplexer ?
 - (b) How many selection inputs are needed for MUX A and MUX B ?
 - (c) How many inputs and outputs are there in the decoder ?
 - (d) How many inputs and outputs are there in the ALU for data, including input and output carries ?
 - (e) Formulate a control word for the system assuming that the ALU has 35 operations.

5×2=10

2. What has to be done with the bus system for being able to transfer information from any register to any other register ? Specifically, show the connections that must be included to provide a path from the outputs of register C to the input of register A. 10
3. Discuss the utility of RISC and CISC architecture by comparing their various features. 10
4. What is Virtual Memory ? Discuss the protection of a segmented virtual memory in Pentium. 10
5. Show with timing diagrams, the instances of synchronous bus output to a slave from a bus master. 10
6. (a) Draw a full adder and explain its logic circuit. 5
(b) What are the various phases of instruction cycle ? Give the micro-operation of the fetch and decode phases. How are the first two register transfer statements implemented ? 5
7. (a) Design a flow chart showing the instruction cycle and interrupt cycle for a basic computer operation. 5
(b) Tabulate various memory reference instructions. Also explain BUN and BSA in detail. 5

8. (a) What is mapping ? Name the various types of mapping. Discuss direct mapping in brief. 5
- (b) Write a short note on memory hierarchy. 5
9. (a) Explain the concept of virtual memory. What are the advantages of virtual memory ? 5
- (b) What is associative memory ? Explain its architecture. 5
10. Explain any *two* of the following : $2 \times 5 = 10$
- (a) Multithreading
- (b) Polish Notation
- (c) Multicore Architecture
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