

11-12-2019

Roll No. ....

Total Pages : 3

OMCA/D-19

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**COMPUTER ARCHITECTURE &  
PARALLEL PROCESSING**

Paper-MCA-503

Time Allowed : 3 Hours]

[Maximum Marks : 80

**Note :** Attempt five questions in all, selecting at least one question from each Unit. Question No. 1 is compulsory. All questions carry equal marks.

**Compulsory Question**

1. Answer the following questions in brief :  $4 \times 4 = 16$ 
  - (a) Explain Basic-block scheduling.
  - (b) What is Cache coherence problem ? Distinguish between write invalidate and write update policies.
  - (c) What is Branch penalty ? Discuss different schemes to reduce them in brief.
  - (d) Explain addition-subtraction algorithm for numbers represented in 2's complement.

**UNIT-I**

2. (a) Derive an algorithm in flowchart form for adding and subtracting numbers represented in sign-magnitude representation. Also show the hardware needed for its implementation. 8

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- (b) Devise Booth's multiplication algorithm in flowchart form and demonstrate its use with an example. 8
3. (a) What is Hardwired Control Unit ? Explain the working of any hardwired-based technique of control unit with suitable diagram. 8
- (b) Explain Microinstruction addressing scheme with suitable diagram. 8

### UNIT-II

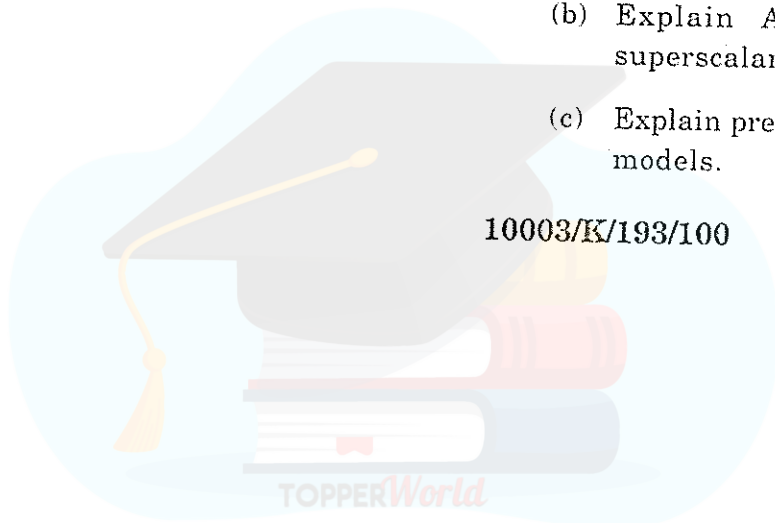
4. (a) What is Computer architecture ? Explain evolution of concept of Computer architecture. 8
- (b) Explain the pipelined processing of load and store instructions. 8
5. (a) What is VLIW architecture ? Explain it with the help of block diagram. 8
- (b) Explain data dependencies among instructions with suitable examples. 8

### UNIT-III

6. (a) What is Shelving ? Discuss layouts of Shelving buffers used in Superscalar processor. 5
- (b) Explain Aligned and unaligned issue in superscalar processor. 5
- (c) Explain precise and imprecise exception handling models. 6

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7. (a) What is delayed branch technique ? Explain its various extensions. 8
- (b) What is Branch penalty ? Explain different techniques to reduce them. 8

#### UNIT-IV

8. (a) What are Direct Interconnection Networks ? Explain 2D mesh, hypercube and fat tree networks. 8
- (b) What are Direct Interconnection Networks ? Explain construction and working of Butterfly Network. 8
9. (a) Explain Software based cache coherence protocol. 8
- (b) Explain the architecture of CC-NUMA Computer with suitable diagram. 8

