

Roll No.

Total Pages : 03

OMCA/D-18

10013

COMPUTER ARCHITECTURE AND
PARALLEL PROCESSING
MCA-503

Time : Three Hours]

[Maximum Marks : 80

Note : Attempt *Five* questions in all. Q. No. 1 is compulsory.
Attempt *four* more questions selecting *one* question
from each Unit.

1. Answer the following questions in brief :
- (a) Explain floating point representation of numbers.
 - (b) Explain different levels of parallelism.
 - (c) What are the functions of pre-decode unit in superscalar processor ?
 - (d) What are locked, pended and split transaction buses ?
- 4×4=16

Unit I

2. (a) Derive an algorithm in flowchart form for division when numbers are represented in sign-magnitude form. Also show that hardware needed for its implementation.
- 8

- (b) Derive an algorithm in flowchart form for adding and subtracting numbers represented in floating-point form. Also show that hardware needed for its implementation. 8
3. (a) What is hardwired control unit ? Explain the working of any hardwired-based technique of control unit with suitable diagram. 8
- (b) What is microprogrammed control ? Explain its working with the help of block diagram. 8

Unit II

4. (a) What is the concept of computational model ? Differentiate between von Neumann and applicative computational models. 8
- (b) Explain control dependency and resource dependencies among instructions with suitable examples. 8
5. (a) Differentiate between RISC and CISC FX pipelines with the help of suitable diagrams. 8
- (b) What is List Scheduler ? Explain its working with a suitable example. 8

Unit III

6. (a) Explain different instruction issue policies used in superscalar processor. 8
- (b) Explain different types of operand fetch policies used in superscalar processor. 8
7. Explain the following :
- (a) Early branch detection 5
- (b) Multiway branching. 5
- (c) Static branch prediction schemes. 6

Unit IV

8. Write short notes on the following :
- (a) Barrels shifter 8
- (b) Multicomputer architecture 8
9. (a) What are limitations of UMA Model ? How are these overcome by NUMA Model ? Explain. 8
- (b) Compare the memory requirements in different directory based schemes protocols of cache coherence. 8