

No. of Printed Pages : 3

**MCSE-011**

**MASTER OF COMPUTER  
APPLICATIONS (MCA) (REVISED)**

**Term-End Examination**

**June, 2022**

**MCSE-011 : PARALLEL COMPUTING**

*Time : 3 Hours*

*Maximum Marks : 100*

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**Note :** *Question No. 1 is compulsory. Attempt any  
three questions from the rest.*

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1. (a) Define Bernstein conditions for detection of parallelism. Discuss the role of Bernstein conditions in parallel computing.

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- (b) Differentiate between Linear pipelining and Non-linear pipelining.

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- (c) Discuss Flynn's classification of parallel computers.

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**P. T. O.**

- (d) Explain the problems with superscalar architecture. How are they addressed in VLIW architecture ? Describe the features of VLIW architecture. 10
2. (a) List the properties associated with Interconnection Networks. Also, discuss the issues, while designing an interconnection network. 10
- (b) Differentiate between perfect shuffle permutation and butterfly permutation. Also, discuss the role of permutation network in parallel computing. 10
3. (a) Differentiate between Scalar processing instruction and Vector processing instruction. List and explain the classification of vector processing instructions. 10
- (b) Differentiate between COMA, NUMA and UMA in detail. 10

[ 3 ]

4. (a) Explain the following terms : 10
- (i) Granularity
  - (ii) FAT tree
  - (iii) Bisection bandwidth
- (b) Write short notes on Grid computing and Hyperthreading. 10
5. Write short notes on the following :  $4 \times 5 = 20$
- (a) Amdahl's law
  - (b) Cluster computing
  - (c) Sorting using comparators
  - (d) PRAM model