

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

Term-End Examination

December, 2024

MCSE-011 : PARALLEL COMPUTING

Time : 3 Hours

Maximum Marks : 100

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

1. (a) Describe Bernstein condition in detail with
an example. 10
- (b) Explain the following levels of parallel
processing : 10
 - (i) Instruction level
 - (ii) Loop level
 - (iii) Procedure level
 - (iv) Program level

- (c) Differentiate between VLW and Vector procession. 10
- (d) Write and explain matrix multiplication and CREW algorithm using CRCW. 10
2. (a) Write the Bitonic sort algorithms. Apply the algorithm to sort the following list : 10
(10, 20, 13, 3, 15, 19, 22, 37, 30, 42, 36, 45, 49, 71, 82)
- (b) Compare cluster computing and grid computing. 10
3. (a) Differentiate between loosely coupled and tightly coupled systems. 10
- (b) Discuss the term speed up used for parallel algorithms. Also explain the Gustafson's law to measure speed up performance. 10
4. (a) Explain temporal parallelism and data parallelism with the help of an example for each. 10

- (b) Explain Benz network. Show the interconnections of Benz network for the following permutations : 10

$$P = \begin{pmatrix} 0 & 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ 2 & 6 & 0 & 4 & 7 & 3 & 5 & 1 \end{pmatrix}$$

5. Write short notes on the following : 4×5=20

- (a) Merge sort and its analysis
- (b) Hyperthreading—its features and functionality
- (c) Classification of parallel computers
- (d) Levels of parallel processing

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