

K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

April – May 2024

(B.Tech.) Program: **Information Technology Scheme: II**

Examination: **LY Semester: VIII**

Course Code: **ITDLC8024** and Course Name: **High Performance Computing**

Date of Exam: **16/05/2024**

Duration: **2.5 Hours**

Max. Marks: **60**

Instructions:

- (1) All questions are compulsory.
- (2) Draw neat diagrams wherever applicable.
- (3) Assume suitable data, if necessary.

		Max. Marks	CO	BT level
Q 1	Solve any six questions out of eight:	12		
i)	Explain the types of parallel computing?	2	CO1	Understand
ii)	Explain Classification of interconnection networks.	2	CO2	Understand
iii)	Explain task-dependency graph.	2	CO3	Understand
iv)	Explain Task Generation with types.	2	CO3	Understand
v)	Explain the performance measure speedup and cost.	2	CO4	Understand
vi)	Explain the effect of granularity on performance	2	CO4	Understand
vii)	Explain complete graph.	2	CO5	Understand
viii)	List out the CUDA applications.	2	CO6	Understand
Q.2	Solve any four questions out of six.	16		
i)	What do you mean by NUMA and UMA? Explain with Diagram.	4	CO1	Understand
ii)	Explain Multistage Omega Network Model.	4	CO2	Understand
iii)	Explain Recursive Decomposition with example.	4	CO3	Understand
iv)	Determine and Explain Amdahl's law.	4	CO4	Evaluate
v)	Explain Handshake for a blocking non-buffered send/receive operation.	4	CO5	Understand
vi)	Distinguish between OpenGL and OpenCL.	4	CO6	Analyze
Q.3	Solve any two questions out of three.	16		
i)	Explain parallel architecture with Diagram.	8	CO1	Understand
ii)	Illustrate task dependency graph for finding the minimum of given sequence {4, 9, 1, 7, 8, 11, 2, 12}.	8	CO3	Understand

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iii)	Construct Splitting a Cartesian topology of size $2 \times 4 \times 7$ into (a) four subgroups of size $2 \times 1 \times 7$, and (b) eight subgroups of size $1 \times 1 \times 7$.	8	CO5	Create
Q.4	Solve any two questions out of three.	16		
i)	Construct of 4D hypercubes from hypercubes of lower dimension.	8	CO2	Create
ii)	Determine and Explain Gustavson law.	8	CO4	Evaluate
iii)	Explain CUDA architecture with its advantages and disadvantages.	8	CO6	Understand