

B. E. (Comps) (Sem-VIII) (CBCGS)

43746

High Performance Computing (DLOC)

University of Mumbai

Examinations Summer 2022

Time: 2 hour 30 minutes

Max. Marks: 80

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Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	_____ classified the computers on the basis of organization of the constituent elements in the computer.
Option A:	Flynn
Option B:	Handler
Option C:	Shore
Option D:	Feng
2.	Two stage instruction pipeline has_____.
Option A:	fetch and Execute instruction
Option B:	Fetch and Write Instruction
Option C:	Fetch and Decode
Option D:	Fetch and Memory Excess

3.	Control hazards occurs due to_____
Option A:	ADD instruction
Option B:	MUL instruction
Option C:	DIV instruction
Option D:	Branch instruction
4.	We anticipate which pages we are going to browse ahead of time and issue requests for them in advance are known as _____.
Option A:	Prefetching
Option B:	Multithreading
Option C:	Multitasking
Option D:	Latency
5.	Messages in Cut through routing are divided into?

Option A:	Packets
Option B:	Segments
Option C:	Flits
Option D:	smaller units
6.	The number and size of tasks into which a problem is decomposed determines the_____ of the decomposition.
Option A:	Concurrency
Option B:	Task dependency
Option C:	Granularity
Option D:	Efficiency
7.	_____suited to problems that are solved using the divide-and-conquer strategy
Option A:	exploratory decomposition
Option B:	Recursive Decomposition

Option C:	speculative decomposition
Option D:	data decomposition
8.	Which speedup could be achieved according to Amdahl's law for infinite number of processors if 5% of a program is sequential and the remaining part is ideally parallel?
Option A:	Infinite speedup
Option B:	5
Option C:	20
Option D:	50
9.	Non-blocking Message Passing Operations are generally accompanied by a_____ operation.
Option A:	Send Buffer
Option B:	Buffer
Option C:	check-status
Option D:	Receive Buffer

10.	Which MPI function is used to determine the label of calling process?
Option A:	MPI_Init
Option B:	MPI_Comm_world
Option C:	MPI_Comm_size
Option D:	MPI_Comm_rank

Q2. (20 Marks Each)	Solve any Two Questions out of Three each	10 marks
A	Discuss the categories of computers based on Flynn's classification.	
B	Discuss in detail Pipeline hazards with its types.	
C	What are the limitations of Memory System Performance?	

Q3. (20 Marks Each)	Solve any Two Questions out of Three each	10 marks
A	Explain high performance computing platforms and their applications.	
B	Explain the different mapping techniques that are used for load balancing.	
C	Explain the Decomposition techniques in parallel computing.	

Q4. (20 Marks Each)	Solve any Two Questions out of Three each	10 marks
A	State and explain Amdahl's law. What is the relevance of Amdahl's law in HPC?	
B	Write a MPI program to find sum of N numbers.	
C	Explain blocking and non-blocking communication using MPI.	