

Masters

Parallel and Distributed Computing (CS621)

Question: 1 (Marks: 1)

Attempted Questions: 0 Total Questions: 50

In _____ control strategy, the control function is distributed among different components in the system.

Choices:

decentralized



distributed

centralized

supervised

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Question: **2** (Marks: 1)

Attempted Questions: **1** Total Questions: **50**

In _____ switching, a complete path has to be established prior to the start of communication between a source and a destination.

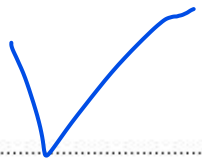
Choices:

packet

port

circuit

connect



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Question: 3 (Marks: 1)

Attempted Questions: 2 Total Questions: 50

Number of bits transmitted in a unit of time is known as _____.



Choices:

latency



diameter



bandwidth



bisection

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Question: 4 (Marks: 1)

Attempted Questions: 3 Total Questions: 50

A _____ topology is a network interconnection scheme in which each node is connected to every other node with a direct link.

Choices:

bus

star

mesh

switch



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Question: 5 (Marks: 1)

Attempted Questions: 4 Total Questions: 50

The possibility to use the same software in different environments is known as _____.

Choices:

reliability

portability

robustness

availability

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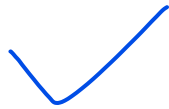
Question: **10** (Marks: 1)

Attempted Questions: **6** Total Questions: **50**

Decomposition of computation into a large number of tasks results in _____ decomposition.

Choices:

fine-grained



course-grained

medium-grained



best-grained

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Question: **11** (Marks: 1)

Attempted Questions: **7** Total Questions: **50**

Discrete optimization problems can be solved by using _____ decomposition technique.

Choices:

Recursive decomposition

Data decomposition

Exploratory decomposition

Speculative decomposition

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Question: **12** (Marks: 1)

Attempted Questions: **8** Total Questions: **50**

The problem of finding the minimum in a list is an example of decomposition of data based on

_____ 

Choices:

output data

input data

intermediate data

both input and output data

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Question: **13** (Marks: 1)

Attempted Questions: **9**

Total Questions: **50**

Which of the following decomposition techniques is/are more desirable for quicksort problem?

Choices:

Recursive decomposition



Data decomposition

Exploratory decomposition

Both data and recursive decomposition

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Question: **26** (Marks: 1)

Attempted Questions: **10** Total Questions: **50**

Sequential Consistency ensures that the result of any execution in a distributed system is equivalent to:

1/3

Choices:

Operations being executed in a random order

All processes executing concurrently without synchronization

Read and write operations being executed in a sequential order

Each process executing independently of others



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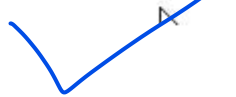
Question: **27** (Marks: 1)

Attempted Questions: **11** Total Questions: **50**

What does causal consistency guarantee regarding writes in a distributed system?

Choices:

All writes are seen by all processes in the same order.



Concurrent writes are seen in the same order on different machines.

All writes are executed concurrently to improve performance.

Writes that are causally related are seen in the same order by all processes.

GPUs have gained popularity due to their ability to:



Choices:

Run only real-world applications efficiently.

Execute single-threaded tasks faster than multi-core CPUs.

correct

Replace multi-core CPUs in all computing tasks.

Provide parallel processing capabilities for certain applications.

CUDA is designed for computation-intensive tasks to be executed on which hardware?



Choices:

CPU (Central Processing Unit)

GPU (Graphics Processing Unit)



RAM (Random Access Memory)

SSD (Solid State Drive)

GPUs accelerated libraries are commonly used in which type of applications?

Choices:

Text editors

Web browsers

Data science and machine learning

File compression utilities

In message passing, how do processors exchange data in a distributed memory system?



Choices:

They share a global memory space.

They use cache synchronization mechanisms.

They communicate through a communication network.



They directly access each other's local memory.

Question: **34** (Marks: 1)

Attempted Questions: **18** Total Questions: **50**

What is the size of the Basic MPI library in terms of the number of functions?

Choices:

Large (over 50 functions)

Medium (around 25 functions)

Small (around 10 functions)

Basic (6 functions)



In MPI, which function is commonly used to send a message from one process to another?

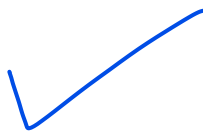


Choices:

MPI_Broadcast

MPI_Reduce

MPI_Send



MPI_Receive

MapReduce is a software framework which supports _____ computing on large data sets.

Choices:

serial

parallel

distributed

both parallel and distributed



Which of the following is NOT true regarding Google File System (GFS)?

Choices:

High security



Limited security

Only viable in a specific environment

Custom designed

_____ of Hadoop Distributed File System (HDFS) focuses on the individual instances of application data or the data content.

Choices:

Structural metadata

Descriptive metadata

Contextual metadata

Contextual and structural metadata

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Question: 39 (Marks: 1)

Attempted Questions: 23 Total Questions: 50

What is the primary function of Hadoop's HDFS (Hadoop Distributed File System)?

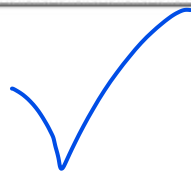
Choices:

Running complex machine learning algorithms.

Storing and distributing data across a cluster of machines.

Managing user access control.

Creating graphical visualizations



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Question: 40 (Marks: 1)

Attempted Questions: 24 Total Questions: 50

Which component of Hadoop is responsible for storing and managing data across a cluster?



Choices:

Hadoop Mapper



Hadoop Reducer



Hadoop NameNode



Hadoop TaskTracker

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Question: **41** (Marks: 3)

Attempted Questions: **25** Total Questions: **50**

Define the degree of the switch in interconnection networks.

the total number of ports in a switch is called the degree of switch.

Answer:



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Question: **42** (Marks: 3)

Attempted Questions: **26** Total Questions: **50**

Bill Dally, a prominent computer scientist has highlighted power efficiency and massive parallelism as major advantages of GPUs by considering two aspects. You are required to mention these aspects.

- 1- data access rate capability
- 2- data processing capability

Answer:



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Question: **43** (Marks: 3)

Attempted Questions: **28** Total Questions: **30**

Write down the names of the data-centric consistency models.

- 1- 1- Continuous Consistency
- 2- Consistent Ordering of Operations
- 3- Causal Consistency
- 4- Grouping Operations

Answer:



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Question: **44** (Marks: 3)

Attempted Questions: **28** Total Questions: **50**

What will happen when multiple threads attempt to manipulate the same data item, if proper care is not taken to synchronize?

 can results incoherent

Answer:



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Question: **45** (Marks: 3)

Attempted Questions: **29** Total Questions: **50**

The I/O tools are the collections of system software and libraries have grown up to address I/O issues. You are required to list three I/O tools.



Answer:



Here is the names of three I/O tools.

At Parallel file systems

- MPI-IO
- High level libraries
- Relationships between these are not always clear.

Do you think, a parallel runtime of a program can be evaluated asymptotically as a function of input size only? Justify your answer in either case.

sequential algorithm can be evaluated asymptotically as a same question aghy

Answer:



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Question: **47** (Marks: 5)

Attempted Questions: **31**

Write down any five interconnection network's properties in parallel and distributed computing.

Answer:



Following are five interconnection network's properties in parallel and distributed computing:

- 1- Bandwidth
- 2- Latency
- 3- bisection
- 4- diameter
- 5- degree of node

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Question: 49 (Marks: 5)

Attempted Questions: 34 Total Questions: 5

The process of dividing a computation into smaller parts, some or all of which may potentially be executed in parallel, is called decomposition. You are required to list 4 key decomposition techniques.

Answer:



Following are the 4 key decomposition techniques.

- 1- Recursive Decomposition
- 2- Data Decomposition
- 3- Exploratory Decomposition
- 4- Speculative Decomposition

Parallel and Distributed Computing (CS621)

Question: **50** (Marks: 5)

Attempted Questions: **34** Total Questions: **50**

Differentiate the following statement as Independent MPI IO and Collective MPI IO calls.

1. MPI_File_write()
2. MPI_File_write_all()
3. MPI_File_read()
4. MPI_File_read_all()

1ST AND 3RD independent MPI IO
2nd and 4th collective MPI IO

Answer:



Much of the effort associated with writing correct threaded programs is spent on _____ concurrent threads.

Choices:

scheduling

data accesses for

synchronizing

both scheduling and data access

Which of the following can be used to overcome the overhead of polling for availability of locks?



Choices:

Semaphores

Mutex-Locks

Condition variable

trylock () function



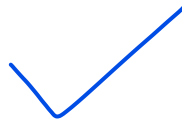
The length of the _____ in a task dependency graph is called the critical path length.



Choices:

shortest path

longest path



average of longest and shortest path

intersection of longest and shortest path

Which of the following decomposition techniques is/are more desirable for quicksort problem?

Choices:

Recursive decomposition



Data decomposition



Exploratory decomposition



Both data and recursive decomposition

Keep in view of Lustre file system, Identify, which of the following provides file service, and network request handling for one or more local OSTs?

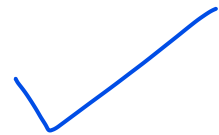
Choices:

Matadata Server (MDS)

Matadata Target (MDT)

Object Storage Server (OSS)

Object Storage Target (OST)



Keep in view of Lustre file system, Identify, which of the following stores file data (chunks of files)?



Choices:

Matadata Server (MDS)

Matadata Target (MDT)

Object Storage Server (OSS)

Object Storage Target (OST)



Which of the following is not true regarding POSIX I/O interface?



Choices:

Standard I/O interface across many platforms



open, read/write, close functions in C/C++/Fortran



Mechanism almost all serial applications use to perform I/O



Many ways for describing collective access



Parallel and Distributed Computing (CS621)

Question: **17** (Marks: 1)

Which of the following is not true regarding MPI-IO?



Choices:

Provides a high-level interface



Has a large number of routines



Facilitate Collective I/O



Facilitate Atomicity rules

Aggregates smaller read/write operations into larger operations is an example of _____.

Choices:

POSIX IO

MPI IO

Buffered IO



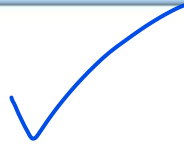
Non-Buffered IO

The time elapsed between the beginning and the end of its execution on a sequential computer is known as _____



Choices:

serial runtime



parallel runtime

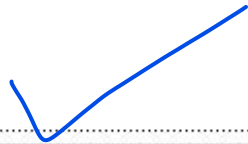
distributed runtime

both sequential and parallel runtime

Speedup S is computed by _____.

Choices:

$S = \Theta(n / \log n)$



$S = \Theta(n \log n)$

$S = \Theta(\log n)$

$S = \Theta(\log n)^n$

The phenomenon when the speedup become greater than p (number of processing elements) is known as _____ speedup.

Choices:

linear

superlinear

non-linear

supernon-linear

_____ is the product of parallel runtime and the number of processing elements used ($p \times T_P$).

Choices:

Cost

Overhead

Speedup

Efficiency

Using fewer than the maximum possible number of processing elements to execute a parallel algorithm is called _____.

Choices:

scaling up

scaling down

scaling out

scaling in

Question: 24 (Marks: 1)

Attempted Questions: 48 Total Questions: 50

_____ is a special class of distributed data-store which is characterized by the lack of simultaneous updates. Here, the emphasis is more on maintaining a consistent view of things for the individual client process that is currently operating on the data-store.

Choices:

Sequential model

Client centric consistency model

Data consistency model

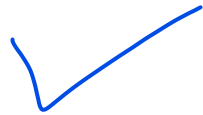
Incremental model

_____ the data and moving it closer to where it is needed helps to solve the scalability problem.



Choices:

Replicating



Aborting

Terminating

Paradigm