

Seat No -

Total number of questions : 60

## 11342\_High Performance Computing

Time : 1hr

Max Marks : 50

N.B

- 1) All questions are Multiple Choice Questions having single correct option.
  - 2) Attempt any 50 questions out of 60.
  - 3) Use of calculator is allowed.
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  - 5) Specially abled students are allowed 20 minutes extra for examination.
  - 6) Do not use pencils to darken answer.
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- 

### **Q.no 1. MIPS stands for?**

A : Mandatory Instructions/sec

**B : Millions of Instructions/sec**

C : Most of Instructions/sec

D : Many Instructions / sec

### **Q.no 2. Depth First Search is equivalent to which of the traversal in the Binary Trees?**

**A : Pre-order Traversal**

B : Post-order Traversal

C : Level-order Traversal

D : In-order Traversal

**Q.no 3. Regarding implementation of Breadth First Search using queues, what is the maximum distance between two nodes present in the queue? (considering each edge length 1)**

A : Can be anything

B : 0

C : At most 1

D : Insufficient Information

**Q.no 4. Calling a kernel is typically referred to as \_\_\_\_\_.**

A : kernel thread

B : kernel initialization

C : kernel termination

D : kernel invocation

**Q.no 5. The decomposition technique in which the function is used several number of times is called as\_\_\_\_\_**

A : Data Decomposition

B : Recursive Decomposition

C : Speculative Decomposition

D : Exploratory Decomposition

**Q.no 6. The decomposition technique in which the input is divided is called as\_\_\_\_\_**

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**Q.no 7. Several instructions execution simultaneously in \_\_\_\_\_**

A : processing

B : parallel processing

C : serial processing

D : multitasking

**Q.no 8. Following is not decomposition technique**

A : Data Decomposition

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**C : Serial Decomposition**

D : Exploratory Decomposition

**Q.no 9. How many Attributes required to characterize message passing paradigm**

**A : 2**

B : 4

C : 6

D : 8

**Q.no 10. Which of the following is not an in-place sorting algorithm?**

A : Selection sort

B : Heap sort

C : Quick Sort

**D : Merge sort**

**Q.no 11. The time complexity of heap sort in worst case is**

A :  $O(\log n)$

B :  $O(n)$

**C :  $O(n \log n)$**

D :  $O(n^2)$

**Q.no 12. Most message-passing programs are written using**

A : the single program multiple data (SPMD) model.

B : the multiple program and single data(MPSD) model

C : the single program single data (SPSD) model

D : the Multiple program multiple data (SPMD) model

**Q.no 13. Decomposition stands for**

A : Dividing Problem statement

B : Dividing no of processors

C : Dividing number of tasks

D : Dividing number of operation

**Q.no 14. Message-passing programs are often written using**

A : symmetric Paradigm

B : asymmetric Paradigm

C : asynchronous paradigm

D : synchronous paradigm

**Q.no 15. Following is not mapping technique**

A : Static Mapping

B : Dynamic Mapping

C : Hybrid Mapping

D : All of Above

**Q.no 16. Which of the following is not a stable sorting algorithm?**

A : Insertion sort

B : Selection sort

C : Bubble sort

D : Merge sort

**Q.no 17. Type of HPC applications of**

A : Management

B : Media mass

C : Business

D : Science

**Q.no 18. The kernel code is identified by the \_\_\_\_\_ qualifier with void return type**

A : \_host\_

B : \_\_global\_\_

C : \_device\_

D : void

**Q.no 19. The time complexity of a quick sort algorithm which makes use of median, found by an O(n) algorithm, as pivot element is**

A :  $O(n^2)$

B :  $O(n\log n)$

C :  $O(n\log(\log n))$

D :  $O(n)$

**Q.no 20. When the Breadth First Search of a graph is unique?**

A : When the graph is a Binary Tree

B : When the graph is a Linked List

C : When the graph is a n-ary Tree

D : When the graph is a Ternary Tree

**Q.no 21. Which of the following is not an application of Depth First Search?**

A : For generating topological sort of a graph

B : For generating Strongly Connected Components of a directed graph

C : Detecting cycles in the graph

D : Peer to Peer Networks

**Q.no 22. The logical view of a machine supporting the message-passing paradigm consists of p processes, each with its own \_\_\_\_\_**

A : Partitioned Address space

B : Exclusive address space

C : Logical Address Space

D : Non shared Address Space

**Q.no 23. Which one of the following is not shared by threads?**

A : program counter

B : stack

C : both program counter and stack

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**Q.no 24. Which of the following is a stable sorting algorithm?**

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**Q.no 25. In ..... only one process at a time is allowed into its critical section, among all processes that have critical sections for the same resource.**

A : Mutual Exclusion

B : Synchronization

C : Deadlock

D : Starvation

**Q.no 26. We have an internet cloud of resources In cloud computing to form**

A : Centralized computing

B : Decentralized computing

C : Parallel computing

D : All of Above

**Q.no 27. Broader concept offers Cloud computing .to select which of the following.**

A : Parallel computing

B : Centralized computing

C : Utility computing

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**Q.no 28. Writing parallel programs is referred to as**

A : Parallel computation

B : Parallel processes

C : Parallel development

D : Parallel programming

**Q.no 29. Network interfaces allow the transfer of messages from buffer memory to desired location without \_\_\_ intervention**

A : DMA

B : CPU

C : I/O

D : Memory

**Q.no 30. Consider the situation in which assignment operation is very costly. Which of the following sorting algorithm should be performed so that the number of assignment operations is minimized in general?**

A : Insertion sort

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C : Bubble sort

D : Merge sort

**Q.no 31. A process can be \_\_\_\_\_**

A : single threaded

B : multithreaded

C : both single threaded and multithreaded

D : none of the mentioned

**Q.no 32. High performance computing of the computer system tasks are done by**

A : node clusters

B : network clusters

C : both a and b

D : Beowulf clusters

**Q.no 33. Interprocessor communication that takes place**

A : Centralized memory

B : Shared memory

C : Message passing

D : Both A and B

**Q.no 34. Which of the following is not a noncomparison sort?**

A : Counting sort

B : Bucket sort

C : Radix sort

D : Shell sort

**Q.no 35. Parallel computing uses \_\_\_\_ execution**

A : sequential

B : unique

C : simultaneous

D : none of the answers is correct

**Q.no 36. When the event for which a thread is blocked occurs?**

A : thread moves to the ready queue

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**Q.no 37. Which of the following is NOT a characteristic of parallel computing?**

A : Breaks a task into pieces

B : Uses a single processor or computer

C : Simultaneous execution

D : May use networking

**Q.no 38. \_\_\_\_\_ are major issues with non-buffered blocking sends**

A : concurrent and mutual exclusion

**B : Idling and deadlocks**

C : synchronization

D : scheduling

**Q.no 39. If the given input array is sorted or nearly sorted, which of the following algorithm gives the best performance?**

A : Insertion sort

**B : Selection sort**

C : Bubble sort

D : Merge sort

**Q.no 40. Message passing system allows processes to \_\_\_\_\_**

**A : communicate with one another without resorting to shared data**

B : communicate with one another by resorting to shared data

C : share data

D : name the recipient or sender of the message

**Q.no 41. \_\_\_\_\_ leads to concurrency.**

A : Serialization

**B : Parallelism**

C : Serial processing

D : Distribution

**Q.no 42. The time required to create a new thread in an existing process is**

---

A : greater than the time required to create a new process

**B : less than the time required to create a new process**

C : equal to the time required to create a new process

D : none of the mentioned

**Q.no 43. RMI stands for?**

A : Remote Mail InvocationRemote Message Invocation

B : Remaining Method Invention

C : Remaining Method Invocation

**D : Remote Method Invocation**

**Q.no 44. Dynamic networks of networks, is a dynamic connection that grows is called**

A : Multithreading

B : Cyber cycle

**C : Internet of things**

D : None of these

**Q.no 45. If one thread opens a file with read privileges then**

---

A : other threads in the another process can also read from that file

**B : other threads in the same process can also read from that file**

C : any other thread can not read from that file

D : all of the mentioned

**Q.no 46. the basic operations in the message-passing programming paradigm are**

---

A : initiate and listen

B : wait and acknowledg

C : request and reply

D : send and receive

**Q.no 47. What is Inter process communication?**

A : allows processes to communicate and synchronize their actions when using the same address space

B : allows processes to communicate and synchronize their actions without using the same address space

C : allows the processes to only synchronize their actions without communication

D : none of the mentioned

**Q.no 48. Which of the ceramic components are easier through nano structuring?**

A : Lubrication

B : Coating

C : Fabrication

D : Wear

**Q.no 49. Execution of several activities at the same time.**

A : multi processing

B : parallel processing

C : serial processing

D : multitasking

**Q.no 50. It is \_\_\_\_\_ speed and \_\_\_\_\_ latency.**

A : High, high

B : Low, low

C : High, low

D : Low, high

**Q.no 51. Process synchronization of programs is done by**

A : input

B : output

C : operating system

D : memory

**Q.no 52. The management of data flow between computers or devices or between nodes in a network is called**

A : Flow control

B : Data Control

C : Data Management

D : Flow Management

**Q.no 53. Which of the following are TRUE for direct communication?**

A : A communication link can be associated with N number of process(N = max. number of processes supported by system)

B : A communication link can be associated with exactly two processes

C : Exactly  $N/2$  links exist between each pair of processes(N = max. number of processes supported by system)

D : Exactly two link exists between each pair of processes

**Q.no 54. Thread synchronization is required because \_\_\_\_\_**

A : all threads of a process share the same address space

B : all threads of a process share the same global variables

C : all threads of a process can share the same files

D : all of the mentioned

**Q.no 55. Which of the following two operations are provided by the IPC facility?**

A : write & delete message

B : delete & receive message

C : send & delete message

D : receive & send message

**Q.no 56. Which of the following is not the possible ways of data exchange?**

A : Simplex

B : Multiplex

C : Half-duplex

D : Full-duplex

**Q.no 57. Which of the following algorithms has lowest worst case time complexity?**

A : Insertion sort

B : Selection sort

C : Quick Sort

**D : Heap sort**

**Q.no 58. A thread shares its resources(like data section, code section, open files, signals) with \_\_\_\_\_**

A : other process similar to the one that the thread belongs to

B : other threads that belong to similar processes

**C : other threads that belong to the same process**

D : all of the mentioned

**Q.no 59. The parallelism achieved on the basis of conditions is called as**

A : Instruction level

**B : Thread level**

C : Transaction level

D : None of Above

**Q.no 60. The register context and stacks of a thread are deallocated when the thread?**

**A : terminates**

B : blocks

C : unblocks

D : spawns

---

**Answer for Question No 1. is b**

---

**Answer for Question No 2. is a**

---

**Answer for Question No 3. is c**

---

**Answer for Question No 4. is d**

---

**Answer for Question No 5. is b**

---

**Answer for Question No 6. is a**

---

**Answer for Question No 7. is b**

---

**Answer for Question No 8. is c**

---

**Answer for Question No 9. is a**

---

**Answer for Question No 10. is d**

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**Answer for Question No 11. is c**

---

**Answer for Question No 12. is c**

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**Answer for Question No 13. is a**

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**Answer for Question No 14. is c**

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**Answer for Question No 15. is d**

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**Answer for Question No 16. is b**

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**Answer for Question No 17. is d**

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**Answer for Question No 18. is b**

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**Answer for Question No 19. is b**

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**Answer for Question No 20. is b**

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**Answer for Question No 21. is d**

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**Answer for Question No 22. is b**

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**Answer for Question No 23. is c**

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**Answer for Question No 24. is a**

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**Answer for Question No 25. is a**

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**Answer for Question No 26. is d**

---

**Answer for Question No 27. is c**

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**Answer for Question No 28. is d**

---

**Answer for Question No 29. is b**

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**Answer for Question No 30. is b**

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**Answer for Question No 31. is c**

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**Answer for Question No 32. is d**

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**Answer for Question No 33. is d**

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**Answer for Question No 34. is d**

---

**Answer for Question No 35. is c**

---

**Answer for Question No 36. is a**

---

**Answer for Question No 37. is a**

---

**Answer for Question No 38. is b**

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---

**Answer for Question No 40. is a**

---

**Answer for Question No 41. is b**

---

**Answer for Question No 42. is b**

---

**Answer for Question No 43. is d**

---

**Answer for Question No 44. is c**

---

**Answer for Question No 45. is b**

---

**Answer for Question No 46. is d**

---

**Answer for Question No 47. is b**

---

**Answer for Question No 48. is c**

---

**Answer for Question No 49. is b**

---

**Answer for Question No 50. is c**

---

**Answer for Question No 51. is c**

---

**Answer for Question No 52. is a**

---

**Answer for Question No 53. is b**

---

**Answer for Question No 54. is d**

---

**Answer for Question No 55. is d**

---

**Answer for Question No 56. is b**

---

**Answer for Question No 57. is d**

---

**Answer for Question No 58. is c**

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**Answer for Question No 60. is a**

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B : Finding bipartiteness of a graph

C : GPS navigation system

D : Path Finding

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A :  $\theta(n)$

B :  $\theta(n\log n)$

C :  $\theta(n^2)$

D :  $\theta(n(\log n)^2)$

**Q.no 27. A process can be \_\_\_\_\_**

A : single threaded

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B : Shared memory

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**Q.no 31. Nanoscience can be studied with the help of \_\_\_\_\_**

A : Quantum mechanics

B : Newtonian mechanics

C : Macro-dynamic

D : Geophysics

**Q.no 32. The network topology used for interconnection network.**

A : Bus based

B : Mesh

C : Linear Array

D : All of above

**Q.no 33. The time required to create a new thread in an existing process is**

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B : Parallelism

C : Serial processing

D : Distribution

**Q.no 36. Dynamic networks of networks, is a dynamic connection that grows is called**

A : Multithreading

B : Cyber cycle

C : Internet of things

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**Q.no 37. Running merge sort on an array of size n which is already sorted is**

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**Q.no 51. The link between two processes P and Q to send and receive messages is called \_\_\_\_\_**

A : communication link

B : message-passing link

C : synchronization link

D : all of the mentioned

**Q.no 52. Dynamic networks is a dynamic connection that grows is called**

A : Multithreading

B : Cyber cycle

C : Internet of things

D : Cyber-physical system

**Q.no 53. The amount of data that can be carried from one point to another in a given time period is called**

A : Scope

B : Capacity

C : Bandwidth

D : Limitation

**Q.no 54. Octa-core processor are the processors of the computer system that contains**

A : 2 processors

B : 4 processors

C : 6 processors

D : 8 processors

**Q.no 55. Given a number of elements in the range [0....n^3]. which of the following sorting algorithms can sort them in O(n) time?**

A : Counting sort

B : Bucket sort

C : Radix sort

D : Quick sort

**Q.no 56. Termination of the process terminates \_\_\_\_\_**

A : first thread of the process

B : first two threads of the process

C : all threads within the process

D : no thread within the process

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A : terminates

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**Answer for Question No 2. is c**

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**Answer for Question No 3. is b**

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**Answer for Question No 6. is c**

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**Answer for Question No 8. is a**

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**Answer for Question No 9. is b**

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**Answer for Question No 10. is d**

---

**Answer for Question No 11. is a**

---

**Answer for Question No 12. is a**

---

**Answer for Question No 13. is c**

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**Answer for Question No 14. is a**

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**Answer for Question No 15. is a**

---

**Answer for Question No 16. is c**

---

**Answer for Question No 17. is d**

---

**Answer for Question No 18. is a**

---

**Answer for Question No 19. is d**

---

**Answer for Question No 20. is b**

---

**Answer for Question No 21. is b**

---

**Answer for Question No 22. is d**

---

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---

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---

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---

**Answer for Question No 26. is a**

---

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---

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---

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---

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---

**Answer for Question No 31. is a**

---

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---

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---

**Answer for Question No 34. is a**

---

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---

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---

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**Answer for Question No 38. is c**

---

**Answer for Question No 39. is c**

---

**Answer for Question No 40. is b**

---

**Answer for Question No 41. is a**

---

**Answer for Question No 42. is b**

---

**Answer for Question No 43. is d**

---

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---

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---

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---

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---

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---

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---

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**Answer for Question No 56. is c**

---

**Answer for Question No 57. is a**

---

**Answer for Question No 58. is d**

---

**Answer for Question No 59. is b**

---

**Answer for Question No 60. is c**

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Seat No -

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## 11342\_High Performance Computing

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**Q.no 1. The time complexity of a quick sort algorithm which makes use of median, found by an  $O(n)$  algorithm, as pivot element is**

A :  $O(n^2)$

B :  $O(n\log n)$

C :  $O(n \log(\log n))$

D :  $O(n)$

**Q.no 2. Which of the following is not a stable sorting algorithm?**

A : Insertion sort

B : Selection sort

C : Bubble sort

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**Q.no 3. Which one of the following is not shared by threads?**

A : program counter

B : stack

C : both program counter and stack

D : none of the mentioned

**Q.no 4. Following is not mapping technique**

A : Static Mapping

B : Dynamic Mapping

C : Hybrid Mapping

D : All of Above

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A : Mandatory Instructions/sec

B : Millions of Instructions/sec

C : Most of Instructions/sec

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B : asymmetric Paradigm

C : asynchronous paradigm

D : synchronous paradigm

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D : kernel invocation

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A : For generating topological sort of a graph

B : For generating Strongly Connected Components of a directed graph

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B : Exclusive address space

C : Logical Address Space

D : Non shared Address Space

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B : 0

C : At most 1

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**Q.no 14. In ..... only one process at a time is allowed into its critical section, among all processes that have critical sections for the same resource.**

A : Mutual Exclusion

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**Q.no 15. Depth First Search is equivalent to which of the traversal in the Binary Trees?**

A : Pre-order Traversal

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C : Level-order Traversal

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A : the single program multiple data (SPMD) model.

B : the multiple program and single data(MPSD) model

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A : Dividing Problem statement

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**A : Merge sort**

B : Typical in-place quick sort

C : Heap sort

D : Selection sort

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A : \_host\_

**B : \_\_global\_\_**

C : \_device\_

D : void

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B : When the graph is a Linked List

C : When the graph is a n-ary Tree

D : When the graph is a Ternary Tree

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A : processing

B : parallel processing

C : serial processing

D : multitasking

**Q.no 25. How many Attributes required to characterize messsage passing paradigm**

A : 2

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A : Multithreading

B : Cyber cycle

C : Internet of things

D : None of these

**Q.no 27. Nanoscience can be studied with the help of \_\_\_\_\_**

A : Quantum mechanics

B : Newtonian mechanics

C : Macro-dynamic

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A : greater than the time required to create a new process

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**Q.no 30. \_\_\_\_\_ leads to concurrency.**

A : Serialization

B : Parallelism

C : Serial processing

D : Distribution

**Q.no 31. Interprocessor communication that takes place**

A : Centralized memory

B : Shared memory

C : Message passing

D : Both A and B

**Q.no 32. RMI stands for?**

A : Remote Mail Invocation

Remote Message Invocation

B : Remaining Method Invention

C : Remaining Method Invocation

D : Remote Method Invocation

**Q.no 33. Which of the following is not a noncomparison sort?**

A : Counting sort

B : Bucket sort

C : Radix sort

D : Shell sort

**Q.no 34. What is Inter process communication?**

A : allows processes to communicate and synchronize their actions when using the same address space

B : allows processes to communicate and synchronize their actions without using the same address space

C : allows the processes to only synchronize their actions without communication

D : none of the mentioned

**Q.no 35. \_\_\_\_ are major issues with non-buffered blocking sends**

A : concurrent and mutual exclusion

B : Idling and deadlocks

C : synchronization

D : scheduling

**Q.no 36. Which of the ceramic components are easier through nano structuring?**

A : Lubrication

B : Coating

C : Fabrication

D : Wear

**Q.no 37. Parallel computing uses \_\_\_\_ execution**

A : sequential

B : unique

C : simultaneous

D : none of the answers is correct

**Q.no 38. A process can be \_\_\_\_\_**

A : single threaded

B : multithreaded

C : both single threaded and multithreaded

D : none of the mentioned

**Q.no 39. Which of the following is NOT a characteristic of parallel computing?**

A : Breaks a task into pieces

B : Uses a single processor or computer

C : Simultaneous execution

D : May use networking

**Q.no 40. If the given input array is sorted or nearly sorted, which of the following algorithm gives the best performance?**

A : Insertion sort

B : Selection sort

C : Bubble sort

D : Merge sort

**Q.no 41. It is \_\_\_\_\_ speed and \_\_\_\_\_ latency.**

A : High, high

B : Low, low

C : High, low

D : Low, high

**Q.no 42. Consider the situation in which assignment operation is very costly. Which of the following sorting algorithm should be performed so that the number of assignment operations is minimized in general?**

A : Insertion sort

**B : Selection sort**

C : Bubble sort

D : Merge sort

**Q.no 43. Running merge sort on an array of size n which is already sorted is**

A :  $O(n)$

**B :  $O(n \log n)$**

C :  $O(n^2)$

D :  $O(\log n)$

**Q.no 44. Message passing system allows processes to \_\_\_\_\_**

**A : communicate with one another without resorting to shared data**

B : communicate with one another by resorting to shared data

C : share data

D : name the recipient or sender of the message

**Q.no 45. If one thread opens a file with read privileges then \_\_\_\_\_**

A : other threads in the another process can also read from that file

**B : other threads in the same process can also read from that file**

C : any other thread can not read from that file

D : all of the mentioned

**Q.no 46. High performance computing of the computer system tasks are done by**

A : node clusters

B : network clusters

C : both a and b

D : Beowulf clusters

**Q.no 47. the basic operations in the message-passing programming paradigm are**

A : initiate and listen

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**Q.no 48. We have an internet cloud of resources In cloud computing to form**

A : Centralized computing

B : Decentralized computing

C : Parallel computing

**D : All of Above**

**Q.no 49. Broader concept offers Cloud computing .to select which of the following.**

A : Parallel computing

B : Centralized computing

**C : Utility computing**

D : Decentralized computing

**Q.no 50. Writing parallel programs is referred to as**

A : Parallel computation

B : Parallel processes

C : Parallel development

**D : Parallel programming**

**Q.no 51. Which of the following is not the possible ways of data exchange?**

A : Simplex

**B : Multiplex**

C : Half-duplex

D : Full-duplex

**Q.no 52. A thread shares its resources(like data section, code section, open files, signals) with \_\_\_\_\_**

A : other process similar to the one that the thread belongs to

B : other threads that belong to similar processes

**C : other threads that belong to the same process**

D : all of the mentioned

**Q.no 53. Thread synchronization is required because \_\_\_\_\_**

A : all threads of a process share the same address space

B : all threads of a process share the same global variables

C : all threads of a process can share the same files

**D : all of the mentioned**

**Q.no 54. The parallelism achieved on the basis of operations is called as**

A : Instruction level

B : Thread level

**C : Transaction level**

D : None of Above

**Q.no 55. Which of the following algorithms has lowest worst case time complexity?**

A : Insertion sort

B : Selection sort

C : Quick Sort

**D : Heap sort**

**Q.no 56. Resources and clients transparency that allows movement within a system is called**

**A : Mobility transparency**

B : Concurrency transparency

C : Performance transparency

D : Replication transparency

**Q.no 57. Multi-processor systems of the computer system has advantage of**

A : cost

**B : reliability**

C : uncertainty

D : scalability

**Q.no 58. Process synchronization of programs is done by**

A : input

B : output

**C : operating system**

D : memory

**Q.no 59. The management of data flow between computers or devices or between nodes in a network is called**

**A : Flow control**

B : Data Control

C : Data Management

D : Flow Management

**Q.no 60. A thread is also called \_\_\_\_\_**

**A : Light Weight Process(LWP)**

B : Heavy Weight Process(HWP)

C : Process

D : None of the mentioned

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**Answer for Question No 1. is b**

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**Answer for Question No 2. is b**

---

**Answer for Question No 3. is c**

---

**Answer for Question No 4. is d**

---

**Answer for Question No 5. is b**

---

**Answer for Question No 6. is c**

---

**Answer for Question No 7. is c**

---

**Answer for Question No 8. is c**

---

**Answer for Question No 9. is d**

---

**Answer for Question No 10. is d**

---

**Answer for Question No 11. is d**

---

**Answer for Question No 12. is b**

---

**Answer for Question No 13. is c**

---

**Answer for Question No 14. is a**

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**Answer for Question No 15. is a**

---

**Answer for Question No 16. is c**

---

**Answer for Question No 17. is a**

---

**Answer for Question No 18. is b**

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**Answer for Question No 19. is a**

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---

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---

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---

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---

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---

**Answer for Question No 31. is d**

---

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---

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---

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---

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---

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---

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---

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---

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### 11342\_High Performance Computing

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A : symmetric Paradigm

B : asymmetric Paradigm

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B : Media mass

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B : Coating

C : Fabrication

D : Wear

**Q.no 27. Network interfaces allow the transfer of messages from buffer memory to desired location without \_\_\_\_ intervention**

A : DMA

B : CPU

C : I/O

D : Memory

**Q.no 28. The network topology used for interconnection network.**

A : Bus based

B : Mesh

C : Linear Array

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B : Uses a single processor or computer

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D : May use networking

**Q.no 37. When the event for which a thread is blocked occurs?**

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B : thread remains blocked

C : thread completes

D : a new thread is provided

**Q.no 38. Interprocessor communication that takes place**

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B : Capacity

C : Bandwidth

D : Limitation

**Q.no 52. Thread synchronization is required because \_\_\_\_\_**

A : all threads of a process share the same address space

B : all threads of a process share the same global variables

C : all threads of a process can share the same files

D : all of the mentioned

**Q.no 53. Multi-processor systems of the computer system has advantage of**

A : cost

B : reliability

C : uncertainty

D : scalability

**Q.no 54. A thread is also called \_\_\_\_\_**

A : Light Weight Process(LWP)

B : Heavy Weight Process(HWP)

C : Process

D : None of the mentioned

**Q.no 55. The parallelism achieved on the basis of conditions is called as**

A : Instruction level

B : Thread level

C : Transaction level

D : None of Above

**Q.no 56. NVIDIA thought that 'unifying theme' of every forms of parallelism is the**

A : CDA thread

B : PTA thread

C : CUDA thread

D : CUD thread

**Q.no 57. Resources and clients transparency that allows movement within a system is called**

A : Mobility transparency

B : Concurrency transparency

C : Performance transparency

D : Replication transparency

**Q.no 58. One that is not a type of multiprocessor of the computer system is**

A : dual core

B : blade server

C : clustered system

D : single core

**Q.no 59. Which of the following are TRUE for direct communication?**

A : A communication link can be associated with N number of process(N = max. number of processes supported by system)

B : A communication link can be associated with exactly two processes

C : Exactly  $N/2$  links exist between each pair of processes(N = max. number of processes supported by system)

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**Q.no 60. In indirect communication between processes P and Q \_\_\_\_\_**

A : a) there is another process R to handle and pass on the messages between P and Q

B : there is another machine between the two processes to help communication

C : there is a mailbox to help communication between P and Q

D : none of the mentioned

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**Answer for Question No 1. is d**

---

**Answer for Question No 2. is c**

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**Answer for Question No 3. is c**

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**Answer for Question No 4. is c**

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**Answer for Question No 6. is b**

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**Answer for Question No 17. is a**

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**Answer for Question No 27. is b**

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**Answer for Question No 31. is d**

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---

**Answer for Question No 48. is c**

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**Answer for Question No 49. is c**

---

**Answer for Question No 50. is b**

---

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---

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---

**Answer for Question No 57. is a**

---

**Answer for Question No 58. is d**

---

**Answer for Question No 59. is b**

---

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---

Seat No -

Total number of questions : 60

## 11342\_High Performance Computing

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Max Marks : 50

N.B

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### **Q.no 1. How many Attributes required to characterize messsage passing paragdigm**

A : 2

B : 4

C : 6

D : 8

### **Q.no 2. Which of the following is not an application of Breadth First Search?**

A : Finding shortest path between two nodes

B : Finding bipartiteness of a graph

C : GPS navigation system

**D : Path Finding**

**Q.no 3. The time complexity of a quick sort algorithm which makes use of median, found by an O(n) algorithm, as pivot element is**

A :  $O(n^2)$

B :  $O(n\log n)$

C :  $O(n \log(\log(n)))$

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**Q.no 4. Several instructions execution simultaneously in \_\_\_\_\_**

A : processing

B : parallel processing

C : serial processing

D : multitasking

**Q.no 5. Type of HPC applications of**

A : Management

B : Media mass

C : Business

D : Science

**Q.no 6. In ..... only one process at a time is allowed into its critical section, among all processes that have critical sections for the same resource.**

A : Mutual Exclusion

B : Synchronization

C : Deadlock

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**Q.no 7. Depth First Search is equivalent to which of the traversals in the Binary Trees?**

A : Pre-order Traversal

B : Post-order Traversal

C : Level-order Traversal

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**Q.no 8. Which one of the following is not shared by threads?**

A : program counter

B : stack

C : both program counter and stack

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A : Partitioned Address space

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**Q.no 11. Which of the following is not an in-place sorting algorithm?**

A : Selection sort

B : Heap sort

C : Quick Sort

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**Q.no 12. Following is not decomposition technique**

A : Data Decomposition

B : Recursive Decomposition

C : Serial Decomposition

D : Exploratory Decomposition

**Q.no 13. Regarding implementation of Breadth First Search using queues, what is the maximum distance between two nodes present in the queue? (considering each edge length 1)**

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C : At most 1

D : Insufficient Information

**Q.no 14. Calling a kernel is typically referred to as \_\_\_\_\_.**

A : kernel thread

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C : kernel termination

D : kernel invocation

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C : Detecting cycles in the graph

**D : Peer to Peer Networks**

**Q.no 24. Following is not mapping technique**

A : Static Mapping

B : Dynamic Mapping

C : Hybrid Mapping

**D : All of Above**

**Q.no 25. The kernel code is identified by the \_\_\_\_\_ qualifier with void return type**

A : \_host\_

**B : \_\_global\_\_**

C : \_device\_

D : void

**Q.no 26. Broader concept offers Cloud computing .to select which of the following.**

A : Parallel computing

B : Centralized computing

**C : Utility computing**

D : Decentralized computing

**Q.no 27. High performance computing of the computer system tasks are done by**

A : node clusters

B : network clusters

C : both a and b

D : Beowulf clusters

**Q.no 28. Execution of several activities at the same time.**

A : multi processing

B : parallel processing

C : serial processing

D : multitasking

**Q.no 29. the basic operations in the message-passing programming paradigm are**

A : initiate and listen

B : wait and acknowledg

C : request and reply

D : send and receive

**Q.no 30. Nanoscience can be studied with the help of \_\_\_\_\_**

A : Quantum mechanics

B : Newtonian mechanics

C : Macro-dynamic

D : Geophysics

**Q.no 31. Interprocessor communication that takes place**

A : Centralized memory

B : Shared memory

C : Message passing

D : Both A and B

**Q.no 32. \_\_\_\_\_ leads to concurrency.**

A : Serialization

B : Parallelism

C : Serial processing

D : Distribution

**Q.no 33. If the given input array is sorted or nearly sorted, which of the following algorithm gives the best performance?**

A : Insertion sort

**B : Selection sort**

C : Bubble sort

D : Merge sort

**Q.no 34. Dynamic networks of networks, is a dynamic connection that grows is called**

A : Multithreading

B : Cyber cycle

**C : Internet of things**

D : None of these

**Q.no 35. A process can be \_\_\_\_\_**

A : single threaded

B : multithreaded

**C : both single threaded and multithreaded**

D : none of the mentioned

**Q.no 36. The network topology used for interconnection network.**

A : Bus based

B : Mesh

C : Linear Array

**D : All of above**

**Q.no 37. Parallel computing uses \_\_\_\_ execution**

A : sequential

B : unique

C : simultaneous

D : none of the answers is correct

**Q.no 38. It is \_\_\_\_\_ speed and \_\_\_\_\_ latency.**

A : High, high

B : Low, low

C : High, low

D : Low, high

**Q.no 39. Which of the following is NOT a characteristic of parallel computing?**

A : Breaks a task into pieces

B : Uses a single processor or computer

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D : May use networking

**Q.no 40. Message passing system allows processes to \_\_\_\_\_**

A : communicate with one another without resorting to shared data

B : communicate with one another by resorting to shared data

C : share data

D : name the recipient or sender of the message

**Q.no 41. What is Inter process communication?**

A : allows processes to communicate and synchronize their actions when using the same address space

B : allows processes to communicate and synchronize their actions without using the same address space

C : allows the processes to only synchronize their actions without communication

D : none of the mentioned

**Q.no 42. Time complexity of bubble sort in best case is**

A :  $\theta(n)$

B :  $\theta(n \log n)$

C :  $\theta(n^2)$

D :  $\theta(n(\log n)^2)$

**Q.no 43. When the event for which a thread is blocked occurs?**

A : thread moves to the ready queue

B : thread remains blocked

C : thread completes

D : a new thread is provided

**Q.no 44. RMI stands for?**

A : Remote Mail InvocationRemote Message Invocation

B : Remaining Method Invention

C : Remaining Method Invocation

D : Remote Method Invocation

**Q.no 45. If one thread opens a file with read privileges then \_\_\_\_\_**

A : other threads in the another process can also read from that file

B : other threads in the same process can also read from that file

C : any other thread can not read from that file

D : all of the mentioned

**Q.no 46. Consider the situation in which assignment operation is very costly. Which of the following sorting algorithm should be performed so that the number of assignment operations is minimized in general?**

A : Insertion sort

B : Selection sort

C : Bubble sort

D : Merge sort

**Q.no 47. \_\_\_\_ are major issues with non-buffered blocking sends**

A : concurrent and mutual exclusion

**B : Idling and deadlocks**

C : synchronization

D : scheduling

**Q.no 48. Running merge sort on an array of size n which is already sorted is**

A :  $O(n)$

**B :  $O(n \log n)$**

C :  $O(n^2)$

D :  $O(\log n)$

**Q.no 49. The time required to create a new thread in an existing process is**

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A : greater than the time required to create a new process

**B : less than the time required to create a new process**

C : equal to the time required to create a new process

D : none of the mentioned

**Q.no 50. Network interfaces allow the transfer of messages from buffer memory to desired location without \_\_\_\_ intervention**

A : DMA

**B : CPU**

C : I/O

D : Memory

**Q.no 51. Thread synchronization is required because \_\_\_\_\_**

A : all threads of a process share the same address space

B : all threads of a process share the same global variables

C : all threads of a process can share the same files

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**Q.no 52. Which of the following are TRUE for direct communication?**

A : A communication link can be associated with N number of process(N = max. number of processes supported by system)

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A : a) there is another process R to handle and pass on the messages between P and Q

B : there is another machine between the two processes to help communication

C : there is a mailbox to help communication between P and Q

D : none of the mentioned

**Q.no 55. The architecture which can compute several tasks simultaneously at processor level itself is called as:**

A : Multi core architecture

B : Multi processor architecture

C : Multi threaded architecture

D : All of above

**Q.no 56. The amount of data that can be carried from one point to another in a given time period is called**

A : Scope

B : Capacity

C : Bandwidth

D : Limitation

**Q.no 57. Process synchronization of programs is done by**

A : input

B : output

C : operating system

D : memory

**Q.no 58. NVIDIA thought that 'unifying theme' of every forms of parallelism is the**

A : CDA thread

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**Q.no 59. The transparency that enables accessing local and remote resources using identical operations is called \_\_\_\_\_**

A : Access transparency

B : Concurrency transparency

C : Performance transparency

D : Scaling transparency

**Q.no 60. Termination of the process terminates \_\_\_\_\_**

A : first thread of the process

B : first two threads of the process

C : all threads within the process

D : no thread within the process

---

**Answer for Question No 1. is a**

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**Answer for Question No 2. is d**

---

**Answer for Question No 3. is b**

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**Answer for Question No 4. is b**

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**Answer for Question No 5. is d**

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**Answer for Question No 6. is a**

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**Answer for Question No 7. is a**

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**Answer for Question No 30. is a**

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### 11342\_High Performance Computing

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A :  $O(\log n)$

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**B : Recursive Decomposition**

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B : stack

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B : Dividing no of processors

C : Dividing number of tasks

D : Dividing number of operation

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B : Low, low

C : High, low

D : Low, high

**Q.no 36. If the given input array is sorted or nearly sorted, which of the following algorithm gives the best performance?**

A : Insertion sort

B : Selection sort

C : Bubble sort

D : Merge sort

**Q.no 37. High performance computing of the computer system tasks are done by**

A : node clusters

B : network clusters

C : both a and b

D : Beowulf clusters

**Q.no 38. If one thread opens a file with read privileges then \_\_\_\_\_**

A : other threads in the another process can also read from that file

B : other threads in the same process can also read from that file

C : any other thread can not read from that file

D : all of the mentioned

**Q.no 39. Interprocessor communication that takes place**

A : Centralized memory

B : Shared memory

C : Message passing

D : Both A and B

**Q.no 40. Which of the following is not a noncomparison sort?**

A : Counting sort

B : Bucket sort

C : Radix sort

D : Shell sort

**Q.no 41. Running merge sort on an array of size n which is already sorted is**

A :  $O(n)$

B :  $O(n \log n)$

C :  $O(n^2)$

D :  $O(\log n)$

**Q.no 42. RMI stands for?**

A : Remote Mail InvocationRemote Message Invocation

B : Remaining Method Invention

C : Remaining Method Invocation

**D : Remote Method Invocation**

**Q.no 43. The time required to create a new thread in an existing process is**

---

A : greater than the time required to create a new process

**B : less than the time required to create a new process**

C : equal to the time required to create a new process

D : none of the mentioned

**Q.no 44. Which of the ceramic components are easier through nano structuring?**

A : Lubrication

B : Coating

**C : Fabrication**

D : Wear

**Q.no 45. Parallel computing uses \_\_\_\_ execution**

A : sequential

B : unique

**C : simultaneous**

D : none of the answers is correct

**Q.no 46. \_\_\_\_\_ leads to concurrency.**

A : Serialization

**B : Parallelism**

C : Serial processing

D : Distribution

**Q.no 47. When the event for which a thread is blocked occurs?**

A : thread moves to the ready queue

B : thread remains blocked

C : thread completes

D : a new thread is provided

**Q.no 48. What is Inter process communication?**

A : allows processes to communicate and synchronize their actions when using the same address space

B : allows processes to communicate and synchronize their actions without using the same address space

C : allows the processes to only synchronize their actions without communication

D : none of the mentioned

**Q.no 49. Writing parallel programs is referred to as**

A : Parallel computation

B : Parallel processes

C : Parallel development

D : Parallel programming

**Q.no 50. the basic operations in the message-passing programming paradigm are**

---

A : initiate and listen

B : wait and acknowledge

C : request and reply

D : send and receive

**Q.no 51. Which of the following are TRUE for direct communication?**

A : A communication link can be associated with N number of process(N = max. number of processes supported by system)

B : A communication link can be associated with exactly two processes

C : Exactly  $N/2$  links exist between each pair of processes(N = max. number of processes supported by system)

D : Exactly two link exists between each pair of processes

**Q.no 52. A thread shares its resources(like data section, code section, open files, signals) with \_\_\_\_\_**

A : other process similar to the one that the thread belongs to

B : other threads that belong to similar processes

**C : other threads that belong to the same process**

D : all of the mentioned

**Q.no 53. One that is not a type of multiprocessor of the computer system is**

A : dual core

B : blade server

C : clustered system

**D : single core**

**Q.no 54. The parallelism achieved on the basis of operations is called as**

A : Instruction level

B : Thread level

**C : Transaction level**

D : None of Above

**Q.no 55. NVIDIA thought that 'unifying theme' of every forms of parallelism is the**

A : CDA thread

B : PTA thread

**C : CUDA thread**

D : CUD thread

**Q.no 56. In indirect communication between processes P and Q \_\_\_\_\_**

A : a) there is another process R to handle and pass on the messages between P and Q

B : there is another machine between the two processes to help communication

**C : there is a mailbox to help communication between P and Q**

D : none of the mentioned

**Q.no 57. Process synchronization of programs is done by**

A : input

B : output

C : operating system

D : memory

**Q.no 58. The management of data flow between computers or devices or between nodes in a network is called**

A : Flow control

B : Data Control

C : Data Management

D : Flow Management

**Q.no 59. A thread is also called \_\_\_\_\_**

A : Light Weight Process(LWP)

B : Heavy Weight Process(HWP)

C : Process

D : None of the mentioned

**Q.no 60. The parallelism achieved on the basis of conditions is called as**

A : Instruction level

B : Thread level

C : Transaction level

D : None of Above

---

**Answer for Question No 1. is c**

---

**Answer for Question No 2. is c**

---

**Answer for Question No 3. is c**

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**Answer for Question No 4. is a**

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**Answer for Question No 5. is d**

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**Answer for Question No 6. is b**

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**Answer for Question No 7. is b**

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**Answer for Question No 8. is a**

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**Answer for Question No 9. is c**

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**Answer for Question No 10. is c**

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**Answer for Question No 11. is a**

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**Answer for Question No 12. is d**

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**Answer for Question No 13. is d**

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**Answer for Question No 14. is b**

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**Answer for Question No 15. is d**

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**Answer for Question No 16. is d**

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**Answer for Question No 17. is c**

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**Answer for Question No 18. is b**

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**Answer for Question No 19. is a**

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**Answer for Question No 20. is b**

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**Answer for Question No 21. is b**

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**Answer for Question No 22. is d**

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**Answer for Question No 23. is b**

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**Answer for Question No 24. is b**

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**Answer for Question No 25. is a**

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**Answer for Question No 26. is a**

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**Answer for Question No 27. is a**

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**Answer for Question No 28. is c**

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**Answer for Question No 29. is b**

---

**Answer for Question No 30. is d**

---

**Answer for Question No 31. is a**

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**Answer for Question No 32. is c**

---

**Answer for Question No 33. is c**

---

**Answer for Question No 34. is a**

---

**Answer for Question No 35. is c**

---

**Answer for Question No 36. is b**

---

**Answer for Question No 37. is d**

---

**Answer for Question No 38. is b**

---

**Answer for Question No 39. is d**

---

**Answer for Question No 40. is d**

---

**Answer for Question No 41. is b**

---

**Answer for Question No 42. is d**

---

**Answer for Question No 43. is b**

---

**Answer for Question No 44. is c**

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**Answer for Question No 45. is c**

---

**Answer for Question No 46. is b**

---

**Answer for Question No 47. is a**

---

**Answer for Question No 48. is b**

---

**Answer for Question No 49. is d**

---

**Answer for Question No 50. is d**

---

**Answer for Question No 51. is b**

---

**Answer for Question No 52. is c**

---

**Answer for Question No 53. is d**

---

**Answer for Question No 54. is c**

---

**Answer for Question No 55. is c**

---

**Answer for Question No 56. is c**

---

**Answer for Question No 57. is c**

---

**Answer for Question No 58. is a**

---

**Answer for Question No 59. is a**

---

**Answer for Question No 60. is b**

---

Seat No -

Total number of questions : 60

### 11342\_High Performance Computing

Time : 1hr

Max Marks : 50

N.B

- 1) All questions are Multiple Choice Questions having single correct option.
  - 2) Attempt any 50 questions out of 60.
  - 3) Use of calculator is allowed.
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  - 5) Specially abled students are allowed 20 minutes extra for examination.
  - 6) Do not use pencils to darken answer.
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  - 10) Darken ONLY ONE CIRCLE for each answer.
- 

**Q.no 1. In ..... only one process at a time is allowed into its critical section, among all processes that have critical sections for the same resource.**

A : Mutual Exclusion

B : Synchronization

C : Deadlock

D : Starvation

**Q.no 2. Following is not mapping technique**

A : Static Mapping

B : Dynamic Mapping

C : Hybrid Mapping

**D : All of Above**

**Q.no 3. Depth First Search is equivalent to which of the traversal in the Binary Trees?**

A : Pre-order Traversal

B : Post-order Traversal

C : Level-order Traversal

D : In-order Traversal

**Q.no 4. Which of the following is a stable sorting algorithm?**

A : Merge sort

B : Typical in-place quick sort

C : Heap sort

D : Selection sort

**Q.no 5. Most message-passing programs are written using**

A : the single program multiple data (SPMD) model.

B : the multiple program and single data(MPSD) model

C : the single program single data (SPSD) model

D : the Multiple program multiple data (SPMD) model

**Q.no 6. The time complexity of heap sort in worst case is**

A :  $O(\log n)$

B :  $O(n)$

C :  $O(n \log n)$

D :  $O(n^2)$

**Q.no 7. Which of the following is not an application of Depth First Search?**

A : For generating topological sort of a graph

B : For generating Strongly Connected Components of a directed graph

C : Detecting cycles in the graph

D : Peer to Peer Networks

**Q.no 8. The time complexity of a quick sort algorithm which makes use of median, found by an O(n) algorithm, as pivot element is**

A :  $O(n^2)$

B :  $O(n\log n)$

C :  $O(n \log(\log(n)))$

D :  $O(n)$

**Q.no 9. Type of HPC applications of**

A : Management

B : Media mass

C : Business

D : Science

**Q.no 10. MIPS stands for?**

A : Mandatory Instructions/sec

B : Millions of Instructions/sec

C : Most of Instructions/sec

D : Many Instructions / sec

**Q.no 11. The decomposition technique in which the function is used several number of times is called as \_\_\_\_\_**

A : Data Decomposition

B : Recursive Decomposition

C : Speculative Decomposition

D : Exploratory Decomposition

**Q.no 12. Which of the following is not an application of Breadth First Search?**

A : Finding shortest path between two nodes

B : Finding bipartiteness of a graph

C : GPS navigation system

D : Path Finding

**Q.no 13. Message-passing programs are often written using**

A : symmetric Paradigm

B : asymmetric Paradigm

C : asynchronous paradigm

D : synchronous paradigm

**Q.no 14. Regarding implementation of Breadth First Search using queues, what is the maximum distance between two nodes present in the queue? (considering each edge length 1)**

A : Can be anything

B : 0

C : At most 1

D : Insufficient Information

**Q.no 15. The logical view of a machine supporting the message-passing paradigm consists of p processes, each with its own \_\_\_\_\_**

A : Partitioned Address space

B : Exclusive address space

C : Logical Adress Space

D : Non shared Adress Space

**Q.no 16. Several instructions execution simultaneously in \_\_\_\_\_**

A : processing

B : parallel processing

C : serial processing

D : multitasking

**Q.no 17. Which one of the following is not shared by threads?**

A : program counter

B : stack

C : both program counter and stack

D : none of the mentioned

**Q.no 18. How many Attributes required to characterize messsage passing paradigm**

A : 2

B : 4

C : 6

D : 8

**Q.no 19. Which of the following is not a stable sorting algorithm?**

A : Insertion sort

B : Selection sort

C : Bubble sort

D : Merge sort

**Q.no 20. Following is not decomposition technique**

A : Data Decomposition

B : Recursive Decomposition

C : Serial Decomposition

D : Exploratory Decomposition

**Q.no 21. Decomposition stands for**

A : Dividing Problem statement

B : Dividing no of processors

C : Dividing number of tasks

D : Dividing number of operation

**Q.no 22. Calling a kernel is typically referred to as \_\_\_\_\_.**

A : kernel thread

B : kernel initialization

C : kernel termination

D : kernel invocation

**Q.no 23. The decomposition technique in which the input is divided is called as \_\_\_\_\_**

A : Data Decomposition

B : Recursive Decomposition

C : Speculative Decomposition

D : Exploratory Decomposition

**Q.no 24. Which of the following is not an in-place sorting algorithm?**

A : Selection sort

B : Heap sort

C : Quick Sort

D : Merge sort

**Q.no 25. The kernel code is identified by the \_\_\_\_\_ qualifier with void return type**

A : \_host\_

B : \_global\_

C : \_device\_

D : void

**Q.no 26. Message passing system allows processes to \_\_\_\_\_**

A : communicate with one another without resorting to shared data

B : communicate with one another by resorting to shared data

C : share data

D : name the recipient or sender of the message

**Q.no 27. It is \_\_\_\_\_ speed and \_\_\_\_\_ latency.**

A : High, high

B : Low, low

C : High, low

D : Low, high

**Q.no 28. Running merge sort on an array of size n which is already sorted is**

A :  $O(n)$

B :  $O(n \log n)$

C :  $O(n^2)$

D :  $O(\log n)$

**Q.no 29. If the given input array is sorted or nearly sorted, which of the following algorithm gives the best performance?**

A : Insertion sort

B : Selection sort

C : Bubble sort

D : Merge sort

**Q.no 30. Which of the following is NOT a characteristic of parallel computing?**

A : Breaks a task into pieces

B : Uses a single processor or computer

C : Simultaneous execution

D : May use networking

**Q.no 31. What is Inter process communication?**

A : allows processes to communicate and synchronize their actions when using the same address space

B : allows processes to communicate and synchronize their actions without using the same address space

C : allows the processes to only synchronize their actions without communication

D : none of the mentioned

**Q.no 32. Network interfaces allow the transfer of messages from buffer memory to desired location without \_\_\_ intervention**

A : DMA

B : CPU

C : I/O

D : Memory

**Q.no 33. Execution of several activities at the same time.**

A : multi processing

B : parallel processing

C : serial processing

D : multitasking

**Q.no 34. When the event for which a thread is blocked occurs?**

A : thread moves to the ready queue

B : thread remains blocked

C : thread completes

D : a new thread is provided

**Q.no 35. Interprocessor communication that takes place**

A : Centralized memory

B : Shared memory

C : Message passing

D : Both A and B

**Q.no 36. \_\_\_\_\_ leads to concurrency.**

A : Serialization

B : Parallelism

C : Serial processing

D : Distribution

**Q.no 37. High performance computing of the computer system tasks are done by**

A : node clusters

B : network clusters

C : both a and b

D : Beowulf clusters

**Q.no 38. The network topology used for interconnection network.**

A : Bus based

B : Mesh

C : Linear Array

D : All of above

**Q.no 39. \_\_\_\_\_ are major issues with non-buffered blocking sends**

A : concurrent and mutual exclusion

B : Idling and deadlocks

C : synchronization

D : scheduling

**Q.no 40. The time required to create a new thread in an existing process is**

A : greater than the time required to create a new process

B : less than the time required to create a new process

C : equal to the time required to create a new process

D : none of the mentioned

**Q.no 41. A process can be \_\_\_\_\_**

A : single threaded

B : multithreaded

C : both single threaded and multithreaded

D : none of the mentioned

**Q.no 42. Broader concept offers Cloud computing .to select which of the following.**

A : Parallel computing

B : Centralized computing

C : Utility computing

D : Decentralized computing

**Q.no 43. RMI stands for?**

A : Remote Mail InvocationRemote Message Invocation

B : Remaining Method Invention

C : Remaining Method Invocation

D : Remote Method Invocation

**Q.no 44. If one thread opens a file with read privileges then \_\_\_\_\_**

A : other threads in the another process can also read from that file

B : other threads in the same process can also read from that file

C : any other thread can not read from that file

D : all of the mentioned

**Q.no 45. Writing parallel programs is referred to as**

A : Parallel computation

B : Parallel processes

C : Parallel development

D : Parallel programming

**Q.no 46. the basic operations in the message-passing programming paradigm are**

A : initiate and listen

B : wait and acknowledg

C : request and reply

D : send and receive

**Q.no 47. Parallel computing uses \_\_\_\_ execution**

A : sequential

B : unique

C : simultaneous

D : none of the answers is correct

**Q.no 48.** Consider the situation in which assignment operation is very costly. Which of the following sorting algorithm should be performed so that the number of assignment operations is minimized in general?

A : Insertion sort

B : Selection sort

C : Bubble sort

D : Merge sort

**Q.no 49.** Which of the following is not a noncomparison sort?

A : Counting sort

B : Bucket sort

C : Radix sort

D : Shell sort

**Q.no 50.** We have an internet cloud of resources In cloud computing to form

A : Centralized computing

B : Decentralized computing

C : Parallel computing

D : All of Above

**Q.no 51.** The link between two processes P and Q to send and receive messages is called \_\_\_\_\_

A : communication link

B : message-passing link

C : synchronization link

D : all of the mentioned

**Q.no 52. Process synchronization of programs is done by**

A : input

B : output

C : operating system

D : memory

**Q.no 53. One that is not a type of multiprocessor of the computer system is**

A : dual core

B : blade server

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**Q.no 54. A thread shares its resources(like data section, code section, open files, signals) with \_\_\_\_\_**

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B : other threads that belong to similar processes

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**Q.no 55. NVIDIA thought that 'unifying theme' of every forms of parallelism is the**

A : CDA thread

B : PTA thread

C : CUDA thread

D : CUD thread

**Q.no 56. Termination of the process terminates \_\_\_\_\_**

A : first thread of the process

B : first two threads of the process

C : all threads within the process

D : no thread within the process

**Q.no 57. Given a number of elements in the range [0....n^3]. which of the following sorting algorithms can sort them in O(n) time?**

A : Counting sort

B : Bucket sort

C : Radix sort

D : Quick sort

**Q.no 58. Which of the following two operations are provided by the IPC facility?**

A : write & delete message

B : delete & receive message

C : send & delete message

D : receive & send message

**Q.no 59. In indirect communication between processes P and Q \_\_\_\_\_**

A : a) there is another process R to handle and pass on the messages between P and Q

B : there is another machine between the two processes to help communication

C : there is a mailbox to help communication between P and Q

D : none of the mentioned

**Q.no 60. Octa-core processor are the processors of the computer system that contains**

A : 2 processors

B : 4 processors

C : 6 processors

D : 8 processors

---

**Answer for Question No 1. is a**

---

**Answer for Question No 2. is d**

---

**Answer for Question No 3. is a**

---

**Answer for Question No 4. is a**

---

**Answer for Question No 5. is c**

---

**Answer for Question No 6. is c**

---

**Answer for Question No 7. is d**

---

**Answer for Question No 8. is b**

---

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---

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**Answer for Question No 18. is a**

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**Answer for Question No 19. is b**

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**Answer for Question No 20. is c**

---

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**Answer for Question No 22. is d**

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**Answer for Question No 25. is b**

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**Answer for Question No 26. is a**

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---

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---

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---

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---

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---

**Answer for Question No 39. is b**

---

**Answer for Question No 40. is b**

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**Answer for Question No 41. is c**

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**Answer for Question No 42. is c**

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**Answer for Question No 44. is b**

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**Answer for Question No 45. is d**

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---

**Answer for Question No 47. is c**

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**Answer for Question No 48. is b**

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**Answer for Question No 49. is d**

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**Answer for Question No 50. is d**

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**Answer for Question No 51. is a**

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**Answer for Question No 52. is c**

---

**Answer for Question No 53. is d**

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**Answer for Question No 54. is c**

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**Answer for Question No 55. is c**

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**Answer for Question No 56. is c**

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**Answer for Question No 57. is c**

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**Answer for Question No 58. is d**

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**Answer for Question No 59. is c**

---

**Answer for Question No 60. is d**

---

Total number of questions : 60

11342\_High Performance Computing

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N.B

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- 

**Q.no 1. Which one of the following is not shared by threads?**

A : program counter

B : stack

C : both program counter and stack

D : none of the mentioned

**Q.no 2. Which of the following is not an application of Breadth First Search?**

A : Finding shortest path between two nodes

B : Finding bipartiteness of a graph

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**Q.no 7. The time complexity of heap sort in worst case is**

A :  $O(\log n)$

B :  $O(n)$

C :  $O(n \log n)$

D :  $O(n^2)$

**Q.no 8. The logical view of a machine supporting the message-passing paradigm consists of p processes, each with its own \_\_\_\_\_**

A : Partitioned Address space

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**Q.no 9. Which of the following is not an in-place sorting algorithm?**

A : Selection sort

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C : Quick Sort

D : Merge sort

**Q.no 10. Type of HPC applications of**

A : Management

B : Media mass

C : Business

D : Science

**Q.no 11. Following is not decomposition technique**

A : Data Decomposition

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A : Static Mapping

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A :  $O(n^2)$

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C :  $O(n \log(\log n))$

D :  $O(n)$

**Q.no 14. The decomposition technique in which the function is used several number of times is called as \_\_\_\_\_**

A : Data Decomposition

B : Recursive Decomposition

C : Speculative Decomposition

D : Exploratory Decomposition

**Q.no 15. How many Attributes required to characterize messsage passing paradigm**

A : 2

B : 4

C : 6

D : 8

**Q.no 16. When the Breadth First Search of a graph is unique?**

A : When the graph is a Binary Tree

B : When the graph is a Linked List

C : When the graph is a n-ary Tree

D : When the graph is a Ternary Tree

**Q.no 17. Calling a kernel is typically referred to as \_\_\_\_\_.**

A : kernel thread

B : kernel initialization

C : kernel termination

D : kernel invocation

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A : symmetric Paradigm

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C : Most of Instructions/sec

D : Many Instructions / sec

**Q.no 22. Which of the following is not a stable sorting algorithm?**

A : Insertion sort

B : Selection sort

C : Bubble sort

D : Merge sort

**Q.no 23. The decomposition technique in which the input is divided is called as \_\_\_\_\_**

A : Data Decomposition

B : Recursive Decomposition

C : Speculative Decomposition

D : Exploratory Decomposition

**Q.no 24. Most message-passing programs are written using**

A : the single program multiple data (SPMD) model.

B : the multiple program and single data(MPSD) model

C : the single program single data (SPSD) model

D : the Multiple program multiple data (SPMD) model

**Q.no 25. Depth First Search is equivalent to which of the traversal in the Binary Trees?**

A : Pre-order Traversal

B : Post-order Traversal

C : Level-order Traversal

D : In-order Traversal

**Q.no 26. RMI stands for?**

A : Remote Mail InvocationRemote Message Invocation

B : Remaining Method Invention

C : Remaining Method Invocation

D : Remote Method Invocation

**Q.no 27. Nanoscience can be studied with the help of \_\_\_\_\_**

A : Quantum mechanics

B : Newtonian mechanics

C : Macro-dynamic

D : Geophysics

**Q.no 28. It is \_\_\_\_\_ speed and \_\_\_\_\_ latency.**

A : High, high

B : Low, low

**C : High, low**

D : Low, high

**Q.no 29. A process can be \_\_\_\_\_**

A : single threaded

B : multithreaded

**C : both single threaded and multithreaded**

D : none of the mentioned

**Q.no 30. If one thread opens a file with read privileges then \_\_\_\_\_**

A : other threads in the another process can also read from that file

**B : other threads in the same process can also read from that file**

C : any other thread can not read from that file

D : all of the mentioned

**Q.no 31. Which of the ceramic components are easier through nano structuring?**

A : Lubrication

B : Coating

**C : Fabrication**

D : Wear

**Q.no 32. We have an internet cloud of resources In cloud computing to form**

A : Centralized computing

B : Decentralized computing

C : Parallel computing

D : All of Above

**Q.no 33. What is Inter process communication?**

A : allows processes to communicate and synchronize their actions when using the same address space

B : allows processes to communicate and synchronize their actions without using the same address space

C : allows the processes to only synchronize their actions without communication

D : none of the mentioned

**Q.no 34. Time complexity of bubble sort in best case is**

A :  $\theta(n)$

B :  $\theta(n \log n)$

C :  $\theta(n^2)$

D :  $\theta(n(\log n)^2)$

**Q.no 35. Consider the situation in which assignment operation is very costly. Which of the following sorting algorithm should be performed so that the number of assignment operations is minimized in general?**

A : Insertion sort

B : Selection sort

C : Bubble sort

D : Merge sort

**Q.no 36. Message passing system allows processes to \_\_\_\_\_**

A : communicate with one another without resorting to shared data

B : communicate with one another by resorting to shared data

C : share data

D : name the recipient or sender of the message

**Q.no 37. \_\_\_\_\_ leads to concurrency.**

A : Serialization

**B : Parallelism**

C : Serial processing

D : Distribution

**Q.no 38. High performance computing of the computer system tasks are done by**

A : node clusters

B : network clusters

C : both a and b

**D : Beowulf clusters**

**Q.no 39. When the event for which a thread is blocked occurs?**

**A : thread moves to the ready queue**

B : thread remains blocked

C : thread completes

D : a new thread is provided

**Q.no 40. Dynamic networks of networks, is a dynamic connection that grows is called**

A : Multithreading

B : Cyber cycle

**C : Internet of things**

D : None of these

**Q.no 41. If the given input array is sorted or nearly sorted, which of the following algorithm gives the best performance?**

A : Insertion sort

**B : Selection sort**

C : Bubble sort

D : Merge sort

**Q.no 42. Execution of several activities at the same time.**

A : multi processing

B : parallel processing

C : serial processing

D : multitasking

**Q.no 43. \_\_\_\_ are major issues with non-buffered blocking sends**

A : concurrent and mutual exclusion

B : Idling and deadlocks

C : synchronization

D : scheduling

**Q.no 44. Parallel computing uses \_\_\_\_ execution**

A : sequential

B : unique

C : simultaneous

D : none of the answers is correct

**Q.no 45. Writing parallel programs is referred to as**

A : Parallel computation

B : Parallel processes

C : Parallel development

D : Parallel programming

**Q.no 46. Which of the following is NOT a characteristic of parallel computing?**

A : Breaks a task into pieces

B : Uses a single processor or computer

C : Simultaneous execution

D : May use networking

**Q.no 47. Interprocessor communication that takes place**

A : Centralized memory

B : Shared memory

C : Message passing

**D : Both A and B**

**Q.no 48. Running merge sort on an array of size n which is already sorted is**

A :  $O(n)$

**B :  $O(n \log n)$**

C :  $O(n^2)$

D :  $O(\log n)$

**Q.no 49. Which of the following is not a noncomparison sort?**

A : Counting sort

B : Bucket sort

C : Radix sort

**D : Shell sort**

**Q.no 50. The time required to create a new thread in an existing process is**

---

A : greater than the time required to create a new process

**B : less than the time required to create a new process**

C : equal to the time required to create a new process

D : none of the mentioned

**Q.no 51. Multi-processor systems of the computer system has advantage of**

A : cost

**B : reliability**

C : uncertainty

D : scalability

**Q.no 52. The parallelism achieved on the basis of operations is called as**

A : Instruction level

B : Thread level

C : Transaction level

D : None of Above

**Q.no 53. Process synchronization of programs is done by**

A : input

B : output

C : operating system

D : memory

**Q.no 54. Octa-core processor are the processors of the computer system that contains**

A : 2 processors

B : 4 processors

C : 6 processors

D : 8 processors

**Q.no 55. Thread synchronization is required because \_\_\_\_\_**

A : all threads of a process share the same address space

B : all threads of a process share the same global variables

C : all threads of a process can share the same files

D : all of the mentioned

**Q.no 56. Data access and storage are elements of Job throughput, of \_\_\_\_\_.**

A : Flexibility

B : Adaptation

C : Efficiency

D : Dependability

**Q.no 57. Messages sent by a process \_\_\_\_\_**

A : have to be of a fixed size

B : have to be a variable size

C : can be fixed or variable sized

D : None of the mentioned

**Q.no 58. The link between two processes P and Q to send and receive messages is called \_\_\_\_\_**

A : communication link

B : message-passing link

C : synchronization link

D : all of the mentioned

**Q.no 59. Which of the following algorithms has lowest worst case time complexity?**

A : Insertion sort

B : Selection sort

C : Quick Sort

D : Heap sort

**Q.no 60. The register context and stacks of a thread are deallocated when the thread?**

A : terminates

B : blocks

C : unblocks

D : spawns

---

**Answer for Question No 1. is c**

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**Answer for Question No 2. is d**

---

**Answer for Question No 3. is c**

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**Answer for Question No 4. is a**

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**Answer for Question No 5. is b**

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**Answer for Question No 6. is d**

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**Answer for Question No 7. is c**

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**Answer for Question No 8. is b**

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**Answer for Question No 9. is d**

---

**Answer for Question No 10. is d**

---

**Answer for Question No 11. is c**

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**Answer for Question No 12. is d**

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**Answer for Question No 13. is b**

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**Answer for Question No 14. is b**

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**Answer for Question No 15. is a**

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**Answer for Question No 16. is b**

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**Answer for Question No 17. is d**

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**Answer for Question No 18. is c**

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**Answer for Question No 19. is b**

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**Answer for Question No 20. is a**

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**Answer for Question No 21. is b**

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**Answer for Question No 22. is b**

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**Answer for Question No 23. is a**

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**Answer for Question No 24. is c**

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**Answer for Question No 25. is a**

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**Answer for Question No 26. is d**

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**Answer for Question No 27. is a**

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**Answer for Question No 28. is c**

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**Answer for Question No 29. is c**

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**Answer for Question No 30. is b**

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**Answer for Question No 31. is c**

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**Answer for Question No 32. is d**

---

**Answer for Question No 33. is b**

---

**Answer for Question No 34. is a**

---

**Answer for Question No 35. is b**

---

**Answer for Question No 36. is a**

---

**Answer for Question No 37. is b**

---

**Answer for Question No 38. is d**

---

**Answer for Question No 39. is a**

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**Answer for Question No 40. is c**

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**Answer for Question No 41. is b**

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**Answer for Question No 42. is b**

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**Answer for Question No 43. is b**

---

**Answer for Question No 44. is c**

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**Answer for Question No 45. is d**

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**Answer for Question No 46. is a**

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**Answer for Question No 47. is d**

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**Answer for Question No 48. is b**

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**Answer for Question No 49. is d**

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**Answer for Question No 50. is b**

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**Answer for Question No 51. is b**

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**Answer for Question No 52. is c**

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**Answer for Question No 53. is c**

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**Answer for Question No 54. is d**

---

**Answer for Question No 55. is d**

---

**Answer for Question No 56. is c**

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**Answer for Question No 57. is c**

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**Answer for Question No 58. is a**

---

**Answer for Question No 59. is d**

---

**Answer for Question No 60. is a**

---

Total number of questions : 60

11342\_High Performance Computing

Time : 1hr

Max Marks : 50

N.B

- 1) All questions are Multiple Choice Questions having single correct option.
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  - 5) Specially abled students are allowed 20 minutes extra for examination.
  - 6) Do not use pencils to darken answer.
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  - 9) Rough work shall not be done on OMR sheet or on question paper.
  - 10) Darken ONLY ONE CIRCLE for each answer.
- 

**Q.no 1. Which one of the following is not shared by threads?**

A : program counter

B : stack

C : both program counter and stack

D : none of the mentioned

**Q.no 2. Regarding implementation of Breadth First Search using queues, what is the maximum distance between two nodes present in the queue? (considering each edge length 1)**

A : Can be anything

B : 0

C : At most 1

D : Insufficient Information

**Q.no 3. The time complexity of heap sort in worst case is**

A :  $O(\log n)$

B :  $O(n)$

C :  $O(n \log n)$

D :  $O(n^2)$

**Q.no 4. MIPS stands for?**

A : Mandatory Instructions/sec

B : Millions of Instructions/sec

C : Most of Instructions/sec

D : Many Instructions / sec

**Q.no 5. The time complexity of a quick sort algorithm which makes use of median, found by an  $O(n)$  algorithm, as pivot element is**

A :  $O(n^2)$

B :  $O(n \log n)$

C :  $O(n \log \log(n))$

D :  $O(n)$

**Q.no 6. The decomposition technique in which the input is divided is called as \_\_\_\_\_**

A : Data Decomposition

B : Recursive Decomposition

C : Speculative Decomposition

D : Exploratory Decomposition

**Q.no 7. Most message-passing programs are written using**

A : the single program multiple data (SPMD) model.

B : the multiple program and single data(MPSD) model

C : the single program single data (SPSD) model

D : the Multiple program multiple data (SPMD) model

**Q.no 8. Following is not mapping technique**

A : Static Mapping

B : Dynamic Mapping

C : Hybrid Mapping

**D : All of Above**

**Q.no 9. How many Attributes required to characterize message passing paradigm**

**A : 2**

B : 4

C : 6

D : 8

**Q.no 10. The kernel code is identified by the \_\_\_\_\_ qualifier with void return type**

A : \_host\_

**B : \_\_global\_\_**

C : \_device\_

D : void

**Q.no 11. Depth First Search is equivalent to which of the traversals in the Binary Trees?**

**A : Pre-order Traversal**

B : Post-order Traversal

C : Level-order Traversal

D : In-order Traversal

**Q.no 12. Message-passing programs are often written using**

A : symmetric Paradigm

B : asymmetric Paradigm

**C : asynchronous paradigm**

D : synchronous paradigm

**Q.no 13. Several instructions execution simultaneously in \_\_\_\_\_**

A : processing

**B : parallel processing**

C : serial processing

D : multitasking

**Q.no 14. The decomposition technique in which the function is used several number of times is called as\_\_\_\_\_**

A : Data Decomposition

**B : Recursive Decomposition**

C : Speculative Decomposition

D : Exploratory Decomposition

**Q.no 15. Which of the following is a stable sorting algorithm?**

**A : Merge sort**

B : Typical in-place quick sort

C : Heap sort

D : Selection sort

**Q.no 16. In ..... only one process at a time is allowed into its critical section, among all processes that have critical sections for the same resource.**

**A : Mutual Exclusion**

B : Synchronization

C : Deadlock

D : Starvation

**Q.no 17. Decomposition stands for**

**A : Dividing Problem statement**

B : Dividing no of processors

C : Dividing number of tasks

D : Dividing number of operation

**Q.no 18. Which of the following is not an application of Depth First Search?**

A : For generating topological sort of a graph

B : For generating Strongly Connected Components of a directed graph

C : Detecting cycles in the graph

**D : Peer to Peer Networks**

**Q.no 19. When the Breadth First Search of a graph is unique?**

A : When the graph is a Binary Tree

**B : When the graph is a Linked List**

C : When the graph is a n-ary Tree

D : When the graph is a Ternary Tree

**Q.no 20. Which of the following is not a stable sorting algorithm?**

A : Insertion sort

**B : Selection sort**

C : Bubble sort

D : Merge sort

**Q.no 21. Which of the following is not an in-place sorting algorithm?**

A : Selection sort

B : Heap sort

C : Quick Sort

**D : Merge sort**

**Q.no 22. Which of the following is not an application of Breadth First Search?**

A : Finding shortest path between two nodes

B : Finding bipartiteness of a graph

C : GPS navigation system

D : Path Finding

**Q.no 23. Calling a kernel is typically referred to as \_\_\_\_\_.**

A : kernel thread

B : kernel initialization

C : kernel termination

D : kernel invocation

**Q.no 24. The logical view of a machine supporting the message-passing paradigm consists of p processes, each with its own \_\_\_\_\_**

A : Partitioned Address space

B : Exclusive address space

C : Logical Adress Space

D : Non shared Adress Space

**Q.no 25. Type of HPC applications of**

A : Management

B : Media mass

C : Business

D : Science

**Q.no 26. Which of the following is NOT a characteristic of parallel computing?**

A : Breaks a task into pieces

B : Uses a single processor or computer

C : Simultaneous execution

D : May use networking

**Q.no 27. It is \_\_\_\_\_ speed and \_\_\_\_\_ latency.**

A : High, high

B : Low, low

C : High, low

D : Low, high

**Q.no 28. Broader concept offers Cloud computing .to select which of the following.**

A : Parallel computing

B : Centralized computing

C : Utility computing

D : Decentralized computing

**Q.no 29. \_\_\_\_\_ leads to concurrency.**

A : Serialization

B : Parallelism

C : Serial processing

D : Distribution

**Q.no 30. the basic operations in the message-passing programming paradigm are**

A : initiate and listen

B : wait and acknowledg

C : request and reply

D : send and receive

**Q.no 31. Dynamic networks of networks, is a dynamic connection that grows is called**

A : Multithreading

B : Cyber cycle

C : Internet of things

D : None of these

**Q.no 32. Running merge sort on an array of size n which is already sorted is**

A : O(n)

B :  $O(n\log n)$

C :  $O(n^2)$

D :  $O(\log n)$

**Q.no 33. The network topology used for interconnection network.**

A : Bus based

B : Mesh

C : Linear Array

D : All of above

**Q.no 34. Message passing system allows processes to \_\_\_\_\_**

A : communicate with one another without resorting to shared data

B : communicate with one another by resorting to shared data

C : share data

D : name the recipient or sender of the message

**Q.no 35. We have an internet cloud of resources In cloud computing to form**

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A : sequential

B : unique

C : simultaneous

D : none of the answers is correct

**Q.no 39. RMI stands for?**

A : Remote Mail InvocationRemote Message Invocation

B : Remaining Method Invention

C : Remaining Method Invocation

D : Remote Method Invocation

**Q.no 40. Network interfaces allow the transfer of messages from buffer memory to desired location without \_\_\_\_ intervention**

A : DMA

B : CPU

C : I/O

D : Memory

**Q.no 41. Nanoscience can be studied with the help of \_\_\_\_\_**

A : Quantum mechanics

B : Newtonian mechanics

C : Macro-dynamic

D : Geophysics

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A : node clusters

B : network clusters

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A : Parallel computation

B : Parallel processes

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**Q.no 50. \_\_\_\_\_ are major issues with non-buffered blocking sends**

A : concurrent and mutual exclusion

B : Idling and deadlocks

C : synchronization

D : scheduling

**Q.no 51. A thread is also called \_\_\_\_\_**

A : Light Weight Process(LWP)

B : Heavy Weight Process(HWP)

C : Process

D : None of the mentioned

**Q.no 52. NVIDIA thought that 'unifying theme' of every forms of parallelism is the**

A : CDA thread

B : PTA thread

C : CUDA thread

D : CUD thread

**Q.no 53. In indirect communication between processes P and Q \_\_\_\_\_**

A : a) there is another process R to handle and pass on the messages between P and Q

B : there is another machine between the two processes to help communication

C : there is a mailbox to help communication between P and Q

D : none of the mentioned

**Q.no 54. The transparency that enables accessing local and remote resources using identical operations is called \_\_\_\_\_**

A : Access transparency

B : Concurrency transparency

C : Performance transparency

D : Scaling transparency

**Q.no 55. Octa-core processor are the processors of the computer system that contains**

A : 2 processors

B : 4 processors

C : 6 processors

D : 8 processors

**Q.no 56. Given a number of elements in the range [0....n^3]. which of the following sorting algorithms can sort them in O(n) time?**

A : Counting sort

B : Bucket sort

C : Radix sort

D : Quick sort

**Q.no 57. Which of the following is not the possible ways of data exchange?**

- A : Simplex
- B : Multiplex**
- C : Half-duplex
- D : Full-duplex

**Q.no 58. The register context and stacks of a thread are deallocated when the thread?**

- A : terminates**
- B : blocks
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- A : Multithreading
- B : Cyber cycle
- C : Internet of things**
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- A : cost
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---

**Answer for Question No 1. is c**

---

**Answer for Question No 2. is c**

---

**Answer for Question No 3. is c**

---

**Answer for Question No 4. is b**

---

**Answer for Question No 5. is b**

---

**Answer for Question No 6. is a**

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**Answer for Question No 7. is c**

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**Answer for Question No 9. is a**

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**Answer for Question No 10. is b**

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**Answer for Question No 25. is d**

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**Answer for Question No 26. is a**

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**Answer for Question No 27. is c**

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**Answer for Question No 28. is c**

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**Answer for Question No 29. is b**

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**Answer for Question No 30. is d**

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**Answer for Question No 31. is c**

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**Answer for Question No 37. is b**

---

**Answer for Question No 38. is c**

---

**Answer for Question No 39. is d**

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**Answer for Question No 40. is b**

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**Answer for Question No 41. is a**

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**Answer for Question No 42. is a**

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**Answer for Question No 43. is b**

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**Answer for Question No 44. is d**

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**Answer for Question No 45. is a**

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**Answer for Question No 46. is d**

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**Answer for Question No 47. is b**

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**Answer for Question No 48. is c**

---

**Answer for Question No 49. is b**

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**Answer for Question No 50. is b**

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**Answer for Question No 51. is a**

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**Answer for Question No 52. is c**

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**Answer for Question No 53. is c**

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**Answer for Question No 54. is a**

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**Answer for Question No 55. is d**

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**Answer for Question No 56. is c**

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**Answer for Question No 57. is b**

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**Answer for Question No 58. is a**

---

**Answer for Question No 59. is c**

---

**Answer for Question No 60. is b**

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Seat No -

Total number of questions : 60

### 11342\_High Performance Computing

Time : 1hr

Max Marks : 50

N.B

- 1) All questions are Multiple Choice Questions having single correct option.
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- 

#### **Q.no 1. MIPS stands for?**

A : Mandatory Instructions/sec

**B : Millions of Instructions/sec**

C : Most of Instructions/sec

D : Many Instructions / sec

#### **Q.no 2. In ..... only one process at a time is allowed into its critical section, among all processes that have critical sections for the same resource.**

**A : Mutual Exclusion**

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A : Finding shortest path between two nodes

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C : GPS navigation system

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A : Merge sort

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C : Heap sort

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**Q.no 7. Which one of the following is not shared by threads?**

A : program counter

B : stack

C : both program counter and stack

D : none of the mentioned

**Q.no 8. Several instructions execution simultaneously in \_\_\_\_\_**

A : processing

B : parallel processing

C : serial processing

D : multitasking

**Q.no 9. When the Breadth First Search of a graph is unique?**

A : When the graph is a Binary Tree

B : When the graph is a Linked List

C : When the graph is a n-ary Tree

D : When the graph is a Ternary Tree

**Q.no 10. Message-passing programs are often written using**

A : symmetric Paradigm

B : asymmetric Paradigm

C : asynchronous paradigm

D : synchronous paradigm

**Q.no 11. How many Attributes required to characterize message passing paradigm**

A : 2

B : 4

C : 6

D : 8

**Q.no 12. Following is not mapping technique**

A : Static Mapping

B : Dynamic Mapping

C : Hybrid Mapping

D : All of Above

**Q.no 13. The time complexity of a quick sort algorithm which makes use of median, found by an O(n) algorithm, as pivot element is**

A :  $O(n^2)$

B :  $O(n \log n)$

C :  $O(n \log(\log(n)))$

D :  $O(n)$

**Q.no 14. Following is not decomposition technique**

A : Data Decomposition

B : Recursive Decomposition

C : Serial Decomposition

D : Exploratory Decomposition

**Q.no 15. Most message-passing programs are written using**

A : the single program multiple data (SPMD) model.

B : the multiple program and single data(MPSD) model

C : the single program single data (SPSD) model

D : the Multiple program multiple data (SPMD) model

**Q.no 16. The logical view of a machine supporting the message-passing paradigm consists of p processes, each with its own \_\_\_\_\_**

A : Partitioned Address space

B : Exclusive address space

C : Logical Adress Space

D : Non shared Adress Space

**Q.no 17. The time complexity of heap sort in worst case is**

A :  $O(\log n)$

B :  $O(n)$

C : O(nlogn)

D : O(n^2)

**Q.no 18. Decomposition stands for**

A : Dividing Problem statement

B : Dividing no of processors

C : Dividing number of tasks

D : Dividing number of operation

**Q.no 19. Type of HPC applications of**

A : Management

B : Media mass

C : Business

D : Science

**Q.no 20. The kernel code is identified by the \_\_\_\_\_ qualifier with void return type**

A : \_host\_

B : \_\_global\_\_

C : \_device\_

D : void

**Q.no 21. Which of the following is not a stable sorting algorithm?**

A : Insertion sort

B : Selection sort

C : Bubble sort

D : Merge sort

**Q.no 22. Which of the following is not an application of Depth First Search?**

A : For generating topological sort of a graph

B : For generating Strongly Connected Components of a directed graph

C : Detecting cycles in the graph

D : Peer to Peer Networks

**Q.no 23. Calling a kernel is typically referred to as \_\_\_\_\_.**

A : kernel thread

B : kernel initialization

C : kernel termination

D : kernel invocation

**Q.no 24. Which of the following is not an in-place sorting algorithm?**

A : Selection sort

B : Heap sort

C : Quick Sort

D : Merge sort

**Q.no 25. Depth First Search is equivalent to which of the traversal in the Binary Trees?**

A : Pre-order Traversal

B : Post-order Traversal

C : Level-order Traversal

D : In-order Traversal

**Q.no 26. Broader concept offers Cloud computing .to select which of the following.**

A : Parallel computing

B : Centralized computing

C : Utility computing

D : Decentralized computing

**Q.no 27. RMI stands for?**

A : Remote Mail InvocationRemote Message Invocation

B : Remaining Method Invention

C : Remaining Method Invocation

D : Remote Method Invocation

**Q.no 28. Dynamic networks of networks, is a dynamic connection that grows is called**

A : Multithreading

B : Cyber cycle

C : Internet of things

D : None of these

**Q.no 29. the basic operations in the message-passing programming paradigm are**

A : initiate and listen

B : wait and acknowledg

C : request and reply

D : send and receive

**Q.no 30. Which of the following is NOT a characteristic of parallel computing?**

A : Breaks a task into pieces

B : Uses a single processor or computer

C : Simultaneous execution

D : May use networking

**Q.no 31. Parallel computing uses \_\_\_\_\_ execution**

A : sequential

B : unique

C : simultaneous

D : none of the answers is correct

**Q.no 32. A process can be \_\_\_\_\_**

A : single threaded

B : multithreaded

C : both single threaded and multithreaded

D : none of the mentioned

**Q.no 33. Network interfaces allow the transfer of messages from buffer memory to desired location without \_\_\_ intervention**

A : DMA

B : CPU

C : I/O

D : Memory

**Q.no 34. High performance computing of the computer system tasks are done by**

A : node clusters

B : network clusters

C : both a and b

D : Beowulf clusters

**Q.no 35. Message passing system allows processes to \_\_\_\_\_**

A : communicate with one another without resorting to shared data

B : communicate with one another by resorting to shared data

C : share data

D : name the recipient or sender of the message

**Q.no 36. The time required to create a new thread in an existing process is**

A : greater than the time required to create a new process

B : less than the time required to create a new process

C : equal to the time required to create a new process

D : none of the mentioned

**Q.no 37. It is \_\_\_\_\_ speed and \_\_\_\_\_ latency.**

A : High, high

B : Low, low

C : High, low

D : Low, high

**Q.no 38. Which of the ceramic components are easier through nano structuring?**

A : Lubrication

B : Coating

C : Fabrication

D : Wear

**Q.no 39. \_\_\_\_\_ are major issues with non-buffered blocking sends**

A : concurrent and mutual exclusion

B : Idling and deadlocks

C : synchronization

D : scheduling

**Q.no 40. Time complexity of bubble sort in best case is**

A :  $\theta(n)$

B :  $\theta(n \log n)$

C :  $\theta(n^2)$

D :  $\theta(n(\log n)^2)$

**Q.no 41. When the event for which a thread is blocked occurs?**

A : thread moves to the ready queue

B : thread remains blocked

C : thread completes

D : a new thread is provided

**Q.no 42. If the given input array is sorted or nearly sorted, which of the following algorithm gives the best performance?**

A : Insertion sort

B : Selection sort

C : Bubble sort

D : Merge sort

**Q.no 43. If one thread opens a file with read privileges then \_\_\_\_\_**

A : other threads in the another process can also read from that file

B : other threads in the same process can also read from that file

C : any other thread can not read from that file

D : all of the mentioned

**Q.no 44. The network topology used for interconnection network.**

A : Bus based

B : Mesh

C : Linear Array

D : All of above

**Q.no 45. Execution of several activities at the same time.**

A : multi processing

B : parallel processing

C : serial processing

D : multitasking

**Q.no 46. What is Inter process communication?**

A : allows processes to communicate and synchronize their actions when using the same address space

B : allows processes to communicate and synchronize their actions without using the same address space

C : allows the processes to only synchronize their actions without communication

D : none of the mentioned

**Q.no 47. Which of the following is not a noncomparison sort?**

- A : Counting sort
- B : Bucket sort
- C : Radix sort
- D : Shell sort**

**Q.no 48. Running merge sort on an array of size n which is already sorted is**

- A :  $O(n)$
- B :  $O(n \log n)$**
- C :  $O(n^2)$
- D :  $O(\log n)$

**Q.no 49. Writing parallel programs is referred to as**

- A : Parallel computation
- B : Parallel processes
- C : Parallel development
- D : Parallel programming**

**Q.no 50. Nanoscience can be studied with the help of \_\_\_\_\_**

- A : Quantum mechanics**
- B : Newtonian mechanics
- C : Macro-dynamic
- D : Geophysics

**Q.no 51. Given a number of elements in the range  $[0....n^3]$ . which of the following sorting algorithms can sort them in  $O(n)$  time?**

- A : Counting sort
- B : Bucket sort
- C : Radix sort**
- D : Quick sort

**Q.no 52. Thread synchronization is required because \_\_\_\_\_**

- A : all threads of a process share the same address space
- B : all threads of a process share the same global variables
- C : all threads of a process can share the same files
- D : all of the mentioned**

**Q.no 53. In indirect communication between processes P and Q \_\_\_\_\_**

- A : a) there is another process R to handle and pass on the messages between P and Q
- B : there is another machine between the two processes to help communication
- C : there is a mailbox to help communication between P and Q**
- D : none of the mentioned

**Q.no 54. Which of the following is not the possible ways of data exchange?**

- A : Simplex
- B : Multiplex**
- C : Half-duplex
- D : Full-duplex

**Q.no 55. The link between two processes P and Q to send and receive messages is called \_\_\_\_\_**

- A : communication link**
- B : message-passing link
- C : synchronization link
- D : all of the mentioned

**Q.no 56. Octa-core processor are the processors of the computer system that contains**

- A : 2 processors
- B : 4 processors
- C : 6 processors

D : 8 processors

**Q.no 57. Multi-processor systems of the computer system has advantage of**

A : cost

B : reliability

C : uncertainty

D : scalability

**Q.no 58. Termination of the process terminates \_\_\_\_\_**

A : first thread of the process

B : first two threads of the process

C : all threads within the process

D : no thread within the process

**Q.no 59. The transparency that enables accessing local and remote resources using identical operations is called \_\_\_\_\_**

A : Access transparency

B : Concurrency transparency

C : Performance transparency

D : Scaling transparency

**Q.no 60. NVIDIA thought that 'unifying theme' of every forms of parallelism is the**

A : CDA thread

B : PTA thread

C : CUDA thread

D : CUD thread

---

**Answer for Question No 1. is b**

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**Answer for Question No 2. is a**

---

**Answer for Question No 3. is d**

---

**Answer for Question No 4. is c**

---

**Answer for Question No 5. is a**

---

**Answer for Question No 6. is a**

---

**Answer for Question No 7. is c**

---

**Answer for Question No 8. is b**

---

**Answer for Question No 9. is b**

---

**Answer for Question No 10. is c**

---

**Answer for Question No 11. is a**

---

**Answer for Question No 12. is d**

---

**Answer for Question No 13. is b**

---

**Answer for Question No 14. is c**

---

**Answer for Question No 15. is c**

---

**Answer for Question No 16. is b**

---

**Answer for Question No 17. is c**

---

**Answer for Question No 18. is a**

---

**Answer for Question No 19. is d**

---

**Answer for Question No 20. is b**

---

**Answer for Question No 21. is b**

---

**Answer for Question No 22. is d**

---

**Answer for Question No 23. is d**

---

**Answer for Question No 24. is d**

---

**Answer for Question No 25. is a**

---

**Answer for Question No 26. is c**

---

**Answer for Question No 27. is d**

---

**Answer for Question No 28. is c**

---

**Answer for Question No 29. is d**

---

**Answer for Question No 30. is a**

---

**Answer for Question No 31. is c**

---

**Answer for Question No 32. is c**

---

---

**Answer for Question No 33. is b**

---

**Answer for Question No 34. is d**

---

**Answer for Question No 35. is a**

---

**Answer for Question No 36. is b**

---

**Answer for Question No 37. is c**

---

**Answer for Question No 38. is c**

---

**Answer for Question No 39. is b**

---

**Answer for Question No 40. is a**

---

**Answer for Question No 41. is a**

---

**Answer for Question No 42. is b**

---

**Answer for Question No 43. is b**

---

**Answer for Question No 44. is d**

---

**Answer for Question No 45. is b**

---

**Answer for Question No 46. is b**

---

**Answer for Question No 47. is d**

---

**Answer for Question No 48. is b**

---

**Answer for Question No 49. is d**

---

**Answer for Question No 50. is a**

---

**Answer for Question No 51. is c**

---

**Answer for Question No 52. is d**

---

**Answer for Question No 53. is c**

---

**Answer for Question No 54. is b**

---

**Answer for Question No 55. is a**

---

**Answer for Question No 56. is d**

---

**Answer for Question No 57. is b**

---

**Answer for Question No 58. is c**

---

**Answer for Question No 59. is a**

---

**Answer for Question No 60. is c**

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Which of the following statements are true with regard to compute capability in CUDA

- A. Code compiled for hardware of one compute capability will not need to be re-compiled to run on hardware of another
- B. Different compute capabilities may imply a different amount of local memory per thread
- C. Compute capability is measured by the number of FLOPS a GPU accelerator can compute.

**Answer : B**

True or False: The threads in a thread block are distributed across SM units so that each thread is executed by one SM unit.

- A. True
- B. False

**Answer : B**

The style of parallelism supported on GPUs is best described as

- A. SISD - Single Instruction Single Data
- B. MISD - Multiple Instruction Single Data
- C. SIMD - Single Instruction Multiple Thread

**Answer : C**

True or false: Functions annotated with the `__global__` qualifier may be executed on the host or the device

- A. True
- B. Flase

**Answer : A**

Which of the following correctly describes a GPU kernel

- A. A kernel may contain a mix of host and GPU code
- B. All thread blocks involved in the same computation use the same kernel
- C. A kernel is part of the GPU's internal micro-operating system, allowing it to act as an independent host

**Answer : B**

Which of the following is *not* a form of parallelism supported by CUDA

- A. Vector parallelism - Floating point computations are executed in parallel on wide vector units
- B. Thread level task parallelism - Different threads execute a different tasks
- C. Block and grid level parallelism - Different blocks or grids execute different tasks
- D. Data parallelism - Different threads and blocks process different parts of data in memory

**Answer :A**

What strategy does the GPU employ if the threads within a warp diverge in their execution?

- A. Threads are moved to different warps so that divergence does not occur within a single warp
- B. Threads are allowed to diverge
- C. All possible execution paths are run by all threads in a warp serially so that thread instructions do not diverge

**Answer : C**

Which of the following does *not* result in uncoalesced (i.e. serialized) memory access on the K20 GPUs installed on Stampede

- A. Aligned, but non-sequential access
- B. Misaligned data access
- C. Sparse memory access

**Answer : A**

Which of the following correctly describes the relationship between Warps, thread blocks, and CUDA cores?

- A. A warp is divided into a number of thread blocks, and each thread block executes on a single CUDA core
- B. A thread block may be divided into a number of warps, and each warp may execute on a single CUDA core
- C. A thread block is assigned to a warp, and each thread in the warp is executed on a separate CUDA core

**Answer : B**

Shared memory in CUDA is accessible to:

- A. All threads in a single block
- B. Both the host and GPU
- C. All threads associated with a single kernel

**Answer : A**

CUDA Architecture CPU consist of

- A. CUDA Libraries
- B. CUDA Runtime
- C. CUDA Driver
- D. All Above

**Answer : D**

CUDA platform works on

- A. C
- B. C++
- C. Fortran
- D. All Above

**Answer : D**

Threads support Shared memory and Synchronization

- A. True
- B. False

**Answer : A**

Application of CUDA are

- A. Fast Video Transcoding
- B. Medical Imaging
- C. Computational Science
- D. Oil and Natural Resources exploration
- E. All Above

**Answer : E**

GPU execute device code

- A. True
- B. False

**Answer : A**

What are the issues in sorting?

- A. Where the Input and Output Sequences are Stored
- B. How Comparisons are Performed
- C. All above

**Answer : C**

The parallel run time of the formulation for Bubble sort is

- A.  $T_p = O(n/p \log n/p) + O(n) + O(n)$
- B.  $T_p = O(n/p \log n/p) + O(n/p \log p) + O(\ln n/p)$
- C. Non of the above

**Answer : A**

What are the variants of Bubble sort?

- A. Shell sort
- B. Quick sort
- C. Odd-Even transposition
- D. Option A & C

**Answer : D**

What is the overall complexity of parallel algorithm for quick sort?

- A.  $T_p = O(n/p \log n/p) + O(n/p \log p) + O(\log^2 p)$
- B.  $T_p = O(n/p \log n/p) + O(n/p \log p)$
- C.  $T_p = O(n/p \log n/p) + O(\log^2 p)$

**Answer : A**

Formally, given a weighted graph  $G(V, E, w)$ , the ***all-pairs shortest paths*** problem is to find the shortest paths between all pairs of vertices. True or False?

- A. True
- B. False

**Answer : A**

What is true for parallel formulation of Dijkstra's Algorithm?

- A. One approach partitions the vertices among different processes and has each process compute the single-source shortest paths for all vertices assigned to it. We refer to this approach as the ***source-partitioned formulation***.
- B. Another approach assigns each vertex to a set of processes and uses the parallel formulation of the single-source algorithm to solve the problem on each set of processes. We refer to this approach as the ***source-parallel formulation***.
- C. Both are true
- D. Non of these is true

**Answer : C**

Search algorithms can be used to solve discrete optimization problems. True or False ?

- A. True
- B. False

**Answer : A**

Examples of Discrete optimization problems are ;

- A. planning and scheduling,
- B. The optimal layout of VLSI chips,
- C. Robot motion planning,
- D. Test-pattern generation for digital circuits, and logistics and control.
- E. All of above

**Answer : E**

List the important parameters of Parallel DFS

- A. Work- Splitting Strategies
- B. Load balancing Schemes
- C. All of above

**Answer : C**

List the communication strategies for parallel BFS.

- A. Random communication strategy
- B. Ring communication strategy
- C. Blackboard communication strategy
- D. All of above

**Answer : D**

The lower bound on any comparison-based sort of  $n$  numbers is  $\Theta(n \log n)$

- A. True
- B. False

**Answer : A**

In a compare-split operation

- A. Each process sends its block of size  $n/p$  to the other process
- B. Each process merges the received block with its own block and retains only the appropriate half of the merged block
- C. Both A & B

**Answer : C**

In a typical sorting network

- A. Every sorting network is made up of a series of columns
- B. Each column contains a number of comparators connected in parallel
- C. Both A & B

**Answer : C**

Bubble sort is difficult to parallelize since the algorithm has no concurrency

- A. True
- B. False

**Answer : A**

What are the sources of overhead?

- A. Essential /Excess Computation
- B. Inter-process Communication
- C. Idling
- D. All above

**Answer : D**

Which are the performance metrics for parallel systems?

- A. Execution Time
- B. Total Parallel Overhead
- C. Speedup
- D. Efficiency
- E. Cost
- F. All above

**Answer : F**

The efficiency of a parallel program can be written as:  $E = Ts / pTp$ . True or False?

- A. True
- B. False

**Answer : A**

Overhead function or **total overhead** of a parallel system as the total time collectively spent by all the processing elements over and above that required by the fastest known sequential algorithm for solving the same problem on a single processing element. True or False?

- A. True
- B. False

**Answer : A**

What is Speedup?

- A. A measure that captures the relative benefit of solving a problem in parallel. It is defined as the ratio of the time taken to solve a problem on a single processing element to the time required to solve the same problem on a parallel computer with  $p$  identical processing elements.
- B. A measure of the fraction of time for which a processing element is usefully employed.
- C. None of the above

**Answer : A**

In an ideal parallel system, speedup is equal to  $p$  and efficiency is equal to one. True or False?

- A. True
- B. False

**Answer : A**

A parallel system is said to be \_\_\_\_\_ if the cost of solving a problem on a parallel computer has the same asymptotic growth (in  $\Theta$  terms) as a function of the input size as the fastest-known sequential algorithm on a single processing element.

- A. Cost optimal
- B. Non Cost optimal

**Answer : A**

Using fewer than the maximum possible number of processing elements to execute a parallel algorithm is called \_\_\_\_\_ a parallel system in terms of the number of processing elements.

- A. Scaling down
- B. Scaling up

**Answer : B**

The \_\_\_\_\_ function determines the ease with which a parallel system can maintain a constant efficiency and hence achieve speedups increasing in proportion to the number of processing elements.

- A. Isoefficiency
- B. Efficiency
- C. Scalability
- D. Total overhead

**Answer : A**

Minimum execution time for adding n numbers is  $T_p = n/p + 2 \log p$  True or False ?

- A. True
- B. False

**Answer : A**

The overhead function  $T_o = pTP - TS$ .

- A. True
- B. False

**Answer : A**

Performance Metrics for Parallel Systems: Speedup(S) = $TS/TP$

- A. True
- B. False

**Answer : A**

Matrix Vector multiplication 2D Partitions requires some basic communication operations

- A. one-to-one communication to align the vector along the main diagonal
- B. one-to-all broadcast of each vector element among the n processes of each column
- C. all-to-one reduction in each row
- D. All Above

**Answer : D**

## HPC MCQ QB for Mock Insem Examination

### Unit I

1. Conventional architectures coarsely comprise of a\_

- A. A processor
- B. Memory system
- C Data path.
- D All of Above**

2. Data intensive applications utilize\_

- A High aggregate throughput**
- B High aggregate network bandwidth
- C High processing and memory system performance.
- D None of above

3. A pipeline is like\_

- A Overlaps various stages of instruction execution to achieve performance.**
- B House pipeline
- C Both a and b
- D A gas line

4. Scheduling of instructions is determined\_

- A True Data Dependency
- B Resource Dependency
- C Branch Dependency
- D All of above**

5. VLIW processors rely on\_

- A Compile time analysis**
- B Initial time analysis
- C Final time analysis
- D Mid time analysis

6. Memory system performance is largely captured by\_

- A Latency
- B Bandwidth
- C Both a and b**
- D none of above

7. The fraction of data references satisfied by the cache is called\_

- A Cache hit ratio**
- B Cache fit ratio
- B Cache best ratio
- C none of above

8. A single control unit that dispatches the same Instruction to various processors is\_\_

- A SIMD**
- B SPMD
- C MIMD
- D None of above

9. The primary forms of data exchange between parallel tasks are\_\_

- A Accessing a shared data space
- B Exchanging messages.
- C Both A and B**
- D None of Above

10. Switches map a fixed number of inputs to outputs.

- A True**
- B False

## Unit 2

1. The First step in developing a parallel algorithm is\_\_

- A. To Decompose the problem into tasks that can be executed concurrently**
- B. Execute directly
- C. Execute indirectly
- D. None of Above

2. The number of tasks into which a problem is decomposed determines its\_\_

- A. Granularity**
- B. Priority
- C. Modernity
- D. None of above

3. The length of the longest path in a task dependency graph is called\_\_

- A. the critical path length**
- B. the critical data length
- C. the critical bit length
- D. None of above

4. The graph of tasks (nodes) and their interactions/data exchange (edges)\_

- A. Is referred to as a *task interaction graph*
  - B. Is referred to as a *task Communication graph*
  - C. Is referred to as a *task interface graph*
  - D. None of Above
5. Mappings are determined by\_
- A. task dependency
  - B. task interaction graphs
  - C. Both A and B**
  - D. None of Above
6. Decomposition Techniques are\_
- A. recursive decomposition
  - B. data decomposition
  - C. exploratory decomposition
  - D. speculative decomposition
  - E. All of Above**
7. The *Owner Computes Rule* generally states that the process assigned a particular data item is responsible for\_
- A. All computation associated with it**
  - B. Only one computation
  - C. Only two computation
  - D. Only occasionally computation
8. A simple application of exploratory decomposition is\_
- A. The solution to a 15 puzzle**
  - B. The solution to 20 puzzle
  - C. The solution to any puzzle
  - D. None of Above
9. Speculative Decomposition consist of \_
- A. conservative approaches
  - B. optimistic approaches
  - C. Both A and B**
  - D. Only B
10. task characteristics include:
- A. Task generation.
  - B. Task sizes.
  - C. Size of data associated with tasks.
  - D. All of Above**

## Unit 3

1. Group communication operations are built using point-to-point messaging primitives
  - A. **True**
  - B. False
2. Communicating a message of size  $m$  over an uncongested network takes time  $ts + tmw$ 
  - A. **True**
  - B. False
3. The dual of one-to-all broadcast is\_
  - A. **All-to-one reduction**
  - B. All-to-one receiver
  - C. All-to-one Sum
  - D. None of Above
4. A hypercube has\_
  - A.  **$2^d$  nodes**
  - B.  $2d$  nodes
  - C.  $2n$  Nodes
  - D. N Nodes
5. A binary tree in which processors are (logically) at the leaves and internal nodes are routing nodes.
  - A. **True**
  - B. False
6. In All-to-All Broadcast each processor is the source as well as destination.
  - A. **True**
  - B. False
7. The Prefix Sum Operation can be implemented using the\_
  - A. **All-to-all broadcast kernel.**
  - B. All-to-one broadcast kernel.
  - C. One-to-all broadcast Kernel
  - D. Scatter Kernel
8. In the *scatter* operation\_

- A. Single node send a unique message of size m to every other node
  - B. Single node send a same message of size m to every other node
  - C. Single node send a unique message of size m to next node
  - D. None of Above
9. The gather operation is exactly the inverse of the\_
- A. Scatter operation
  - B. Broadcast operation
  - C. Prefix Sum
  - D. Reduction operation
10. In All-to-All Personalized Communication Each node has a distinct message of size m for every other node
- A. True
  - B. False

1. It is \_\_\_\_\_ strength and \_\_\_\_\_ permeability.
- a) High, high
  - b) Low, low
  - c) High, low
  - d) Low, high
- [View Answer](#)
- Answer: c
- Explanation: It is specifically chosen so as to have particularly appropriate properties for the expected use of the structure such as high strength and low permeability.
2. High Performance concrete works out to be economical.
- a) True
  - b) False
- [View Answer](#)
- Answer: a
- Explanation: High Performance concrete works out to be economical, even though its initial cost is high.

3. HPC is not used in high span bridges.

- a) True
- b) False

[View Answer](#)

Answer: b

Explanation: Major applications of high-performance concrete in the field of Civil Engineering constructions have been in the areas of long-span bridges, high-rise buildings or structures, highway pavements, etc.

4. Concrete having 28- days' compressive strength in the range of 60 to 100 MPa.

- a) HPC
- b) VHPC
- c) OPC
- d) HSC

[View Answer](#)

Answer: a

Explanation: High Performance Concrete having 28- days' compressive strength in the range of 60 to 100 MPa.

5. Concrete having 28-days compressive strength in the range of 100 to 150 MPa.

- a) HPC
- b) VHPC
- c) OPC
- d) HSC

[View Answer](#)

Answer: b

Explanation: Very high performing Concrete having 28-days compressive strength in the range of 100 to 150 MPa.

6. High-Performance Concrete is \_\_\_\_\_ as compared to Normal Strength Concrete.

- a) Less brittle
- b) Brittle
- c) More brittle
- d) Highly ductile

[View Answer](#)

Answer: c

Explanation: High-Performance Concrete is more brittle as compared to Normal Strength Concrete (NSC), especially when high strength is the main criteria.

7. The choice of cement for high-strength concrete should not be based only on mortar-cube tests but it should also include tests of compressive strengths of concrete at \_\_\_\_\_ days.

- a) 28, 56, 91
- b) 28, 60, 90
- c) 30, 60, 90

d) 30, 45, 60

[View Answer](#)

Answer: a

Explanation: The choice of cement for high-strength concrete should not be based only on mortar-cube tests but it should also include tests of compressive strengths of concrete at 28, 56, and 91 days.

8. For high-strength concrete, a cement should produce a minimum 7-days mortar-cube strength of approximately \_\_\_\_ MPa.

- a) 10
- b) 20
- c) 30
- d) 40

[View Answer](#)

Answer: c

Explanation: For high-strength concrete, a cement should produce a minimum 7-days mortar-cube strength of approximately 30 MPa.

9. \_\_\_\_\_ mm nominal maximum size aggregates gives optimum strength.

- a) 9.5 and 10.5
- b) 10.5 and 12.5
- c) 9.5 and 12.5
- d) 11.5 and 12.5

[View Answer](#)

Answer: c

Explanation: Many studies have found that 9.5 mm to 12.5 mm nominal maximum size aggregates gives optimum strength.

10. Due to low w/c ratio \_\_\_\_\_

- a) It doesn't cause any problems
- b) It causes problems
- c) Workability is easy
- d) Strength is more

[View Answer](#)

Answer: b

Explanation: Due to the low w/c ratio, it causes problems so superplasticizers are used.

## HPC MCQ QB for Mock Insem Examination

### Unit I

1. Conventional architectures coarsely comprise of a\_

- A. A processor
- B. Memory system
- C Data path.

**D All of Above**

2. Data intensive applications utilize\_

- A High aggregate throughput**
- B High aggregate network bandwidth
- C High processing and memory system performance.
- D None of above

3. A pipeline is like\_

**A Overlaps various stages of instruction execution to achieve performance.**

- B House pipeline
- C Both a and b
- D A gas line

4. Scheduling of instructions is determined\_

A True Data Dependency

B Resource Dependency

C Branch Dependency

**D All of above**

5. VLIW processors rely on\_

A **Compile time analysis**

B Initial time analysis

C Final time analysis

D Mid time analysis

6. Memory system performance is largely captured by\_

A Latency

B Bandwidth

**C Both a and b**

D none of above

7. The fraction of data references satisfied by the cache is called\_

**A Cache *hit ratio***

B Cache *fit ratio*

B Cache *best ratio*

C *none of above*

8. A single control unit that dispatches the same instruction to various processors is\_\_

- A SIMD**
- B SPMD
- C MIMD
- D None of above

9. The primary forms of data exchange between parallel tasks are\_\_

- A Accessing a shared data space
- B Exchanging messages.
- C Both A and B**
- D None of Above

10. Switches map a fixed number of inputs to outputs.

- A True**
- B False

## **Unit 2**

1. The First step in developing a parallel algorithm is\_\_

- A. To Decompose the problem into tasks that can be executed concurrently**
- B. Execute directly

- C. Execute indirectly
  - D. None of Above
2. The number of tasks into which a problem is decomposed determines its\_
- A. **Granularity**
  - B. Priority
  - C. Modernity
  - D. None of above
3. The length of the longest path in a task dependency graph is called\_
- A. **the critical path length**
  - B. the critical data length
  - C. the critical bit length
  - D. None of above
4. The graph of tasks (nodes) and their interactions/data exchange (edges)\_
- A. **Is referred to as a *task interaction graph***
  - B. Is referred to as a *task Communication graph*
  - C. Is referred to as a *task interface graph*
  - D. None of Above
5. Mappings are determined by\_
- A. task dependency

- B. task interaction graphs
  - C. **Both A and B**
  - D. None of Above
6. Decomposition Techniques are\_
- A. recursive decomposition
  - B. data decomposition
  - C. exploratory decomposition
  - D. speculative decomposition
  - E. **All of Above**
7. The *Owner Computes Rule* generally states that the process assigned a particular data item is responsible for\_
- A. **All computation associated with it**
  - B. Only one computation
  - C. Only two computation
  - D. Only occasionally computation
8. A simple application of exploratory decomposition is\_
- A. **The solution to a 15 puzzle**
  - B. The solution to 20 puzzle
  - C. The solution to any puzzle
  - D. None of Above

9. Speculative Decomposition consist of \_

- A. conservative approaches
- B. optimistic approaches
- C. Both A and B**
- D. Only B

10. task characteristics include:

- A. Task generation.
- B. Task sizes.
- C. Size of data associated with tasks.
- D. All of Above**

## Unit 3

1. Group communication operations are built using point-to-point messaging primitives

- A. True**
- B. False

2. Communicating a message of size  $m$  over an uncongested network takes time  $ts + tmw$

- A. True**
- B. False

3. The dual of one-to-all broadcast is\_

- A. **All-to-one reduction**
- B. **All-to-one receiver**
- C. **All-to-one Sum**
- D. **None of Above**

4. A hypercube has\_

A.  **$2^d$  nodes**

- B.  $2d$  nodes
- C.  $2n$  Nodes
- D. N Nodes

5. A binary tree in which processors are (logically) at the leaves and internal nodes are routing nodes.

- A. **True**
- B. **False**

6. In All-to-All Broadcast each processor is the source as well as destination.

- A. **True**

B. False

7. The Prefix Sum Operation can be implemented using the\_

- A. **All-to-all broadcast kernel.**
- B. All-to-one broadcast kernel.
- C. One-to-all broadcast Kernel
- D. Scatter Kernel

8. In the *scatter* operation\_

- A. **Single node send a unique message of size m to every other node**
- B. Single node send a same message of size m to every other node
- C. Single node send a unique message of size m to next node
- D. None of Above

9. The gather operation is exactly the inverse of the\_

- A. **Scatter operation**
- B. Broadcast operation
- C. Prefix Sum
- D. Reduction operation

10. In All-to-All Personalized Communication Each node has a distinct message of size m for every other node

**A. True**

**B. False**

SN	Question	Option 1	Option 2
1	Any condition that causes a processor to stall is called as ____.	Hazard	Page fault
2	The time lost due to branch instruction is often referred to as ____.	Latency	Delay
3	_____ method is used in centralized systems to perform out of order execution	Scorecard	Score board
4	The computer cluster architecture emerged as an alternative for ____.	ISA	Workstation
5	NVIDIA CUDA Warp is made up of how many threads?	512	1024
6	Out-of-order instructions is not possible on GPUs.	WAHR	FALSCH
7	CUDA supports programming in ....	C or C++ or Java, Python	
8	FADD, FMAD, FMIN, FMAX are ----- supported by Scalar Processors of NVIDIA	IEEE 32-bit IEEE 32-bit integers	
9	Each streaming multiprocessor (SM) of CUDA hardware has ----- scalar processor	1024	128
10	Each NVIDIA GPU has ----- Streaming Multiprocessors	8	1024
11	CUDA provides ----- warp and thread scheduling. Also, the overhead of threads “programm” “zero-overhead”		
12	Each warp of GPU receives a single instruction and “broadcasts” it to all of its threads	SIMD (Single Instruction Multiple Data)	SIMT (Single Instruction Multiple Thread)
13	Limitations of CUDA Kernel	recursion, (No recursion)	
14	What is Unified Virtual Machine	It is a technology	It is a technology
15	_____ became the first language specifically designed by a GPU Company to Python, GPU C, CPUs.		
16	The CUDA architecture consists of ----- for parallel computing kernels and functions	RISC instructions	CISC instructions
17	CUDA stands for -----, designed by NVIDIA.	Common U	Complex U
18	The host processor spawns multithread tasks (or kernels as they are known in CUDA)	WAHR	FALSCH
19	The NVIDIA G80 is a ---- CUDA core device, the NVIDIA G200 is a ---- CUDA core	128, 256, 512, 64, 128	
20	NVIDIA 8-series GPUs offer ----- .	50-200 GF	200-400 GF
21	IADD, IMUL24, IMAD24, IMIN, IMAX are ----- supported by Scalar Processors	IEEE 32-bit IEEE 32-bit integers	
22	CUDA Hardware programming model supports: a) fully generally data-parallel	a,c,d,f	b,c,d,e
23	In CUDA memory model there are following memory types available: a) Registers	b, d, f	a, c, d, e, f
24	What is the equivalent of general C program with CUDA C: int main(void) { printf(“Hello World”); }	__global__	
25	Which function runs on Device (i.e. GPU): a) __global__ void kernel (void) {} b) a	b	b
26	A simple kernel for adding two integers: __global__ void add( int *a, int *b, int add() ) will execute add()		
27	If variable a is host variable and dev_a is a device (GPU) variable, to allocate memory	cudaMalloc( &dev_a, size );	
28	If variable a is host variable and dev_a is a device (GPU) variable, to copy input	memcpy( dev_a, a, size );	
29	Triple angle brackets mark in a statement inside main function, what does it indicate in a call from a call from		
30	What makes a CUDA code runs in parallel	__global__ main()	function
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Option 3	Option 4	Correct Ans	Level	Marks
System error	None of the above	1	1	1
Branch prediction	None of the above	3	1	1
Optimizing Redundancy	2	1	1	1
Super computation	Distributed	3	1	1
312	32	4	1	1
--	--	2	1	1
C, C++, third	Pascal	3	1	1
both	none of the above	1	1	1
512	8	4	1	1
512	16	4	1	1
64, 2 clock	32, 1 clock	2	2	2
SISD (Single	SIST (Single	2	1	1
recursion, t	No recursion	2	2	2
It is a techr	It is a techr	1	1	1
CUDA C, GF	Java, CPUs.	3	1	1
ZISC instruc	PTX instruc	4	1	1
Compute Unit	Complex Unit	3	1	1
---	---	1	1	1
64, 128, 256, 512, 1024	1	3	3	3
400-800 GF	800-1000 GF	1	1	1
both	none of the above	2	1	1
a,d,e,f	a,b,c,d,e,f	4	2	2
a, b, c, d, e, b, c, e, f		3	2	2
__global__	__global__	2	2	2
both a,b	---	1	1	1
add() will be called	add() will be called	1	1	1
cudaMalloc	malloc (void)	3	1	1
memcpy(	cudaMemcpy(	2	1	1
less than cc	greater than cc	1	1	1
Kernel name	first parameter	4	1	1

	marks	question	A	B	C	D	ans
0	1	Interconnection Networks can be classified as?	Both	Dynamic	Static	Direct Network	Both Static and Dynamic.
1	1	Parallel Computers are used to solve which types of problems.	Both	Algorithmic Problems	Optimization Problems	None	This is an explaination.
2	1	How many clocks control all the stages in a pipeline?	One	Three	Four	Five	One clock Is used to control all the stages.
3	1	Main memory in parallel computing is ____?	Shared	Parallel	Fixed	None	Main memory is shared in parallel computing.
4	1	Which of these is not a class of parallel computing architetcture?	Application Checkpointing	Distributed Computing	Symmetric Multiprocessing	Multicore Computing	Ans- (d)- Application checkpointing. is not a class of parallel computer architecture.
5	1	Parallel Computing software solutions and Techniques includes:	All	Automatic Parallelization	Parallel Programming languages.	Application Checkpointing	Parallel computing software solutionincludes all of the following.. This is an explanation
6	2	The Processors are connected to the memory through a set of?	Switches	Cables	Buses	Registers	The Processors are connected thru. the switches.
7	2	Superscalar Architetcture has how many execution units?	Two	One	Three	Four	This is an explaination.
8	2	What is used to hold the intermediate output in a pipeline	Intermediate Register	Cache	RAM	ROM	The Intermediate Registers are used to hold the output.
9	2	Which oranization performs sequencing of Human Genome?	International Human Genome Sequencing and Consortium	International Sequencing and Consortium for Human Genome	Human Genome Sequencing and Consortium, Org.	Genome Sequencing for Humans and Consortium, Org.	This is an explaination.
10	2	There are how many stages in RISC Processor?	Five	Three	Two	Six	Ans(c)- Five stages are there in a RISC processor.
11	2	Over the last decade, The DRAM access time has improved at what rate per year?	0.1	0.2	0.15	None of the above	The DRAM acess time rate has improved at a rate of 10% over the last decade.

	marks	question	A	B	C	D	ans
12	2	Which memory acts as low-latency high bandwidth storage?	Cache	Register	DRAM	EPROM	Cache acts as low latency high bandwidth storage .This is an explanation.
13	2	Which processor architecture is this?	SIMD	MIMD	MISD	MIMD	This is an explaination.
14	2	Which core processor is this?	Quad-Core	Dual-Core	Octa-Core	Single-Core	This diagram shows Quad-Core.
15	2	Which of these is not a scalable design principle?	Data Caching	Decomposition	Simplification	Parsimony	Data Caching is not a principle of scable design.
16	2	The distance between any two nodes in Bus Based network is?	O(1)	O(n Logn)	O(N)	O(n^2)	O(1) is the ditance between any two nodes.
17	2	Early SIMD computers include:	All	MPP	CM-2	Illiac IV	All of these are early staged SIMD parallel computers.
18	2	This is which configuration in Omega networks.	Pass-through	Cross-Over	Shuffle	None	This is called Pass-through configuration.
19	2	Automatic Parallelization technique doesn't includes:	Share Memory	Analyse	Schedule	Parse	Parallelization includes parse, analyse schedule and code generation.
20	2	The Pentium 4 or P4 processor has how many stage pipeline?	20	15	18	10	The P4 processor has 20 staged pipeline. This is an explanation.
21	3	Which protocol is not used to remove concurrent writes?	Identify	Priority	Common	Sum	Sum, Priority and common are used to remove concurrent writes.
22	3	EREW PRAM stands for?	Exclusive Read and Exclusive Write	Erasable Read and Erasable Write PRAM	Easily Read and Easily Write	None	EREW stands for Exclusive Read and Exclsiuve Write PRAM.
23	3	During each clock cycle, multiple instructions are piped into the processor in_____?	Parallel	Series	Both a and b	None	Multiple Instuctiön are piped in parallel. This is an explanation.
24	3	Which Interconnection Network uses this equation.	Multistage Networks	Cross-Bar	Dynamic Networks	Bus-Staged	Multistaged Network uses this eqn.

	marks	question	A	B	C	D	ans
25	3	How many types of parallel computing are available from both proprietary and open source parallel computing vendors?	4	2	3	6	There are generally four types of parallel computing, available from both proprietary and open source parallel computing vendors.
26	3	If a piece of data is repeatedly used, the effective latency of this memory system can be reduced by the cache. The fraction of data references satisfied by the cache is called?	Hit Ratio	Memory ratio	Hit Fraction	Memory Fraction.	If a piece of data is repeatedly used, the effective latency of this memory system can be reduced by the cache. The fraction of data references satisfied by the cache is called the cache hit ratio.
27	3	Superscalar Architecture can create problem in?	Scheduling	Phasing	Data Extraction	Data-Compiling	Superscalar Architecture can cause problems in CPU scheduling.
28	3	In cut-through routing, a message is broken into fixed size units called?	Flits	Flow Digits	Control Digits	All	In cut-through routing, a message is broken into fixed size units called flits.
29	3	The total communication time for cut-through routing is?	A	B	C	D	This is an explanation.
30	1	The Disadvantage of GPU Pipeline is?	Load-balancing	Data balancing	Process balancing	All of the above	This is an explanation.
31	1	Examples of GPU Processors are:	Both	AMD Processors	NVIDIA	None	Both AMD and NVIDIA.
32	1	Simultaneous execution of different programs on a data stream is called?	Stream Parallelism	Data Execution	Data-parallelism	None	Simultaneous execution of different programs on a data stream is called Stream Parallelism.
33	1	Early GPU controllers were known as?	Video Shifters	GPU Shifters	GPU Controllers	Video-Movers	This is an Explanation.
34	1	_____ development is a critical component of problem solving using computers?	Algorithm	Code	Pseudocode	Problem	Algorithm development is a critical component of problem solving using computers

	marks	question	A	B	C	D	ans
35	1	GPU stands for?	Graphics Processsing Unit	Graphical Processing Unit	Gaming Processing Unit	Graph Processing Unit	This is an Explaination.
36	1	What leads to concurrency?	Parallelism	Serial Processing	Decomposition	All	Parallelism leads naturally to Concurrency. For example, Several processes trying to print a file on a single printer.
37	2	The process of determining which screen-space pixel locations are covered by each\triangle is known as?	Rasterization	Pixelisation	Fragmentation	Space-Determining Process	Rasterization is the process of determining which screen-space pixel locations are covered by each\triangle.
38	2	The programmable units of the GPU follow which programming model?	SPMD	MISD	MIMD	SIMD	The programmable units of the GPU follow a single program multiple-data (SPMD) programming model.
39	2	Which space can ease the programming effort, especially if the distribution of data is different in different phases of the algorithm?	Shared Address	Parallel Address	Data- Address	Series-Address	Shared Address space can ease the programming effort, especially if the distribution of data is different in different phases of the algorithm.
40	2	Which are the hardware units that physically perform computations?	Processssor	ALU	CPU	CU	Processors are the hardware units that physically perform computations
41	2	Examples of Graphics API are?	All	DirectX	CUDA	Open-CL	All of the these are examples of Graphics API
42	2	The mechanism by which tasks are assigned to processes for execution is called ____?	Mapping	Computation	Process	None	The mechanism by which tasks are assigned to processes for execution is called mapping.

	marks	question	A	B	C	D	ans
43	2	A decomposition into a large number of small tasks is called _____ granularity.	Fine- grained	Coarse-grained	Vector-granied	All	A decomposition into a large number of small tasks is called fine-grained granularity.
44	2	Identical operations being applied concurrently on different data items is called?	Data- Parallelism	Parallelism	Data Serialsm	Concurrency	Identical operations being applied concurrently on different data items is called Data Parallelism.
45	2	System which do not have parallel processsing capabiities?	SISD	SIMD	MISD	MIMD	This is the explainantion.
46	2	The time and the location in the program of a static one-way interaction is known as ?	Priori	Polling	Decomposition	Execution	The time and the location in the program of a static one-way interaction is known a priori.
47	2	Memory access in RISC architecture is limited to which instructions?	STA and LDA	CALL and RET	Push and POP	MOV and JMP	This is the explaination.
48	2	Which Algorithms can be implemented in both shared-address-space and message-passing paradigms?	Data-Parallel Algo.	Quick-Sort Algo.	Data Algorithm	Bubble Sort Algo.	Data Parallel algorithms can be implemented in both shared-address-space and message-passing paradigms
49	2	Which type of Distribution is this?	Randomized Block Distribution	Block-Cyclic Distribution	Cyclic Distribution	None	This figure shows Randomized Block Distribution.
50	2	An abstraction used to express such dependencies among tasks and their relative order of execution is known as _____?	Task- Dependency Graph.	Dependency Graph.	Time- Dependency Graph	None	An abstraction used to express such dependencies among tasks and their relative order of execution is known as a task-dependency graph.

	marks	question	A	B	C	D	ans
51	3	Which is the simplest way to distribute an array and assign uniform contiguous portions of the array to different processes?	Block Distribution	Array Distribution	Process Distribution	All	Block distributions are some of the simplest ways to distribute an array and assign uniform contiguous portions of the array to different processes
52	3	An example of a decomposition with a regular interaction pattern is?	Image-dithering problem.	Travelling Salesman Problem	Time-complexity Problems	8 Queen problem.	An example of a decomposition with a regular interaction pattern is the problem of image dithering.
53	3	A feature of a task-dependency graph that determines the average degree of concurrency for a given granularity is	Critical-path	Process-path	Granularity.	Concurrency	A feature of a task-dependency graph that determines the average degree of concurrency for a given granularity is critical path.
54	3	The shared-address-space programming paradigms can handle which interactions?	Both	Two way	One way	None	The shared-address-space programming paradigms can handle both one-way and two-way interactions.
55	3	Which distribution can result in an almost perfect load balance due to the extreme fine-grained underlying decomposition.	Cyclic Distribution.	Array Distribution	Block-Cyclic Distribution	Block Distribution.	Cyclic Distribution can result in an almost perfect load balance due to the extreme fine-grained underlying decomposition.
56	3	Data sharing interactions can be categorized as _____ interactions?	Both	Read-Write	Read only	None	Data sharing interactions can be categorized as either read-only or read-write interactions

	marks	question	A	B	C	D	ans
57	3	What is the way of structuring a parallel algorithm by selecting a decomposition and mapping technique and applying the appropriate strategy to minimize interactions called?	Algorithm Model	Parallel Model	Data Model	Mapping Model	Algo. Model is a way of structuring a parallel algorithm by selecting a decomposition and mapping technique and applying the appropriate strategy to minimize interactions.
58	3	Which Algorithm is this?	Serial column based Algo.	Column-Algorithm	Bubble Sort Algo.	None.	This is Serial Column based algorithm.
59	3	Algorithms based on the task graph model include:	All	Matrix-Factorization	Parallel QuickSort	Quicksort	This is an Explaination.
60	1	Which model permits simultaneous communication on all the channels connected to a node?	All-port communication	One-port communication	Dual-port communication	Quad-port communication	All-port communication model permits simultaneous communication on all the channels connected to a node.
61	1	A process sends the same m-word message to every other process, but different processes may broadcast different messages. It is called?	All to All Broadcast	One to All Broadcast	All to All Reduction	None	This is an Explaination.
62	1	The Matrix is transposed using which operation?	All to All personalized communication	One-to-all personalized communication	All-to-one personalized communication	One to one personalized communication.	This is an Explaination.
63	1	Each node in a two-dimensional wraparound mesh has how many ports?	Four	Two	Three	One	Each node in a two-dimensional wraparound mesh has four ports
64	1	Circular shift is a member of a broader class of global communication operations known as?	Permutation	Combination.	Both a and b	None	This is ann explaination.
65	1	We define _____ as the operation in which node i sends a data packet to node $(i + q) \bmod p$ in a p-node ensemble ( $0 < q < p$ ).	Circular q-shift	Linear shift	Circular shift	Linear q-shift.	We define a circular q-shift as the operation in which node i sends a data packet to node $(i + q) \bmod p$ in a p-node ensemble ( $0 < q < p$ ).

	marks	question	A	B	C	D	ans
66	1	Parallel algorithms often require a single process to send identical data to all other processes or to a subset of them. This operation is known as?	One to All Broadcast	One to One Broadcast	All to One Broadcast	None	Parallel algorithms often require a single process to send identical data to all other processes or to a subset of them. This operation is known as One to All Broadcast.
67	1	In which Communication each node sends a distinct message of size m to every other node?	All to All personalized communication	One to One personalized communication	All-to-one personalized communication	One-to-all personalized communication.	This is an Explaination.
68	1	All to All personalized communication operation is not used in a which of these parallel algorithms?	Quick Sort	Matrix-Transpose	Fourier Transformation	Database Join operation	This is an Explaination.
69	1	The Dual of one-to-all broadcast is?	All to one Reduction	All to one Broadcast	One to Many Reduction	All to All Broadcast	The dual of one to all Broadcast is called all to one reduction.
70	1	Reduction on a linear array can be performed by _____ the direction and the sequence of communication?	Reversing	Forwarding	Escaping	Widening	Reduction on a linear array can be performed by simply reversing the direction and the sequence of communication
71	2	This equation is used to solve which topology operations in all to all communications?	Hypercube	Mesh	Ring	Linear-Array	This is an Explaination.
72	2	\nThe communication pattern of all-to-all broadcast can be used to perform _____?	Third Variation of Reduction	Second Variation of Reduction	First Variation of Reduction	Fifth Variation of Reduction	This is an Explaination.
73	2	A single node sends a unique message of size m to every other node. This operation is known as _____?	Scatter	Reduction	Gather	Concatenate	In the scatter operation, a single node sends a unique message of size m to every other node.
74	2	The Algorithm represents which broadcast?	All to All Broadcast	All to All Broadcast	All to All Reduction	One to One Reduction	This is an explanation.
75	2	The message can be broadcast in how many steps?	Log(p)	Log( $p^2$ )	One	Sin(p)	The message can be broadcast in log p steps.
76	2	This equation is used to solve which operations?	All to All personalized communication	One-to-all personalized communication	One to one personalized communication	All-to-one personalized communication.	This is an Explaination.

	marks	question	A	B	C	D	ans
77	2	There are how many computations for $n^2$ words of data transferred among the nodes?	$N^3$	Tan n	$E^n$	Log n	There are $n^3$ computations for $n^2$ words of data transferred among the nodes.
78	2	Scatter Operation is also known as?	One-to-all personalized communication	One-to-one personalized communication	All-to-one personalized communication	All-to-all personalized communication.	Scatter operation is also known as One-to-all personalized communication.
79	2	A Hypercube with 2d nodes can be regarded as a d-dimensional mesh with _____ nodes in each dimension.	Two	One	Three	Four	A hypercube with 2d nodes can be regarded as a d-dimensional mesh with two nodes in each dimension
80	2	One-to-all broadcast and all-to-one reduction are used in several important parallel algorithms including?	All	Gaussian Elimination	Shortest path Algo.	Matrix- Vector multiplication	This is an Explanation.
81	2	Each node of the distributed-memory parallel computer is a _____ shared-memory multiprocessor.	NUMA	UMA	CCMA	None	Each node of the distributed-memory parallel computer is a NUMA shared-memory multiprocessor.
82	2	To perform a q-shift, we expand q as a sum of distinct powers of _____?	2	3	e	Log p	To perform a q-shift, we expand q as a sum of distinct powers of 2 .
83	3	In which implementation of circular shift, the entire row to data set is shifted by	Mesh	Hypercube	Ring	Linear	This is an Explanation
84	3	On a p-node hypercube with all-port communication, the coefficients of tw in the expressions for the communication times of one-to-all and all-to-all broadcast and personalized communication are all smaller than their single-port counterparts by a factor of?	Log(p)	Cos(p)	Sin(p)	$E^p$	On a p-node hypercube with all-port communication, the coefficients of tw in the expressions for the communication times of one-to-all and all-to-all broadcast and personalized communication are all smaller than their single-port counterparts by a factor of $\log p$ .

	marks	question	A	B	C	D	ans
85	3	The Equation represents which analysis in All to All Broadcasts?	Cost Analysis	Time Analysis	Data Model Analysis	Space- Time Analysis	Ans-(c) Cost Analysis.
86	3	On a p-node hypercube, the size of each message exchanged in the i th of the log p steps is?	A	B	C	D	A
87	3	Which broadcast is applied on this 3D hypercube?	One to All Broadcast	One to One Broadcast	All to One Broadcast	All to one Reduction	This figure shows One to All Broadcast being applied on 3D hypercube.
88	3	The Equation represents which analysis in One to All Broadcasts?	Cost Analysis	Time Analysis	Data Analysis	Space Analysis	This is an explanation.
89	3	The time for circular shift on a hypercube can be improved by almost a factor of _____ for large messages.	Log p	Cos(p)	$e^p$	sin p	The time for circular shift on a hypercube can be improved by almost a factor of $\log p$ for large messages.
90	1	The execution time of parallel algorithm doesn't depends upon?	Processor	Input Size	Relative computation	Communication speed	The execution time of a parallel algorithm depends not only on input size but also on the number of processing elements used, and their relative computation and interprocess communication speeds.
91	1	Processing elements in a parallel system may become idle due to many reasons such as:	Both	Synchronization	Load Imbalance	The processing element doesn't become idle.	Both synchronization and load imbalance
92	1	If the scaled-speedup curve is close to linear with respect to the number of processing elements, then the parallel system is considered as?	Scalable	Iso-scalable	Non-Scalable	Scale-Efficient	If the scaled-speedup curve is close to linear with respect to the number of processing elements, then the parallel system is considered scalable

	marks	question	A	B	C	D	ans
93	1	Which system is the combination of an algorithm and the parallel architecture on which it is implemented?	Parallel System	Data- Parallel System	Architecture System	Series System	A parallel system is the combination of an algorithm and the parallel architecture on which it is implemented
94	1	What is defined as the speedup obtained when the problem size is increased linearly with the number of processing elements?	Scalable Speedup	Unscalable Speedup	Superlinearity Speedup	Isoefficiency Speedup	Scalable Speedup defined as the speedup obtained when the problem size is increased linearly with the number of processing elements
95	1	The maximum number of tasks that can be executed simultaneously at any time in a parallel algorithm is called its degree of _____.	Concurrency	Parallelism	Linearity	Execution	The maximum number of tasks that can be executed simultaneously at any time in a parallel algorithm is called its degree of concurrency.
96	1	The isoefficiency due to concurrency in 2-D partitioning is:	$O(p)$	$O(n \log p)$	$O(1)$	$O(n^2)$	This is an explanation.
97	2	The total time collectively spent by all the processing elements over and above that required by the fastest known sequential algorithm for solving the same problem on a single processing element is known as?	Total Overhead	Overhead	Serial Runtime	Parallel Runtime	We define total overhead of a parallel system as the total time collectively spent by all the processing elements over and above that required by the fastest known sequential algorithm for solving the same problem on a single processing element.
98	2	Parallel computations involving matrices and vectors readily lend themselves to data _____.	Decomposition	Composition	Linearity	Parallelism	Parallel computations involving matrices and vectors readily lend themselves to data decomposition.

	marks	question	A	B	C	D	ans
99	2	Parallel 1-D with Pipelining is a _____ algorithm?	Synchronous	Asynchronous	Optimal	Cost-optimal	This is an explanation.
100	2	The serial complexity of Matrix-Matrix Multiplication is:	$\tilde{O}(n^3)$	$O(n^2)$	$O(n)$	$O(n \log n)$	This is an explanation
101	2	What is the problem size for $n \times n$ matrix multiplication?	$\tilde{I}(n^3)$	$\tilde{I}(n \log n)$	$\tilde{I}(n^2)$	$\tilde{I}(1)$	$\tilde{I}(n^3)$ is the problem size.
102	2	The given equation represents which function?	Overhead Function	Parallel Model	Series Overtime	Parallel Overtime	This is an explanation.
103	2	The efficiency of a parallel program can be written as:	A	B	C	D	A
104	2	The total number of steps in the entire pipelined procedure is _____?	$\hat{I}(n)$	$\hat{I}(n^2)$	$\hat{I}(n^3)$	$\hat{I}(1)$	The total number of steps in the entire pipelined procedure is $\hat{I}(n)$
105	2	In Canon's Algorithm, the memory used is?	$\hat{I}(n^2)$	$\hat{I}(n)$	$\hat{I}(n^3)$	$\hat{I}(n \log n)$	This is an explanation.
106	2	Consider the problem of multiplying two $n \times n$ dense, square matrices A and B to yield the product matrix C =:	$A \tilde{\times} B$	$A/B$	$A+B$	$A-B$	Consider the problem of multiplying two $n \times n$ dense, square matrices A and B to yield the product matrix $C = A \tilde{\times} B$ .
107	2	The serial runtime of multiplying a matrix of dimension $n \times n$ with a vector is?	A	B	C	D	A
108	2	_____ is a measure of the fraction of time for which a processing element is usefully employed.	Efficiency	Linearity	Overtime Function	Superlinearity	Efficiency is a measure of the fraction of time for which a processing element is usefully employed.
109	2	When the work performed by a serial algorithm is greater than its parallel formulation or due to hardware features that put the serial implementation at a disadvantage. This phenomena is known as?	Superlinear Speedup	Linear Speedups	Super Linearity	Performance Metrics	This is an explaintion
110	3	The all-to-all broadcast and the computation of $y[i]$ both take time?	$\tilde{I}(n)$	$\tilde{I}(n \log n)$	$\tilde{I}(n^2)$	$\tilde{I}(n^3)$	This is an explanation.

	marks	question	A	B	C	D	ans
111	3	If virtual processing elements are mapped appropriately onto physical processing elements, the overall communication time does not grow by more than a factor of	N/p	P/n	N+p	N*p	If virtual processing elements are mapped appropriately onto physical processing elements, the overall communication time does not grow by more than a factor of n/p
112	3	Parallel execution time can be expressed as a function of problem size, overhead function, and the number of processing elements. The Formed eqn is:	A	B	C	D	A
113	3	In 2-D partitioning, the first alignment takes time=?	$T_s + \frac{t_w n}{p}$	$T_s - \frac{t_w n}{p}$	$T_s * \frac{t_w n}{p}$	$T_s / \frac{t_w n}{p}$	$T_s + \frac{t_w n}{p}$
114	3	Using fewer than the maximum possible number of processing elements to execute a parallel algorithm is called _____?	Scaling Down	Scaling up	Scaling	Stimulation	Using fewer than the maximum possible number of processing elements to execute a parallel algorithm is called scaling down.
115	3	Which of the following is a drawback of matrix matrix multiplication?	Memory Optimal	Efficient	Time-bound	Complex	This is an explanation
116	3	Consider the problem of sorting 1024 numbers ( $n = 1024$ , $\log n = 10$ ) on 32 processing elements. The speedup expected is	$P/\log n$	$P * \log n$	$P + \log n$	$N * \log p$	Consider the problem of sorting 1024 numbers ( $n = 1024$ , $\log n = 10$ ) on 32 processing elements. The speedup expected is $p/\log n$
117	3	Consider the problem of adding $n$ numbers on $p$ processing elements such that $p < n$ and both $n$ and $p$ are powers of 2. The overall parallel execution time of the problem is:	$\hat{e}^{TM}((n/p) \log p)$ .	$\hat{e}^{TM}((n*p) \log p)$ .	$\hat{e}^{TM}((p/n) \log p)$ .	$\hat{e}^{TM}((n) \log p)$ .	Ans-(a)- $\hat{e}^{TM}((n/p) \log p)$ .
118	3	DNS algorithm has _____ runtime?	$\hat{a},(n)$	$\hat{a},(n^2)$	$\hat{a},(n^3)$	$\hat{a},(\log n)$	DNS has $\hat{a},(n)$ runtime

	marks	question	A	B	C	D	ans
119	3	The serial algorithm requires _____ multiplications and additions in matrix-vector multiplication.\n\n	$N^2$	$N^3$	$\log n$	$N\log(n)$	Ans-(b)- $n^2$ . The serial algorithm requires $n^2$ multiplications and additions.\n\n
120	1	The time required to merge two sorted blocks of $n/p$ elements is _____? \n\n	$\hat{O}(n/p)$	$\hat{O}(n)$	$\hat{O}(p/n)$	$\hat{O}(n\log p)$	The time required to merge two sorted blocks of $n/p$ elements is $\hat{O}(n/p)$ . \n\n
121	1	In Parallel DFS, the stack is split into two equal pieces such that the size of the search space represented by each stack is the same. Such a split is called?.	Half-Split	Half-Split	Parallel-Split	None	The stack is split into two equal pieces such that the size of the search space represented by each stack is the same. Such a split is called a half-split.
122	1	To avoid sending very small amounts of work, nodes beyond a specified stack depth are not given away. This depth is called the _____ depth.	Cut-Off	Breakdown	Full	Series	To avoid sending very small amounts of work, nodes beyond a specified stack depth are not given away. This depth is called the cutoff depth.
123	1	In sequential sorting algorithms, the input and the sorted sequences are stored in which memory?	Process Memory	Secondary Memory	Main Memory	External Memory	In sequential sorting algorithms, the input and the sorted sequences are stored in the process's memory
124	1	Each process sends its block to the other process. Now, each process merges the two sorted blocks and retains only the appropriate half of the merged block. We refer to this operation as?	Compare-Split	Split	Compare	Exchange.	Each process sends its block to the other process. Now, each process merges the two sorted blocks and retains only the appropriate half of the merged block. We refer to this operation as compare-split.

	marks	question	A	B	C	D	ans
125	1	Each process compares the received element with its own and retains the appropriate element. We refer this operation as _____?	Compare Exchange	Exchange	Process-Exchange	All	Each process compares the received element with its own and retains the appropriate element. We refer this as compare exchange.
126	1	Which algorithm maintains the unexpanded nodes in the search graph, ordered according to their l-value?	Parallel BFS	Parallel DFS	Both a and b	None	Parallel BFS maintains the unexpanded nodes in the search graph, ordered according to their l-value.
127	1	The critical issue in parallel depth-first search algorithms is the distribution of the search space among the _____?	Processor	Space	Memory	Blocks	The critical issue in parallel depth-first search algorithms is the distribution of the search space among the processors
128	2	Enumeration Sort uses how many processes to sort n elements?	$N^2$	Logn	$N^3$	N	This is an explanation.
129	2	Which sequence is a sequence of elements $\langle a_0, a_1, \dots, a_{n-1} \rangle$ with the property that either (1) there exists an index $i, 0 \leq i \leq n - 1$ , such that $\langle a_0, \dots, a_i \rangle$ is monotonically increasing and $\langle a_{i+1}, \dots, a_{n-1} \rangle$ is monotonically decreasing, or (2) there exists a cyclic shift of indices so that (1) is satisfied.	Bitonic Sequence	Acyclic Sequence	Asymptotic Sequence	Cyclic Sequence.	A bitonic sequence is a sequence of elements $\langle a_0, a_1, \dots, a_{n-1} \rangle$ with the property that either (1) there exists an index $i, 0 \leq i \leq n - 1$ , such that $\langle a_0, \dots, a_i \rangle$ is monotonically increasing and $\langle a_{i+1}, \dots, a_{n-1} \rangle$ is monotonically decreasing, or (2) there exists a cyclic shift of indices so that (1) is satisfied

	marks	question	A	B	C	D	ans
130	2	To make a substantial improvement over odd-even transposition sort, we need an algorithm that moves elements long distances. Which one of these is such serial sorting algorithm?	Shell Sort	Linear Sort	Quick-Sort	Bubble Sort	To make a substantial improvement over odd-even transposition sort, we need an algorithm that moves elements long distances. Shellsort is one such serial sorting algorithm.
131	2	Quick-Sort is a _____ algorithm?	Divide and Conquer	Greedy Approach	Both a and b	None	Quicksort is a Divide and Conquer algorithm.
132	2	The _____ transposition algorithm sorts n elements in n phases (n is even), each of which requires n/2 compare-exchange operations.	Odd-Even	Odd	Even	None	This is an explaination.
133	2	The average time complexity for Bucket Sort is?	$O(n+k)$	$O(n \log(n+k))$	$O(n^3)$	$\hat{O}(n^2)$	The average time complexity for Bucket Sort is $O(n + k)$ .
134	2	A popular serial algorithm for sorting an array of n elements whose values are uniformly distributed over an interval $[a, b]$ is which algorithm?	Bucket Sort	Quick-Sort Algo.	Linear Sort	Bubble-Sort	A popular serial algorithm for sorting an array of n elements whose values are uniformly distributed over an interval $[a, b]$ is the bucket sort algorithm
135	2	Best Case time complexity of Bubble Sort is:	$O(n)$	$O(n^3)$	$O(n \log n)$	$O(n^2)$	Best case complexity of bubblesort is $O(n)$ .

	marks	question	A	B	C	D	ans
136	2	When more than one process tries to write to the same memory location, only one arbitrarily chosen process is allowed to write, and the remaining writes are ignored. This process is called _____ in quick sort.	CRCW-PRAM	PRAM	Partitioning	CRCW	When more than one process tries to write to the same memory location, only one arbitrarily chosen process is allowed to write, and the remaining writes are ignored. It is called CRCW PRAM quick sort algo.
137	2	Average Time Complexity in a quicksort algorithm is:	$O(n \log n)$	$O(n)$	$O(n^3)$	$\hat{O}(n^2)$	This is an explaination.
138	2	The isoefficiency function of Global Round Robin (GRR) is:	$O(p^2 \log p)$	$O(p \log p)$	$O(\log p)$	$O(p^2)$	The isoefficiency function of GRR is $O(p^2 \log p)$
139	2	A _____ is a device with two inputs x and y and two outputs $x'$ and $y'$ in a Sorting Network.	Comparator	Router	Separator	Switch.	A comparator is a device with two inputs x and y and two outputs $x'$ and $y'$
140	2	If T is a DFS tree in G then the parallel implementation of the algorithm runs in _____ time complexity.	$O(t)$	$O(t \log n)$	$O(\log t)$	$O(1)$	If T is a DFS tree in G then the parallel implementation of the algorithm outputs a proof that can be verified in $O(t)$ time complexity.
141	2	In the quest for fast sorting methods, a number of networks have been designed that sort n elements in time significantly smaller than _____?	$\hat{O}(n \log n)$	$\hat{O}(n)$	$\hat{O}(1)$	$\hat{O}(n^2)$	In the quest for fast sorting methods, a number of networks have been designed that sort n elements in time significantly smaller than $\hat{O}(n \log n)$ .
142	2	The average value of the search overhead factor in parallel DFS is less than _____?	One	Two	Three	Four	The average value of the search overhead factor in parallel DFS is less than one
143	3	Parallel runtime for Ring architecture in a bitonic sort is:	$\hat{O}(n)$	$\hat{O}(n \log n)$	$\hat{O}(n^2)$	$\hat{O}(n^3)$	Parallel runtime for Ring architecture in a bitonic sort is $\hat{O}(n)$

	marks	question	A	B	C	D	ans
144	3	The Sequential Complexity of Odd-Even Transposition Algorithm is:	$\hat{O}(n^2)$	$\hat{O}(n\log n)$	$\hat{O}(n^3)$	$\hat{O}(n)$	This is an explanation.
145	3	The Algorithm represents which bubble sort:	Sequential Bubble Sort	Circular Bubble Sort	Simple Bubble Sort	Linear Bubble Sort	This is an explanation.
146	3	Enumeration Sort uses how much time to sort n elements?	$\hat{O}(1)$	$\hat{O}(n\log n)$	$\hat{O}(n^2)$	$\hat{O}(n)$	This is an explanation.
147	3	The _____ algorithm relies on the binary representation of the elements to be sorted.	Radix-sort	Bubble Sort	Quick-Sort	Bucket-Sort	The radix sort algorithm relies on the binary representation of the elements to be sorted.
148	3	Parallel runtime for Mesh architecture in a bitonic sort is:	$\hat{O}(n/\log n)$	$\hat{O}(n)$	$\hat{O}(n^2)$	$\hat{O}(n^3)$	This is an explanation.
149	1	The number of threads in a thread block is limited by the architecture to a total of how many threads per block?	512	502	510	412	The number of threads in a thread block is also limited by the architecture to a total of 512 threads per block
150	1	CUDA Architecture is mainly provided by which company?	NVIDIA	Intel	Apple	IBM	NVIDIA provides CUDA services.
151	1	In CUDA Architecture, what are subprograms called?	Kernel	Grid	Element	Blocks	Subprograms are called kernels.
152	1	What is the fullform of CUDA?	Compute Unified Device Architecture	Computer Unified Device Architecture	Common USB Device Architecture	Common Unified Disk Architecture	CUDA Stands for Compute Unified Device Architecture.
153	2	Which of these is not an application of CUDA Arhitecture?	Thermo Dynamics	Neural Networks	VLSI Stimulation	Fluid Dynamics	CUDA architecture has no use on Thermo Dynamics.
154	2	CUDA programming is especially well-suited to address problems that can be expressed as _____ computations.	Data parallel	Task Parallel	Both a and b	None	CUDA programming is especially well-suited to address problems that can be expressed as dataparallel computations.
155	2	CUDA C/C++ uses which keyword in programming:	global	kernel	Cuda_void	nvcc	This is an explanation.
156	2	CUDA programs are saved with _____ extension.	.cd	.cx	.cc	.cu	This is an explanation

	marks	question	A	B	C	D	ans
157	2	The Kepler K20-X chip block, contains _____ streaming multiprocessors\n(SMs).	15	8	16	7	The Kepler K20X chip block diagram, containing 15 streaming multiprocessors (SMs)
158	2	The Kepler K20X architecture increases the register file size to:	64K	32K	128K	256K	The K20X architecture increases the register file size to 64K
159	2	The register file in a GPU is of what size?	2 MB	1 MB	3MB	1024B	Register size in a GPU is 2MB.
160	2	NVIDIAâ€™s GPU computing platform is not enabled on which of the following product families:	AMD	Tegra	Quadro	Tesla	This is an explaination.
161	2	Tesla K-40 has compute capability of:	3.5	3.2	3.4	3.1	This is an explaination.
162	2	The SIMD unit creates, manages, schedules and executes _____ threads simultaneously to create a warp.	32	16	24	8	The SIMD unit creates, manages, schedules and executes 32 threads simultaneously to create a warp
163	2	Which hardware is used by the host interface to fasten the transfer of bulk data to and fro the graphics pipeline?	Direct Memory Access	Switch	Hub	Memory Hardware	This is an Explaination
164	2	A _____ is a collection of thread blocks of the same thread dimensionality which all execute the same kernel.	Grid	Core	Element	Blcoks	A â€˜gridâ€™ is a collection of thread blocks of the same thread dimensionality which all execute the same kernel
165	2	Active Warps can be classified into how many types?	3	2	4	5	This is an explaination.
166	2	All threads in a grid share the same _____ space.	Global memory	Local Memory	Synchronized Memory	All	All threads in a grid\nshare the same global memory space
167	2	CUDA was introduced in which year?	2007	2006	2008	2010	This is an explaination.

	marks	question	A	B	C	D	ans
168	3	Unlike a C function call, all CUDA kernel launches are:	Asynchronous	Synchronous	Both a and b	None	Unlike a C function call, all CUDA kernel launches are asynchronous
169	3	A warp consists of _____ consecutive threads and all threads in a warp are executed in Single Instruction Multiple Thread (SIMT) fashion.	32	16	64	128	A warp consists of 32 consecutive threads and all threads in a warp are executed in Single Instruction Multiple Thread (SIMT) fashion
170	3	There are how many streaming multiprocessors in CUDA architecture?	16	8	12	4	This is an explanation.
171	3	In CUDA programming, if CPU is the host then device will be:	GPU	Compiler	HDD	GPGPU	This is an explanation.
172	3	Both grids and blocks use the _____ type with three unsigned integer fields.	Dim3	Dim2	Dim1	Dim4	Both grids and blocks use the dim3 type with three unsigned integer fields
173	3	Tesla P100 GPU based on the Pascal GPU Architecture has 56 Streaming Multiprocessors (SMs), each capable of supporting up to _____ active threads.	2048	512	1024	256	Tesla P100 GPU based on the Pascal GPU Architecture has 56 Streaming Multiprocessors (SMs), each capable of supporting up to 2048 active threads.
174	3	The maximum size at each level of the thread hierarchy is _____ dependent.	Device	Host	Compiler	Memory	The maximum size at each level of the thread hierarchy is device dependent.
175	3	Intel I7 has the memory bus of width:	19B	180B	152B	102B	This is an explanation.
176	3	The _____ is the heart of the GPU architecture:	Streaming Multiprocessor	Multiprocessor	CUDA	Compiler	The Streaming Multiprocessor (SM) is the heart of the GPU architecture.

	<b>marks</b>	<b>question</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>ans</b>
<b>177</b>	3	A kernel is defined using the _____ declaration specification	global	host	device	void	A kernel is defined using the\n____ declaration specification
<b>178</b>	3	The function printThreadInfo() is not used to print out which of the following information about each thread:	Memory Allocations	Block Index	Matrix Coordinates	Control-Index	Ans-(d)- Memory Allocations.

Which is alternative options for latency hiding?

- A. Increase CPU frequency
- B. Multithreading
- C. Increase Bandwidth
- D. Increase Memory

ANSWER: B

\_\_\_\_\_ Communication model is generally seen in tightly coupled system.

- A. Message Passing
- B. Shared-address space
- C. Client-Server
- D. Distributed Network

ANSWER: B

The principal parameters that determine the communication latency are as follows:

- A. Startup time (ts) Per-hop time (th) Per-word transfer time (tw)
- B. Startup time (ts) Per-word transfer time (tw)
- C. Startup time (ts) Per-hop time (th)
- D. Startup time (ts) Message-Packet-Size(W)

ANSWER: A

The number and size of tasks into which a problem is decomposed determines the \_\_\_\_\_

- A. Granularity
- B. Task
- C. Dependency Graph
- D. Decomposition

ANSWER: A

Average Degree of Concurrency is...

- A. The average number of tasks that can run concurrently over the entire duration of execution of the process.
- B. The average time that can run concurrently over the entire duration of execution of the process.
- C. The average in degree of task dependency graph.
- D. The average out degree of task dependency graph.

ANSWER: A

Which task decomposition technique is suitable for the 15-puzzle problem?

- A. Data decomposition
- B. Exploratory decomposition
- C. Speculative decomposition
- D. Recursive decomposition

ANSWER: B

Which of the following method is used to avoid Interaction Overheads?

- A. Maximizing data locality
- B. Minimizing data locality
- C. Increase memory size
- D. None of the above.

ANSWER: A

Which of the following is not parallel algorithm model

- A. The Data Parallel Model
- B. The work pool model
- C. The task graph model
- D. The Speculative Model

ANSWER: D

Nvidia GPU based on following architecture

- A. MIMD
- B. SIMD
- C. SISD
- D. MISD

ANSWER: B

What is Critical Path?

- A. The length of the longest path in a task dependency graph is called the critical path length.
- B. The length of the smallest path in a task dependency graph is called the critical path length.
- C. Path with loop
- D. None of the mentioned.

ANSWER: A

Which decomposition technique uses divide-and-conquer strategy?

- A. recursive decomposition
- B. Sdata decomposition
- C. exploratory decomposition
- D. speculative decomposition

ANSWER: A

If there are 6 nodes in a ring topology how many message passing cycles will be required to complete broadcast process in one to all?

- A. 1
- B. 6
- C. 3
- D. 4

ANSWER: 3

If there is 4 X 4 Mesh topology network then how many ring operation will perform to complete one to all broadcast?

- A. 4
- B. 8
- C. 16
- D. 32

ANSWER: 8

Consider all to all broadcast in ring topology with 8 nodes. How many messages will be present with each node after 3rd step/cycle of communication?

- A. 3
- B. 4
- C. 6
- D. 7

ANSWER: 4

Consider Hypercube topology with 8 nodes then how many message passing cycles will require in all to all broadcast operation?

- A. The longest path between any pair of finish nodes.
- B. The longest directed path between any pair of start & finish node.
- C. The shortest path between any pair of finish nodes.
- D. The number of maximum nodes level in graph.

ANSWER: D

Scatter is \_\_\_\_\_.

- A. One to all broadcast communication
- B. All to all broadcast communication
- C. One to all personalised communication
- D. Node of the above.

ANSWER: C

If there is 4X4 Mesh Topology \_\_\_\_\_ message passing cycles will require complete all to all reduction.

- A. 4
- B. 6
- C. 8
- D. 16

ANSWER: C

Following issue(s) is/are the true about sorting techniques with parallel computing.

- A. Large sequence is the issue
- B. Where to store output sequence is the issue
- C. Small sequence is the issue
- D. None of the above

ANSWER: B

Partitioning on series done after \_\_\_\_\_

- A. Local arrangement
- B. Processess assignments
- C. Global arrangement
- D. None of the above

ANSWER: C

In Parallel DFS processes has following roles. (Select multiple choices if applicable)

- A. Donor
- B. Active
- C. Idle
- D. Passive

ANSWER: A

Suppose there are 16 elements in a series then how many phases will be required to sort the series using parallel odd-even bubble sort?

- A. 8
- B. 4
- C. 5
- D. 15

ANSWER: D

Which are different sources of Overheads in Parallel Programs?

- A. Interprocess interactions
- B. Process Idling
- C. All mentioned options
- D. Excess Computation

ANSWER: C

The ratio of the time taken to solve a problem on a parallel processors to the time required to solve the same problem on a single processor with p identical processing elements.

- A. The ratio of the time taken to solve a problem on a single processor to the time required to solve the same problem on a parallel computer with p identical processing elements.

- B. The ratio of the time taken to solve a problem on a single processor to the time required to solve the same problem on a parallel computer with  $p$  identical processing elements
- C. The ratio of number of multiple processors to size of data
- D. None of the above

ANSWER: B

Efficiency is a measure of the fraction of time for which a processing element is usefully employed.

- A. TRUE
- B. FALSE

ANSWER: A

CUDA helps do execute code in parallel mode using \_\_\_\_\_

- A. CPU
- B. GPU
- C. ROM
- D. Cash memory

ANSWER: B

In thread-function execution scenario thread is a \_\_\_\_\_

- A. Work
- B. Worker
- C. Task
- D. None of the above

ANSWER: B

In GPU Following statements are true

- A. Grid contains Block
- B. Block contains Threads
- C. All the mentioned options.
- D. SM stands for Streaming MultiProcessor

ANSWER: C

Computer system of a parallel computer is capable of \_\_\_\_\_

- A. Decentralized computing
- B. Parallel computing
- C. Centralized computing
- D. All of these

ANSWER: A

In which application system Distributed systems can run well?

- A. HPC
- B. Distrubuted Framework
- C. HRC
- D. None of the above

ANSWER: A

A pipeline is like ..... ?

- A. an automobile assembly line
- B. house pipeline
- C. both a and b
- D. a gas line

ANSWER: A

Pipeline implements ?

- A. fetch instruction
- B. decode instruction
- C. fetch operand
- D. all of above

ANSWER: D

A processor performing fetch or decoding of different instruction during the execution of another instruction is called \_\_\_\_\_ ?

- A. Super-scaling
- B. Pipe-lining
- C. Parallel Computation
- D. None of these

ANSWER: B

In a parallel execution, the performance will always improve as the number of processors will increase?

- A. True
- B. False

ANSWER: B

VLIW stands for ?

- A. Very Long Instruction Word
- B. Very Long Instruction Width
- C. Very Large Instruction Word
- D. Very Long Instruction Width

ANSWER: A

In VLIW the decision for the order of execution of the instructions depends on the program itself?

- A. True
- B. False

ANSWER: A

Which one is not a limitation of a distributed memory parallel system?

- A. Higher communication time
- B. Cache coherency
- C. Synchronization overheads
- D. None of the above

ANSWER: B

Which of these steps can create conflict among the processors?

- A. Synchronized computation of local variables
- B. Concurrent write
- C. Concurrent read
- D. None of the above

ANSWER: B

Which one is not a characteristic of NUMA multiprocessors?

- A. It allows shared memory computing
- B. Memory units are placed in physically different location
- C. All memory units are mapped to one common virtual global memory
- D. Processors access their independent local memories

ANSWER: D

Which of these is not a source of overhead in parallel computing?

- A. Non-uniform load distribution
- B. Less local memory requirement in distributed computing
- C. Synchronization among threads in shared memory computing
- D. None of the above

ANSWER: B

Systems that do not have parallel processing capabilities are?

- A. SISD
- B. SIMD

- C. MIMD
  - D. All of the above
- ANSWER: A

How does the number of transistors per chip increase according to Moore's law?

- A. Quadratically
  - B. Linearly
  - C. Cubically
  - D. Exponentially
- ANSWER: D

Parallel processing may occur?

- A. in the instruction stream
  - B. in the data stream
  - C. both [A] and [B]
  - D. none of the above
- ANSWER: C

To which class of systems does the von Neumann computer belong?

- A. SIMD (Single Instruction Multiple Data)
  - B. MIMD (Multiple Instruction Multiple Data)
  - C. MISD (Multiple Instruction Single Data)
  - D. SISD (Single Instruction Single Data)
- ANSWER: D

Fine-grain threading is considered as a \_\_\_\_\_ threading?

- A. Instruction-level
  - B. Loop level
  - C. Task-level
  - D. Function-level
- ANSWER: A

Multiprocessor is systems with multiple CPUs, which are capable of independently executing different tasks in parallel. In this category every processor and memory module has similar access time?

- A. UMA
  - B. Microprocessor
  - C. Multiprocessor
  - D. NUMA
- ANSWER: A

For inter processor communication the miss arises are called?

- A. hit rate
  - B. coherence misses
  - C. comitt misses
  - D. parallel processing
- ANSWER: B

NUMA architecture uses \_\_\_\_\_ in design?

- A. cache
  - B. shared memory
  - C. message passing
  - D. distributed memory
- ANSWER: D

A multiprocessor machine which is capable of executing multiple instructions on multiple data sets?

- A. SISD
- B. SIMD

- C. MIMD
  - D. MISD
- ANSWER: C

In message passing, send and receive message between?

- A. Task or processes
- B. Task and Execution
- C. Processor and Instruction
- D. Instruction and decode

ANSWER: A

The First step in developing a parallel algorithm is \_\_\_\_\_?

- A. To Decompose the problem into tasks that can be executed concurrently
- B. Execute directly
- C. Execute indirectly
- D. None of Above

ANSWER: A

The number of tasks into which a problem is decomposed determines its?

- A. Granularity
- B. Priority
- C. Modernity
- D. None of above

ANSWER: A

The length of the longest path in a task dependency graph is called?

- A. the critical path length
- B. the critical data length
- C. the critical bit length
- D. None of above

ANSWER: A

The graph of tasks (nodes) and their interactions/data exchange (edges)?

- A. Is referred to as a task interaction graph
- B. Is referred to as a task Communication graph
- C. Is referred to as a task interface graph
- D. None of Above

ANSWER: A

Mappings are determined by?

- A. task dependency
- B. task interaction graphs
- C. Both A and B
- D. None of Above

ANSWER: C

Decomposition Techniques are?

- A. recursive decomposition
- B. data decomposition
- C. exploratory decomposition
- D. All of Above

ANSWER: D

The Owner Computes Rule generally states that the process assigned a particular data item is responsible for?

- A. All computation associated with it
- B. Only one computation
- C. Only two computation
- D. Only occasionally computation

ANSWER: A

A simple application of exploratory decomposition is\_?

- A. The solution to a 15 puzzle
- B. The solution to 20 puzzle
- C. The solution to any puzzle
- D. None of Above

ANSWER: A

Speculative Decomposition consist of \_?

- A. conservative approaches
- B. optimistic approaches
- C. Both A and B
- D. Only B

ANSWER: C

task characteristics include?

- A. Task generation.
- B. Task sizes.
- C. Size of data associated with tasks.
- D. All of Above

ANSWER: D

Writing parallel programs is referred to as?

- A. Parallel computation
- B. Parallel processes
- C. Parallel development
- D. Parallel programming

ANSWER: D

Parallel Algorithm Models?

- A. Data parallel model
- B. Bit model
- C. Data model
- D. network model

ANSWER: A

The number and size of tasks into which a problem is decomposed determines the?

- A. fine-granularity
- B. coarse-granularity
- C. sub Task
- D. granularity

ANSWER: A

A feature of a task-dependency graph that determines the average degree of concurrency for a given granularity is its \_\_\_\_\_ path?

- A. critical
- B. easy
- C. difficult
- D. ambiguous

ANSWER: A

The pattern of \_\_\_\_\_ among tasks is captured by what is known as a task-interaction graph?

- A. Interaction
- B. communication
- C. optmization
- D. flow

ANSWER: A

Interaction overheads can be minimized by \_\_\_\_\_?

- A. Maximize Data Locality
- B. Maximize Volume of data exchange
- C. Increase Bandwidth
- D. Minimize social media contents

ANSWER: A

Type of parallelism that is naturally expressed by independent tasks in a task-dependency graph is called \_\_\_\_\_ parallelism?

- A. Task
- B. Instruction
- C. Data
- D. Program

ANSWER: A

Speed up is defined as a ratio of?

- A.  $s = T_s / T_p$
- B.  $S = T_p / T_s$
- C.  $T_s = S / T_p$
- D.  $T_p = S / T_s$

ANSWER: A

Parallel computing means to divide the job into several \_\_\_\_\_?

- A. Bit
- B. Data
- C. Instruction
- D. Task

ANSWER: D

\_\_\_\_\_ is a method for inducing concurrency in problems that can be solved using the divide-and-conquer strategy?

- A. exploratory decomposition
- B. speculative decomposition
- C. data-decomposition
- D. Recursive decomposition

ANSWER: C

The \_\_\_\_\_ time collectively spent by all the processing elements  $T_{all} = p \cdot T_P$ ?

- A. total
- B. Average
- C. mean
- D. sum

ANSWER: A

Group communication operations are built using point-to-point messaging primitives?

- A. True
- B. False

ANSWER: A

Communicating a message of size  $m$  over an uncongested network takes time  $t_s + t_{mw}$ ?

- A. True
- B. False

ANSWER: A

The dual of one-to-all broadcast is ?

- A. All-to-one reduction
- B. All-to-one receiver

C. All-to-one Sum

D. None of Above

ANSWER: A

A hypercube has?

A. 2d nodes

B. 2d nodes

C. 2n Nodes

D. N Nodes

ANSWER: A

A binary tree in which processors are (logically) at the leaves and internal nodes are routing nodes?

A. True

B. False

ANSWER: A

In All-to-All Broadcast each processor is the source as well as destination?

A. True

B. False

ANSWER: A

The Prefix Sum Operation can be implemented using the ?

A. All-to-all broadcast kernel.

B. All-to-one broadcast kernel.

C. One-to-all broadcast Kernel

D. Scatter Kernel

ANSWER: A

In the scatter operation ?

A. Single node send a unique message of size m to every other node

B. Single node send a same message of size m to every other node

C. Single node send a unique message of size m to next node

D. None of Above

ANSWER: A

The gather operation is exactly the inverse of the ?

A. Scatter operation

B. Broadcast operation

C. Prefix Sum

D. Reduction operation

ANSWER: A

In All-to-All Personalized Communication Each node has a distinct message of size m for every other node ?

A. True

B. False

ANSWER: A

Parallel algorithms often require a single process to send identical data to all other processes or to a subset of them. This operation is known as

?

A. one-to-all broadcast

B. All to one broadcast

C. one-to-all reduction

D. all to one reduction

ANSWER: A

In which of the following operation, a single node sends a unique message of size m to every other node?

- A. Gather
- B. Scatter
- C. One to all personalized communication
- D. Both A and C

ANSWER: D

Gather operation is also known as \_\_\_\_\_?

- A. One to all personalized communication
- B. One to all broadcast
- C. All to one reduction
- D. All to All broadcast

ANSWER: A

one-to-all personalized communication does not involve any duplication of data?

- A. True

- B. False

ANSWER: A

Gather operation, or concatenation, in which a single node collects a unique message from each node?

- A. True

- B. False

ANSWER: A

Conventional architectures coarsely comprise of a?

- A. A processor
- B. Memory system
- C. Data path.
- D. All of Above

ANSWER: D

Data intensive applications utilize?

- A. High aggregate throughput
- B. High aggregate network bandwidth
- C. High processing and memory system performance.
- D. None of above

ANSWER: A

A pipeline is like?

- A. Overlaps various stages of instruction execution to achieve performance.
- B. House pipeline
- C. Both a and b
- D. A gas line

ANSWER: A

Scheduling of instructions is determined?

- A. True Data Dependency
- B. Resource Dependency
- C. Branch Dependency
- D. All of above

ANSWER: D

VLIW processors rely on?

- A. Compile time analysis
- B. Initial time analysis
- C. Final time analysis

D. Mid time analysis

ANSWER: A

Memory system performance is largely captured by?

- A. Latency
- B. Bandwidth
- C. Both a and b
- D. none of above

ANSWER: C

The fraction of data references satisfied by the cache is called?

- A. Cache hit ratio
- B. Cache fit ratio
- C. Cache best ratio
- D. none of above

ANSWER: A

A single control unit that dispatches the same Instruction to various processors is?

- A. SIMD
- B. SPMD
- C. MIMD
- D. None of above

ANSWER: A

The primary forms of data exchange between parallel tasks are?

- A. Accessing a shared data space
- B. Exchanging messages.
- C. Both A and B
- D. None of Above

ANSWER: C

Switches map a fixed number of inputs to outputs?

- A. True
- B. False

ANSWER: A

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- D. Only B

ANSWER: C

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- B. Task sizes.
- C. Size of data associated with tasks.
- D. All of Above.

ANSWER: D

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- B. False

ANSWER: A

Computer system of a parallel computer is capable of?

- A. Decentralized computing
- B. Parallel computing
- C. Centralized computing
- D. Decentralized computing
- E. Distributed computing

ANSWER: A

Writing parallel programs is referred to as?

- A. Parallel computation
- B. Parallel processes
- C. Parallel development
- D. Parallel programming

ANSWER: D

Simplifies applications of three-tier architecture is \_\_\_\_\_?

- A. Maintenance
- B. Initiation
- C. Implementation
- D. Deployment

ANSWER: D

Dynamic networks of networks, is a dynamic connection that grows is called?

- A. Multithreading
- B. Cyber cycle
- C. Internet of things
- D. Cyber-physical system

ANSWER: C

In which application system Distributed systems can run well?

- A. HPC
- B. HTC
- C. HRC
- D. Both A and B

ANSWER: D

In which systems desire HPC and HTC?

- A. Adaptivity
- B. Transparency
- C. Dependency
- D. Secretive

ANSWER: B

No special machines manage the network of architecture in which resources are known as?

- A. Peer-to-Peer
- B. Space based
- C. Tightly coupled
- D. Loosely coupled

ANSWER: A

Significant characteristics of Distributed systems have of ?

- A. 5 types
- B. 2 types
- C. 3 types
- D. 4 types

ANSWER: C

Built of Peer machines are over?

- A. Many Server machines
- B. 1 Server machine
- C. 1 Client machine
- D. Many Client machines

ANSWER: D

Type HTC applications are?

- A. Business
- B. Engineering
- C. Science
- D. Media mass

ANSWER: A

Virtualization that creates one single address space architecture that of, is called?

- A. Loosely coupled
- B. Peer-to-Peer
- C. Space-based
- D. Tightly coupled

ANSWER: C

We have an internet cloud of resources In cloud computing to form?

- A. Centralized computing
- B. Decentralized computing
- C. Parallel computing
- D. All of these

ANSWER: D

Data access and storage are elements of Job throughput, of \_\_\_\_\_?

- A. Flexibility
- B. Adaptation
- C. Efficiency
- D. Dependability

ANSWER: C

Billions of job requests is over massive data sets, ability to support known as?

- A. Efficiency
- B. Dependability
- C. Adaptation
- D. Flexibility

ANSWER: C

Broader concept offers Cloud computing .to select which of the following?

- A. Parallel computing
- B. Centralized computing
- C. Utility computing
- D. Decentralized computing

ANSWER: C

Resources and clients transparency that allows movement within a system is called?

- A. Mobility transparency
- B. Concurrency transparency
- C. Performance transparency
- D. Replication transparency

ANSWER: A

Distributed program in a distributed computer running a is known as?

- A. Distributed process
- B. Distributed program
- C. Distributed application
- D. Distributed computing

ANSWER: B

Uniprocessor computing devices is called\_\_\_\_\_?

- A. Grid computing

- B. Centralized computing
- C. Parallel computing
- D. Distributed computing

ANSWER: B

Utility computing focuses on a \_\_\_\_\_ model?

- A. Data
- B. Cloud
- C. Scalable
- D. Business

ANSWER: D

What is a CPS merges technologies?

- A. 5C
- B. 2C
- C. 3C
- D. 4C

ANSWER: C

Aberration of HPC?

- A. High-peak computing
- B. High-peripheral computing
- C. High-performance computing
- D. Highly-parallel computing

ANSWER: C

Peer-to-Peer leads to the development of technologies like?

- A. Norming grids
- B. Data grids
- C. Computational grids
- D. Both A and B

ANSWER: D

Type of HPC applications of?

- A. Management
- B. Media mass
- C. Business
- D. Science

ANSWER: D

The development generations of Computer technology has gone through?

- A. 6
- B. 3
- C. 4
- D. 5

ANSWER: D

Utilization rate of resources in an execution model is known to be its?

- A. Adaptation
- B. Efficiency
- C. Dependability
- D. Flexibility

ANSWER: B

Even under failure conditions Providing Quality of Service (QoS) assurance is the responsibility of?

- A. Dependability
- B. Adaptation
- C. Flexibility
- D. Efficiency

ANSWER: A

Interprocessor communication that takes place?

- A. Centralized memory
- B. Shared memory
- C. Message passing
- D. Both A and B

ANSWER: D

Data centers and centralized computing covers many and?

- A. Microcomputers
- B. Minicomputers
- C. Mainframe computers
- D. Supercomputers

ANSWER: D

Which of the following is an primary goal of HTC paradigm \_\_\_\_\_?

- A. High ratio Identification
- B. Low-flux computing
- C. High-flux computing
- D. Computer utilities

ANSWER: C

The high-throughput service provided is measures taken by

- A. Flexibility
- B. Efficiency
- C. Dependability
- D. Adaptation

ANSWER: D

What are the sources of overhead?

- A. Essential /Excess Computation
- B. Inter-process Communication
- C. Idling
- D. All above

ANSWER: D

Which are the performance metrics for parallel systems?

- A. Execution Time
- B. Total Parallel Overhead
- C. Speedup
- D. All above

ANSWER: D

The efficiency of a parallel program can be written as:  $E = Ts / pTp$ .

True or False?

- A. True

- B. False

ANSWER: A

The important feature of the VLIW is \_\_\_\_\_?

- A. ILP
- B. Performance
- C. Cost effectiveness
- D. delay

ANSWER: A

What are the sources of overhead?

- A. Essential /Excess Computation
- B. Inter-process Communication
- C. Idling
- D. All above

**Answer : D**

Which are the performance metrics for parallel systems?

- A. Execution Time
- B. Total Parallel Overhead
- C. Speedup
- D. Efficiency
- E. Cost
- F. All above

**Answer : F**

The efficiency of a parallel program can be written as:  $E = Ts / pTp$ . True or False?

- A. True
- B. False

**Answer : A**

Overhead function or **total overhead** of a parallel system as the total time collectively spent by all the processing elements over and above that required by the fastest known sequential algorithm for solving the same problem on a single processing element. True or False?

- A. True
- B. False

**Answer : A**

What is Speedup?

- A. A measure that captures the relative benefit of solving a problem in parallel. It is defined as the ratio of the time taken to solve a problem on a single processing element to the time required to solve the same problem on a parallel computer with  $p$  identical processing elements.
- B. A measure of the fraction of time for which a processing element is usefully employed.
- C. None of the above

**Answer : A**

In an ideal parallel system, speedup is equal to  $p$  and efficiency is equal to one. True or False?

- A. True
- B. False

**Answer : A**

A parallel system is said to be \_\_\_\_\_ if the cost of solving a problem on a parallel computer has the same asymptotic growth (in  $\Theta$  terms) as a function of the input size as the fastest-known sequential algorithm on a single processing element.

- A. Cost optimal
- B. Non Cost optimal

**Answer : A**

Using fewer than the maximum possible number of processing elements to execute a parallel algorithm is called \_\_\_\_\_ a parallel system in terms of the number of processing elements.

- A. Scaling down
- B. Scaling up

**Answer : B**

The \_\_\_\_\_ function determines the ease with which a parallel system can maintain a constant efficiency and hence achieve speedups increasing in proportion to the number of processing elements.

- A. Isoefficiency
- B. Efficiency
- C. Scalability
- D. Total overhead

**Answer : A**

Minimum execution time for adding n numbers is  $T_p = n/p + 2 \log p$  True or False ?

- A. True
- B. False

**Answer : A**

The overhead function  $T_o = pTP - TS$ .

- A. True
- B. False

**Answer : A**

Performance Metrics for Parallel Systems: Speedup(S) = $TS/TP$

- A. True
- B. False

**Answer : A**

Matrix Vector multiplication 2D Partitions requires some basic communication operations

- A. one-to-one communication to align the vector along the main diagonal
- B. one-to-all broadcast of each vector element among the n processes of each column
- C. all-to-one reduction in each row
- D. All Above

**Answer : D**



What are the issues in sorting?

- A. Where the Input and Output Sequences are Stored
- B. How Comparisons are Performed
- C. All above

**Answer : C**

The parallel run time of the formulation for Bubble sort is

- A.  $T_p = O(n/p \log n/p) + O(n) + O(n)$
- B.  $T_p = O(n/p \log n/p) + O(n/p \log p) + O(\ln n/p)$
- C. Non of the above

**Answer : A**

What are the variants of Bubble sort?

- A. Shell sort
- B. Quick sort
- C. Odd-Even transposition
- D. Option A & C

**Answer : D**

What is the overall complexity of parallel algorithm for quick sort?

- A.  $T_p = O(n/p \log n/p) + O(n/p \log p) + O(\log^2 p)$
- B.  $T_p = O(n/p \log n/p) + O(n/p \log p)$
- C.  $T_p = O(n/p \log n/p) + O(\log^2 p)$

**Answer : A**

Formally, given a weighted graph  $G(V, E, w)$ , the ***all-pairs shortest paths*** problem is to find the shortest paths between all pairs of vertices. True or False?

- A. True
- B. False

**Answer : A**

What is true for parallel formulation of Dijkstra's Algorithm?

- A. One approach partitions the vertices among different processes and has each process compute the single-source shortest paths for all vertices assigned to it. We refer to this approach as the ***source-partitioned formulation***.
- B. Another approach assigns each vertex to a set of processes and uses the parallel formulation of the single-source algorithm to solve the problem on each set of processes. We refer to this approach as the ***source-parallel formulation***.
- C. Both are true
- D. Non of these is true

**Answer : C**

Search algorithms can be used to solve discrete optimization problems. True or False ?

- A. True
- B. False

**Answer : A**

Examples of Discrete optimization problems are ;

- A. planning and scheduling,
- B. The optimal layout of VLSI chips,
- C. Robot motion planning,
- D. Test-pattern generation for digital circuits, and logistics and control.
- E. All of above

**Answer : E**

List the important parameters of Parallel DFS

- A. Work- Splitting Strategies
- B. Load balancing Schemes
- C. All of above

**Answer : C**

List the communication strategies for parallel BFS.

- A. Random communication strategy
- B. Ring communication strategy
- C. Blackboard communication strategy
- D. All of above

**Answer : D**

The lower bound on any comparison-based sort of  $n$  numbers is  $\Theta(n \log n)$

- A. True
- B. False

**Answer : A**

In a compare-split operation

- A. Each process sends its block of size  $n/p$  to the other process
- B. Each process merges the received block with its own block and retains only the appropriate half of the merged block
- C. Both A & B

**Answer : C**

In a typical sorting network

- A. Every sorting network is made up of a series of columns
- B. Each column contains a number of comparators connected in parallel
- C. Both A & B

**Answer : C**

Bubble sort is difficult to parallelize since the algorithm has no concurrency

- A. True
- B. False

**Answer : A**

Which of the following statements are true with regard to compute capability in CUDA

- A. Code compiled for hardware of one compute capability will not need to be re-compiled to run on hardware of another
- B. Different compute capabilities may imply a different amount of local memory per thread
- C. Compute capability is measured by the number of FLOPS a GPU accelerator can compute.

**Answer : B**

True or False: The threads in a thread block are distributed across SM units so that each thread is executed by one SM unit.

- A. True
- B. False

**Answer : B**

The style of parallelism supported on GPUs is best described as

- A. SISD - Single Instruction Single Data
- B. MISD - Multiple Instruction Single Data
- C. SIMD - Single Instruction Multiple Thread

**Answer : C**

True or false: Functions annotated with the `__global__` qualifier may be executed on the host or the device

- A. True
- B. Flase

**Answer : A**

Which of the following correctly describes a GPU kernel

- A. A kernel may contain a mix of host and GPU code
- B. All thread blocks involved in the same computation use the same kernel
- C. A kernel is part of the GPU's internal micro-operating system, allowing it to act as an independent host

**Answer : B**

Which of the following is *not* a form of parallelism supported by CUDA

- A. Vector parallelism - Floating point computations are executed in parallel on wide vector units
- B. Thread level task parallelism - Different threads execute a different tasks
- C. Block and grid level parallelism - Different blocks or grids execute different tasks
- D. Data parallelism - Different threads and blocks process different parts of data in memory

**Answer :A**

What strategy does the GPU employ if the threads within a warp diverge in their execution?

- A. Threads are moved to different warps so that divergence does not occur within a single warp
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**Answer : C**

Which of the following does *not* result in uncoalesced (i.e. serialized) memory access on the K20 GPUs installed on Stampede

- A. Aligned, but non-sequential access
- B. Misaligned data access
- C. Sparse memory access

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Which of the following correctly describes the relationship between Warps, thread blocks, and CUDA cores?

- A. A warp is divided into a number of thread blocks, and each thread block executes on a single CUDA core
- B. A thread block may be divided into a number of warps, and each warp may execute on a single CUDA core
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**Answer : B**

Shared memory in CUDA is accessible to:

- A. All threads in a single block
- B. Both the host and GPU
- C. All threads associated with a single kernel

**Answer : A**

CUDA Architecture CPU consist of

- A. CUDA Libraries
- B. CUDA Runtime
- C. CUDA Driver
- D. All Above

**Answer : D**

CUDA platform works on

- A. C
- B. C++
- C. Fortran
- D. All Above

**Answer : D**

Threads support Shared memory and Synchronization

- A. True
- B. False

**Answer : A**

Application of CUDA are

- A. Fast Video Transcoding
- B. Medical Imaging
- C. Computational Science
- D. Oil and Natural Resources exploration
- E. All Above

**Answer : E**

GPU execute device code

- A. True
- B. False

**Answer : A**

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## SET 1 (120 MCQs)

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1. Conventional architectures coarsely comprise of a\_
  - A. A processor
  - B. Memory system
  - C Data path.

**D All of Above**
2. Data intensive applications utilize\_
  - A **High aggregate throughput**
  - B High aggregate network bandwidth
  - C High processing and memory system performance.
  - D None of above
3. A pipeline is like\_
  - A **Overlaps various stages of instruction execution to achieve performance.**
  - B House pipeline
  - C Both a and b
  - D A gas line
4. Scheduling of instructions is determined\_
  - A True Data Dependency
  - B Resource Dependency
  - C Branch Dependency
  - D All of above**
5. VLIW processors rely on\_
  - A **Compile time analysis**
  - B Initial time analysis
  - C Final time analysis
  - D Mid time analysis
6. Memory system performance is largely captured by\_
  - A Latency
  - B Bandwidth
  - C Both a and b**
  - D none of above
7. The fraction of data references satisfied by the cache is called\_

- A Cache hit ratio**  
B Cache fit ratio  
B Cache best ratio  
C none of above
8. A single control unit that dispatches the same Instruction to various processors is\_\_
- A SIMD**  
B SPMD  
C MIMD  
D None of above
9. The primary forms of data exchange between parallel tasks are\_\_
- A Accessing a shared data space  
B Exchanging messages.  
**C Both A and B**  
D None of Above
10. Switches map a fixed number of inputs to outputs.
- A True**  
B False
11. The First step in developing a parallel algorithm is\_\_
- A. To Decompose the problem into tasks that can be executed concurrently**  
B. Execute directly  
C. Execute indirectly  
D. None of Above
12. The number of tasks into which a problem is decomposed determines its\_\_
- A. Granularity**  
B. Priority  
C. Modernity  
D. None of above
13. The length of the longest path in a task dependency graph is called\_\_
- A. the critical path length**  
B. the critical data length  
C. the critical bit length  
D. None of above  
E.
14. The graph of tasks (nodes) and their interactions/data exchange (edges)\_
- A. Is referred to as a *task interaction graph***

- B. Is referred to as a *task Communication graph*
- C. Is referred to as a *task interface graph*
- D. None of Above

15. Mappings are determined by\_

- A. task dependency
- B. task interaction graphs
- C. Both A and B**
- D. None of Above

16. Decomposition Techniques are\_

- A. recursive decomposition
- B. data decomposition
- C. exploratory decomposition
- D. speculative decomposition
- E. All of Above**

17. The *Owner Computes Rule* generally states that the process assigned a particular data item is responsible for\_

- A. All computation associated with it**
- B. Only one computation
- C. Only two computation
- D. Only occasionally computation

18. A simple application of exploratory decomposition is\_

- A. The solution to a 15 puzzle**
- B. The solution to 20 puzzle
- C. The solution to any puzzle
- D. None of Above

19. Speculative Decomposition consist of \_

- A. conservative approaches
- B. optimistic approaches
- C. Both A and B**
- D. Only B

20. task characteristics include:

- A. Task generation.
- B. Task sizes.
- C. Size of data associated with tasks.
- D. All of Above**

21. Group communication operations are built using point-to-point messaging primitives
- A. **True**
  - B. False
22. Communicating a message of size  $m$  over an uncongested network takes time  $ts + tmw$
- A. **True**
  - B. False
23. The dual of one-to-all broadcast is\_
- A. **All-to-one reduction**
  - B. All-to-one receiver
  - C. All-to-one Sum
  - D. None of Above
24. A hypercube has\_
- A.  **$2^d$  nodes**
  - B.  $2d$  nodes
  - C.  $2n$  Nodes
  - D. N Nodes
25. A binary tree in which processors are (logically) at the leaves and internal nodes are routing nodes.
- A. **True**
  - B. False
26. In All-to-All Broadcast each processor is the source as well as destination.
- A. **True**
  - B. False
27. The Prefix Sum Operation can be implemented using the\_
- A. **All-to-all broadcast kernel.**
  - B. All-to-one broadcast kernel.
  - C. One-to-all broadcast Kernel
  - D. Scatter Kernel
28. In the *scatter* operation\_
- A. **Single node send a unique message of size  $m$  to every other node**
  - B. Single node send a same message of size  $m$  to every other node
  - C. Single node send a unique message of size  $m$  to next node

D. None of Above

29. The gather operation is exactly the inverse of the \_

- A. Scatter operation
- B. Broadcast operation
- C. Prefix Sum
- D. Reduction operation

30. In All-to-All Personalized Communication Each node has a distinct message of size m for every other node

- A. True
- B. False

31. Computer system of a parallel computer is capable of

- A. Decentralized computing
- B. Parallel computing
- C. Centralized computing
- D. Decentralized computing
- E. Distributed computing
- F. All of these
- G. None of these

32. Writing parallel programs is referred to as

- A. Parallel computation
- B. Parallel processes
- C. Parallel development
- D. Parallel programming
- E. Parallel computation
- F. All of these
- G. None of these

33. Simplifies applications of three-tier architecture is \_\_\_\_\_.

- A. Maintenance
- B. Initiation
- C. Implementation
- D. Deployment
- E. All of these
- F. None of these

34. Dynamic networks of networks, is a dynamic connection that grows is called

- A. Multithreading
- B. Cyber cycle
- C. Internet of things**
- D. Cyber-physical system
- E. All of these
- F. None of these

35. In which application system Distributed systems can run well?

- A. HPC
- D. HTC
- C. HRC
- D. Both A and B**
- E. All of these
- F. None of these

36. In which systems desire HPC and HTC.

- A. Adaptivity
- B. Transparency**
- C. Dependency
- D. Secretive
- E. Adaptivity
- F. All of these
- G. None of these

37. No special machines manage the network of architecture in which resources are known as

- A. Peer-to-Peer**
- B. Space based
- C. Tightly coupled
- D. Loosely coupled
- E. All of these
- F. None of these

38. Significant characteristics of Distributed systems have of

- A. 5 types
- B. 2 types
- C. 3 types**
- D. 4 types
- E. All of these
- F. None of these

39. Built of Peer machines are over

- A. Many Server machines
- B. 1 Server machine
- C. 1 Client machine
- D. Many Client machines**
- E. All of these
- F. None of these

40. Type HTC applications are

- A. Business**
- B. Engineering
- C. Science
- D. Media mass
- E. All of these
- F. None of these

41. Virtualization that creates one single address space architecture that of, is called

- A. Loosely coupled
- B. Peer-to-Peer
- C. Space-based**
- D. Tightly coupled
- E. Loosely coupled
- F. All of these
- G. None of these

42. We have an internet cloud of resources In cloud computing to form

- A. Centralized computing
- B. Decentralized computing
- C. Parallel computing
- D. Both A and B
- E. All of these**
- F. None of these

43. Data access and storage are elements of Job throughput, of \_\_\_\_\_.

- A. Flexibility
- B. Adaptation
- C. Efficiency**
- D. Dependability
- E. All of these
- F. None of these

44. Billions of job requests is over massive data sets, ability to support known as

- A. Efficiency
- B. Dependability
- C. Adaptation**
- D. Flexibility
- E. All of these
- F. None of these

45. Broader concept offers Cloud computing .to select which of the following.

- A. Parallel computing
- B. Centralized computing
- C. Utility computing**
- D. Decentralized computing
- E. Parallel computing
- F. All of these
- G. None of these

46. Resources and clients transparency that allows movement within a system is called

- A. Mobility transparency**
- B. Concurrency transparency
- C. Performance transparency
- D. Replication transparency
- E. All of these
- F. None of these

47. Distributed program in a distributed computer running a is known as

- A. Distributed process
- B. Distributed program**
- C. Distributed application
- D. Distributed computing
- E. All of these
- F. None of these

48. Uniprocessor computing devices is called\_\_\_\_\_.

- A. Grid computing
- B. Centralized computing**
- C. Parallel computing
- D. Distributed computing
- E. All of these
- F. None of these

49. Utility computing focuses on a\_\_\_\_\_ model.

- A. Data
- B. Cloud
- C. Scalable
- D. Business**
- E. All of these
- F. None of these

50.|What is a CPS merges technologies

- A. 5C
- B. 2C
- C. 3C**
- D. 4C
- E. All of these
- F. None of these

51. Aberration of HPC

- A. High-peak computing
- B. High-peripheral computing
- C. High-performance computing**
- D. Highly-parallel computing
- E. All of these
- F. None of these

52. Peer-to-Peer leads to the development of technologies like

- A. Norming grids
- B. Data grids
- C. Computational grids
- D. Both A and B**
- E. All of these
- F. None of these

53. Type of HPC applications of.

- A. Management
- B. Media mass
- C. Business
- D. Science**
- E. All of these
- F. None of these

54. The development generations of Computer technology has gone through

- A. 6

B. 3

C. 4

**D. 5**

E. All of these

F. None of these

55. Utilization rate of resources in an execution model is known to be its

A. Adaptation

**B. Efficiency**

C. Dependability

D. Flexibility

E. All of these

F. None of these

56. Even under failure conditions Providing Quality of Service (QoS) assurance is the responsibility of

**A. Dependability**

B. Adaptation

C. Flexibility

D. Efficiency

E. All of these

F. None of these

57. Interprocessor communication that takes place

A. Centralized memory

B. Shared memory

C. Message passing

**D. Both A and B**

E. All of these

F. None of these

58. Data centers and centralized computing covers many and

A. Microcomputers

B. Minicomputers

C. Mainframe computers

**D. Supercomputers**

E. All of these

F. None of these

59. Which of the following is an primary goal of HTC paradigm\_\_\_\_\_.

A. High ratio Identification

B. Low-flux computing

**C. High-flux computing**

D. Computer utilities

- E. All of these
  - F. None of these
60. The high-throughput service provided is measures taken by
- A. Flexibility
  - B. Efficiency
  - D. Adaptation**
  - E. Dependability
  - F. All of these
  - G. None of these
61. What are the sources of overhead?
- A. Essential /Excess Computation
  - B. Inter-process Communication
  - C. Idling
  - D. All above**
62. Which are the performance metrics for parallel systems?
- A. Execution Time
  - B. Total Parallel Overhead
  - C. Speedup
  - D. Efficiency
  - E. Cost
  - F. All above**
63. The efficiency of a parallel program can be written as:  $E = Ts / pTp$ . True or False?
- A. True**
  - B. False
64. Overhead function or **total overhead** of a parallel system as the total time collectively spent by all the processing elements over and above that required by the fastest known sequential algorithm for solving the same problem on a single processing element.      True or False?
- A. True**
  - B. False
65. What is Speedup?
- A. A measure that captures the relative benefit of solving a problem in parallel. It is defined as the ratio of the time taken to solve a problem on a single processing element to the time required to solve the same problem on a parallel computer with  $p$  identical processing elements.
  - B. A measure of the fraction of time for which a processing element is usefully employed.
  - C. None of the above

**Answer : A**

66. In an ideal parallel system, speedup is equal to  $p$  and efficiency is equal to one. True or False?

- A. True
- B. False

67. A parallel system is said to be \_\_\_\_\_ if the cost of solving a problem on a parallel computer has the same asymptotic growth (in  $Q$  terms) as a function of the input size as the fastest-known sequential algorithm on a single processing element.

- A. Cost optimal
- B. Non Cost optimal

68. Using fewer than the maximum possible number of processing elements to execute a parallel algorithm is called \_\_\_\_\_ a parallel system in terms of the number of processing elements.

- A. Scaling down
- B. Scaling up

69. The \_\_\_\_\_ function determines the ease with which a parallel system can maintain a constant efficiency and hence achieve speedups increasing in proportion to the number of processing elements.

- A. Isoefficiency
- B. Efficiency
- C. Scalability
- D. Total overhead

70. Minimum execution time for adding  $n$  numbers is  $T_p = n/p + 2 \log p$  True or False ?

- A. True
- B. False

71. The overhead function  $To = pTP - TS$ .

- A. True
- B. False

72. Performance Metrics for Parallel Systems: Speedup(S) = $TS/TP$

- A. True
- B. False

73. Matrix Vector multiplication 2D Partitions requires some basic communication operations

- A. one-to-one communication to align the vector along the main diagonal
- B. one-to-all broadcast of each vector element among the  $n$  processes of each column
- C. all-to-one reduction in each row
- D. All Above

74. What are the issues in sorting?

- A. Where the Input and Output Sequences are Stored
- B. How Comparisons are Performed
- C. All above

**Answer : C**

75. The parallel run time of the formulation for Bubble sort is

- A.  $T_p = O(n/p \log n/p) + O(n) + O(n)$**
- B.  $T_p = O(n/p \log n/p) + O(n/p \log p) + O(\ln p)$
- C. Non of the above

76. What are the variants of Bubble sort?

- A. Shell sort
- B. Quick sort
- C. Odd-Even transposition
- D. Option A & C**

77. What is the overall complexity of parallel algorithm for quick sort?

- A.  $T_p = O(n/p \log n/p) + O(n/p \log p) + O(\log^2 p)$**
- B.  $T_p = O(n/p \log n/p) + O(n/p \log p)$
- C.  $T_p = O(n/p \log n/p) + O(\log^2 p)$

78. Formally, given a weighted graph  $G(V, E, w)$ , the ***all-pairs shortest paths*** problem is to find the shortest paths between all pairs of vertices. True or False?

- A. True**
- B. False

79. What is true for parallel formulation of Dijkstra's Algorithm?

- A. One approach partitions the vertices among different processes and has each process compute the single-source shortest paths for all vertices assigned to it. We refer to this approach as the ***source-partitioned formulation***.
- B. Another approach assigns each vertex to a set of processes and uses the parallel formulation of the single-source algorithm to solve the problem on each set of processes. We refer to this approach as the ***source-parallel formulation***.
- C. Both are true**
- D. Non of these is true

80. Search algorithms can be used to solve discrete optimization problems. True or False ?

- A. True**
- B. False

81. Examples of Discrete optimization problems are ;
- A. planning and scheduling,
  - B. The optimal layout of VLSI chips,
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  - D. Test-pattern generation for digital circuits, and logistics and control.
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  - C. A thread block is assigned to a warp, and each thread in the warp is executed on a separate CUDA core
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  - B. Both the host and GPU
  - C. All threads associated with a single kernel
94. CUDA Architecture CPU consist of
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  - B. CUDA Runtime
  - C. CUDA Driver
  - D. **All Above**
95. CUDA platform works on
- A. C
  - B. C++
  - C. Forton
  - D. **All Above**
96. Threads support Shared memory and Synchronization
- A. **True**
  - B. False
97. Application of CUDA is
- A. Fast Video Transcoding
  - B. Medical Imaging
  - C. Computational Science
  - D. Oil and Natural Resources exploration
  - E. **All Above**
98. GPU execute device code
- A. **True**
  - B. False
99. Hazard are eliminated through renaming by renaming all
- A. Source register
  - B. Memory
  - C. Data
  - D. **Destination register**

100. Types of HPC application

- A. Mass Media
- B. Business
- C. Management
- D. Science**

101. A distributed operating system must provide a mechanism for

- A. intraprocessor communication**
- B. intraprocess and intraprocessor communication
- C. interprocess and interprocessor communication
- D. interprocessor communication

102. This is computation not performed by the serial version

- A. Serial computation**
- B. Excess computation
- C. perpendicular computation
- D. parallel computing

103. The important feature of the VLIW is \_\_\_\_\_

- A. ILP**
- B. Performance
- C. Cost effectiveness
- D. delay

104. The tightly coupled set of threads execution working on a single task ,that is called

- A. Multithreading**
- B. Parallel processing
- C. Recurrence
- D. Serial processing

105. Parallel Algorithm Models

- A. Data parallel model**

- B. Bit model
- C. Data model
- D. Network model

106. `Mpi_Recv` used for

- A. reverse message
- B. receive message**
- C. forward message
- D. Collect message

107. Status bit is also called

- A. Binary bit**
- B. Flag bit
- C. Signed bit
- D. Unsigned bit

108. For inter processor communication the miss arises are called

- A. hit rate
- B. coherence misses**
- C. comitt misses
- D. parallel processing

109. The interconnection topologies are implemented using \_\_\_\_\_ as a node.

- A. control unit
- B. microprocessor**
- C. processing unit
- D. microprocessor or processing unit

110. \_\_\_\_\_ gives the theoretical speedup in latency of the execution of a task at fixed execution time

- A. Amdahl's

- B. Moor's
- C. metcalfe's
- D. Gustafson's law**

111. The number and size of tasks into which a problem is decomposed determines the

- A. fine-grainularity
- B. coarse-grainularity
- C. sub Task
- D. granularity**

112. MPI\_Finalize used for

- A. Stop mpi environment program**
- B. intialise program
- C. Include header files
- D. program start

113. Private data that is used by a single processor then shared data are used

- A. Single processor**
- B. Multi processor
- C. Single tasking
- D. Multi tasking

114. The time lost due to the branch instruction is often referred to as \_\_\_\_\_

- A. Delay
- B. Branch penalty**
- C. Latency
- D. control hazard

115. NUMA architecture uses \_\_\_\_\_ in design

- A. cache
- B. shared memory**

- C. message passing
- D. distributed memory**

116. Divide and Conquer approach is known for

- A. Sequential algorithm development**
- B. parallel algorithm development
- C. Task defined algorithm
- D. Non defined Algorithm

117. The parallelism across branches require which scheduling

- A. Global scheduling**
- B. Local Scheduling
- C. post scheduling
- D. pre scheduling

118. Parallel processing may occur

- A. In the data stream**
- B. In instruction stream
- C. In network
- D. In transferring

119. Pipe-lining is a unique feature of \_\_\_\_\_.

- A. CISC
- B. RISC**
- C. ISA
- D. IANA

120. In MPI programming MPI\_char is the instruction for

- A. Unsigned Char
- B. Sign character**
- C. Long Char
- D. unsigned long char

---

## SET 2 (26 MCQs)

---

1. What is Cuda Architecture?

- a.CUDA Architecture included a unified shader pipeline, allowing each and every chip to be marshaled by a program.
- b.CUDA Architecture included a unified shader pipeline, allowing each and every unit on the chip to be marshaled by a program intending to perform general-purpose computations
- c.CUDA Architecture included a unified shader pipeline, allowing each and every logic unit on the chip to be marshaled by a program intending to perform general-purpose computations
- d.CUDA Architecture included a unified shader pipeline, allowing each and every arithmetic logic unit (ALU) on the chip to be marshaled by a program intending to perform general-purpose computations

**Ans.D**

2. For the following code write a kernel

```
__global__ void kernel( void ) { }
int main( void ) {
// Write a kernel here
printf( "Hello, World!\n" ); return 0; }
a.kernel<1, 1>(1,1);
b.kernel<<<1, 1>>>(1,1);
c.kernel<<<1, 1>>>();
d.kernel<<1, 1>>();
```

**Ans. c**

3. Find out which is the kernel from following code:

```
#include <iostream>
__global__ void add( int a, int b, int *c ) {
*c = a + b;
}
int main( void ) {
int c; int *dev_c;
HANDLE_ERROR( cudaMalloc( (void**)&dev_c, sizeof(int) ) );
add<<<1,1>>>( 2, 7, dev_c );
HANDLE_ERROR( cudaMemcpy( &c, dev_c, sizeof(int), cudaMemcpyDeviceToHost ) );
printf( "2 + 7 = %d\n", c );
cudaFree( dev_c );
return 0;
}
a.cudaMalloc( (void**)&dev_c, sizeof(int) )
b.add<<<1,1>>>(2, 7, dev_c)
c.add<<1,1>>( 2, 7, dev_c );
d.add<<<1,1>>>()
```

**Ans.b**

4. From following code which particular line is responsible for copying between device to host

```
#include <iostream>
__global__ void add( int a, int b, int *c ) {
*c = a + b;
}
int main( void ) {
int c; int *dev_c;
HANDLE_ERROR( cudaMalloc( (void**)&dev_c, sizeof(int) ) );
add<<<1,1>>>( 2, 7, dev_c );
HANDLE_ERROR( cudaMemcpy( &c, dev_c, sizeof(int), cudaMemcpyDeviceToHost ) );
printf( "2 + 7 = %d\n", c );
cudaFree( dev_c );
return 0;
}
a. c, dev_c, sizeof(int);
b. HANDLE_ERROR( &c, dev_c, sizeof(int), cudaMemcpyDeviceToHost );
c. HANDLE_ERROR( cudaMemcpy( &c, dev_c, sizeof(int), cudaMemcpyDeviceToHost ) );
d. cudaMemcpy( &c, dev_c, sizeof(int), cudaMemcpyDeviceToHost );
```

**Ans.c**

5. What is output of the following code:

```
#include <iostream>
__global__ void add( int a, int b, int *c ) {
*c = a + b;
}
int main( void ) {
int c; int *dev_c;
HANDLE_ERROR( cudaMalloc( (void**)&dev_c, sizeof(int) ) );
add<<<1,1>>>( 2, 7, dev_c );
HANDLE_ERROR( cudaMemcpy( &c, dev_c, sizeof(int), cudaMemcpyDeviceToHost ) );
printf( "2 + 7 = %d\n", c );
cudaFree( dev_c );
return 0;
}
a.2
b.9
c.7
d.0
```

**Ans. b**

6.what is function of e \_\_global\_\_ qualifier in cuda program

- a. alerts the compiler that a function should be compiled to run on a device instead of the host

- b. alerts the interpreter that a function should be compiled to run on a device instead of the host
- c. alerts the interpreter that a function should be interpreted to run on a device instead of the host
- d. alerts the interpreter that a function should be compiled to run on a host instead of the device

**ans.a**

7. The on-chip memory which is local to every multithreaded Single Instruction Multiple Data (SIMD) Processor is called

- a. Local Memory
- b. Global Memory
- c. Flash memory
- d. Stack

**Ans. a**

8. The machine object created by the hardware, managing, scheduling, and executing is a thread of

- a. DIMS instructions
- b. DMM instructions
- c. SIMD instructions
- d. SIM instructions

**Ans. c**

9. The primary and essential mechanism to support the sparse matrices is

- a. Gather-scatter operations
- b. Gather operations
- c. Scatter operations
- d. Gather-scatter technique

**Ans. a**

10. Which of the following architectures is/are not suitable for realizing SIMD ?

- a. Vector Processor
- b. Array Processor
- c. Von Neumann
- d. All of the above

**Ans . c**

11. Multithreading allowing multiple-threads for sharing the functional units of a

- a.Multiple processor
- b.Single processor
- c.Dual core
- d. Corei5

**Ans . b**

12. Which compiler is used to compile the cuide source code:

- a.gcc
- b.nvc++
- c.nc++

d.nvcc

**Ans.d**

13. which command line is used to execute a cuda program :

- a.nvcc hello.cu -o hello
- b.nvg++ heloo.cpp -o hello
- c.ncc hello.c -o hello
- D.g++ hello.cu -o hello

**Ans.a**

14.The syntax of kernel execution configuration is as follows

- a.<<< M , T >>> with a grid of M thread blocks. Each thread block has T parallel blocks
- b.<<< M , T >>> with a grid of M blocks. Each thread block has T parallel threads
- c.<<< M , T >>> with a grid of M thread blocks. Each thread block has T parallel threads
- d.<<< M , T >>> with a grid of M thread blocks. Each thread block has T threads

**Ans. c**

15.what it contains threadIdx.x

- A.contains the index of the thread within the block
- b.contains the index of the block within the thread
- c.contains the index of the thread size within the block
- d.contains the index of the block size within the thread

**Ans. A**

16.what it contains blockDim.x

- a.contains the size of block
- b.contains the size of block thread
- c.contains the size of thread block (number of threads in the thread block).
- d.the size of thread block

**Ans. c**

17.memory allocation of of variable x and y in cuda:

- A.float \*b, \*a;  
cudaMallocManaged(&, N\*sizeof(float));  
cudaMallocManaged(&, N\*sizeof(float));
- B.float \*x, \*y;  
cudaMallocManaged(&a, N\*sizeof(float));  
cudaMallocManaged(&b, N\*sizeof(float));
- C.float \*a, \*b;  
cudaMallocManaged(&x, N\*sizeof(float));  
cudaMallocManaged(&y, N\*sizeof(float));
- D.float \*x, \*y;  
cudaMallocManaged(&x, N\*sizeof(float));  
cudaMallocManaged(&y, N\*sizeof(float));

**Ans. D**

18. which function is used for free the memory in cuda

- a.cudaFree()
- b.Free()
- c.Cudafree()
- d.CudaFree()

**Ans. a**

19. Which of the following is *not* a form of parallelism supported by CUDA

- a.Vector parallelism - Floating point computations are executed in parallel on wide vector units
- b.Thread level task parallelism - Different threads execute a different tasks
- c.Block and grid level parallelism - Different blocks or grids execute different tasks
- d.Data parallelism - Different threads and blocks process different parts of data in memory

**Ans . a**

20.The style of parallelism supported on GPUs is best described as

- a.SISD - Single Instruction Single Data
- b.MISD - Multiple Instruction Single Data
- c.SIMT - Single Instruction Multiple Thread
- d.MIMD - Multiple Instruction Multiple Data

**Ans. c**

21. Which of the following correctly describes a GPU kernel

- a.A kernel may contain a mix of host and GPU code
- b.All thread blocks involved in the same computation use the same kernel
- c.A kernel is part of the GPU's internal micro-operating system, allowing it to act as an independent host
- d.All thread blocks involved in the same computation use the different kernel

**Ans .b**

22.Shared memory in CUDA is accessible to:

- a.All threads in a single block
- b.Both the host and GPU
- c.All threads associated with a single kernel
- d.one thread in a single block

**Ans.a**

23.Which of the following correctly describes the relationship between Warps, thread blocks, and CUDA cores?

- a.A warp is divided into a number of thread blocks, and each thread block executes on a single CUDA core
- b.A thread block may be divided into a number of warps, and each warp may execute on a single CUDA core
- c.A thread block is assigned to a warp, and each thread in the warp is executed on a separate CUDA core
- d. A block index is same as thread index

**Ans .b**

24. A processor assigned with a thread block, that executes a code ,which we usually call a
- A. multithreaded MIMD processor
  - b. multithreaded SIMD processor
  - c. multithreaded
  - D. multicore

**Ans. c**

25. Thread blocked altogether and being executed in the sets of 32 thread called as
- a.block of thread
  - b.thread block
  - c.thread
  - d.block

**Ans. b**

- 26.Who developed CUDA :

- a. ARM
- b. INTEL
- c. AMD
- d. NVIDIA

**Ans. d**

---

### **SET 3 (30 MCQs)**

---

## **Unit I**

1. Conventional architectures coarsely comprise of a\_

- A. A processor
- B. Memory system
- C Data path.
- D All of Above

2. Data intensive applications utilize\_

- A High aggregate throughput
  - B High aggregate network bandwidth
  - C High processing and memory system performance.
  - D None of above
3. A pipeline is like\_

**A Overlaps various stages of instruction execution to achieve performance.**

- B House pipeline
- C Both a and b
- D A gas line

4. Scheduling of instructions is determined\_

- A True Data Dependency
- B Resource Dependency
- C Branch Dependency
- D All of above**

5. VLIW processors rely on\_

- A Compile time analysis
- B Initial time analysis
- C Final time analysis
- D Mid time analysis

6. Memory system performance is largely captured by\_

- A Latency
- B Bandwidth
- C Both a and b**
- D none of above

7. The fraction of data references satisfied by the cache is called\_

- A Cache hit ratio**
- B Cache fit ratio
- B Cache best ratio
- C none of above

8. A single control unit that dispatches the same Instruction to various processors is\_

- A SIMD**
- B SPMD
- C MIMD
- D None of above

9. The primary forms of data exchange between parallel tasks are\_

- A Accessing a shared data space
- B Exchanging messages.
- C Both A and B**
- D None of Above

10. Switches map a fixed number of inputs to outputs.

- A True**
- B False

## Unit 2

1. The First step in developing a parallel algorithm is\_

- A. To Decompose the problem into tasks that can be executed concurrently**

- B. Execute directly
- C. Execute indirectly
- D. None of Above

2. The number of tasks into which a problem is decomposed determines its\_

**A. Granularity**

- B. Priority
- C. Modernity
- D. None of above

3. The length of the longest path in a task dependency graph is called\_

- A. the critical path length**
- B. the critical data length
  - C. the critical bit length
  - D. None of above

4. The graph of tasks (nodes) and their interactions/data exchange (edges)\_

- A. Is referred to as a *task interaction graph*  
B. Is referred to as a *task Communication graph*  
C. Is referred to as a *task interface graph*  
D. None of Above

5. Mappings are determined by\_

- A. task dependency  
B. task interaction graphs  
C. Both A and B  
D. None of Above

6. Decomposition Techniques are\_

- A. recursive decomposition  
B. data decomposition  
C. exploratory decomposition  
D. speculative decomposition  
E. All of Above

7. The *Owner Computes Rule* generally states that the process assigned a particular data item is responsible for\_

- A. All computation associated with it  
B. Only one computation  
C. Only two computation  
D. Only occasionally computation

8. A simple application of exploratory decomposition is\_

- A. The solution to a 15 puzzle  
B. The solution to 20 puzzle  
C. The solution to any puzzle  
D. None of Above

9. Speculative Decomposition consist of \_

- A. conservative approaches  
B. optimistic approaches  
C. Both A and B  
D. Only B

10. task characteristics include:

- A. Task generation.  
B. Task sizes.  
C. Size of data associated with tasks.

**D. All of Above**

**Unit 3**

1. Group communication operations are built using point-to-point messaging primitives  
**A. True**  
B. False
2. Communicating a message of size  $m$  over an uncongested network takes time  $ts + tmw$   
**A. True**  
B. False
3. The dual of one-to-all broadcast is\_  
**A. All-to-one reduction**  
B. All-to-one receiver  
C. All-to-one Sum  
D. None of Above
4. A hypercube has\_  
**A. 2d nodes**  
B.  $2^d$  nodes  
C.  $2^n$  Nodes  
D.  $N$  Nodes
5. A binary tree in which processors are (logically) at the leaves and internal nodes are routing nodes.  
**A. True**  
B. False
6. In All-to-All Broadcast each processor is the source as well as destination.  
**A. True**  
B. False
7. The Prefix Sum Operation can be implemented using the\_  
**A. All-to-all broadcast kernel.**  
B. All-to-one broadcast kernel.  
C. One-to-all broadcast Kernel  
D. Scatter Kernel

8. In the *scatter* operation\_

**A. Single node send a unique message of size m to every other node**

B. Single node send a same message of size m to every other node

C. Single node send a unique message of size m to next node

D. None of Above

9. The gather operation is exactly the inverse of the\_

**A. Scatter operation**

B. Broadcast operation

C. Prefix Sum

D. Reduction operation

10. In All-to-All Personalized Communication Each node has a distinct message of size m for every other node

**A. True**

B. False

---

#### **SET 4 ( MCQs)**

---

1.Message passing system allows processes to : a) communicate with one another without resorting to shared data b) communicate with one another by resorting to shared data c) share data d) name the recipient or sender of the message

**Ans-a**

2. An IPC facility provides at least two operations : a) write & delete message b) delete & receive message c) send & delete message d) receive & send message

**Ans- d**

3.Messages sent by a process : a) have to be of a fixed size b) have to be a variable size c) can be fixed or variable sized d) None of the mentioned

**Ans- c**

4.The link between two processes P and Q to send and receive messages is called : a) communication link b) message-passing link c) synchronization link d) all of the mentioned

**Ans- a**

5.In the Zero capacity queue : a) the queue can store at least one messageb) the sender blocks until the receiver receives the message c) the sender keeps sending and the messages don't wait in the queue d) none of the mentioned

**Ans- b**

6.Inter process communication :

- a) allows processes to communicate and synchronize their actions when using the same address space.
- b) allows processes to communicate and synchronize their actions without using the same address space.
- c) allows the processes to only synchronize their actions without communication.
- d) None of these

**Ans- b**

7.In the non blocking send :

- a) the sending process keeps sending until the message is received b) the sending process sends the message and resumes operation
- c) the sending process keeps sending until it receives a message
- d) None of these

**Ans- b**

8.In indirect communication between processes P and Q :

- a) there is another process R to handle and pass on the messages between P and Q
- b) there is another machine between the two processes to help communication
- c) there is a mailbox to help communication between P and Q
- d) None of these

**Ans- c**

9. In SIMD, elements of short vectors are processed in \_\_\_\_\_ a

- a) parallel
- b) one by one
- c )first come first serve basisd) on priority basis

**Ans- b**

10.Which one of the following the correct sequence

- a) SIMD < SIMT < SMT
- b) SIMD > SIMT > SMT
- c) SIMD < SIMT > SMT
- d) SIMD > SIMT < SMT

**Ans- a**

11.Single instruction is applied to a multiple data item to produce the \_\_\_ output(s).

- a)multiple
- b)different
- c)same

**Ans- c**

12. Which of the following is NOT a characteristic of parallel computing?

- a) Breaks a task into pieces
- b) Uses a single processor or computer
- c ) Simultaneous execution
- d) May use networking

**Ans- b**

13. Parallel computing uses \_\_\_\_\_ execution.

- a) sequential
- b) uniquec ) simultaneous
- d) none of the answers is correct.

**Ans- c**

14) A collection of lines that connects several devices is called .....

- A. bus
- B. peripheral connection wires
- C. Both a and b
- D. internal wires

**Answer: A. bus**

15) A complete microcomputer system consist of .....

- A. microprocessor
- B. memory
- C. peripheral equipment
- D. all of the above

**Answer: D. all of the above**

16) PC Program Counter is also called .....

- A. instruction pointer
- B. memory pointer
- C. data counter
- D. file pointer

**Answer: A. instruction pointer**

17) Data hazards occur when .....

- A. Greater performance loss
- B. Pipeline changes the order of read/write access to operands
- C. Some functional unit is not fully pipelined
- D. Machine size is limited

**Answer: B. Pipeline changes the order of read/write access to operands**

18) Which of the following bus is used to transfer data from main memory to peripheral device?

- A. DMA bus
- B. Output bus
- C. Data bus
- D. All of the above

**Answer: C. Data bus**

19) Micro instructions are stored in

- A. computer memory
- B. primary storage

- C. secondary storage
- D. control memory

E. cache memory

**Answer: D. control memory**

20. Pipeline processing implement

A. fetch instruction

B. decode instruction

C. fetch operand

D. calculate operand

E. execute instruction

F. all of the above

**Answer: F. all of the above**

21) Instruction pipelining has minimum stages

A. 4

B. 2

C. 3

D. 6

**Answer: B. 2**

22). Systems that do not have parallel processing capabilities are

A. SISD

B. SIMD

C. MIMD

D. All of the above

**Answer: A. SISD**

23) Who is regarded as the founder of Computer Architecture?

A. Alan Turing

B. Konrad Zuse

C. John von Neumann

D. John William Mauchly

E. None of the answers above is correct

**Answer: C. John von Neumann**

24). What is characteristic for the organization of a computer architecture?

A. Size

B. Dynamic behaviour

C. Static behaviour

D. Speed

E. None of the answers above is correct

**Answer: B. Dynamic behaviour**

25). What is usually regarded as the von Neumann Bottleneck?

A. Processor/memory interface

- B. Control unit
- C. Arithmetic logical unit
- D. Instruction set
- E. None of the answers above is correct

**Answer: A. Processor/memory interface**

26) How does the number of transistors per chip increase according to Moore 's law?

- A. Quadratically
- B. Linearly
- C. Cubically
- D. Exponentially
- E. None of the answers above is correct

**Answer: D. Exponentially**

27) Which value has the speedup of a parallel program that achieves an efficiency of 75% on 32 processors?

- A. 18
- B. 24
- C. 16
- D. 20
- E. None of the answers above is correct

**Answer: B. 24**

28). Pipelining strategy is called implement

- A. instruction execution
- B. instruction prefetch
- C. instruction decoding
- D. instruction manipulation

**Answer: B. instruction prefetch**

29). The concept of pipelining is most effective in improving performance if the tasks being performed in different stages :

- A. require different amount of time
- B. require about the same amount of time
- C. require different amount of time with time difference between any two tasks being same
- D. require different amount with time difference between any two tasks being different

**Answer: B. require about the same amount of time**

30) Which Algorithm is better choice for pipelining?

- A. Small Algorithm
- B. Hash Algorithm
- C. Merge-Sort Algorithm
- D. Quick-Sort Algorithm

**Answer: C. Merge-Sort Algorithm**

31) The expression 'delayed load' is used in context of

- A. processor-printer communication

- B. memory-monitor communication
- C. pipelining
- D. none of the above

**Answer: C. pipelining**

32 ) Parallel processing may occur

- A. in the instruction stream
- B. in the data stream
- C. both[A] and [B]
- D. none of the above

**Answer: C. both[A] and [B]**

33 ) The cost of a parallel processing is primarily determined by :

- A. Time Complexity
- B. Switching Complexity
- C. Circuit Complexity
- D. None of the above

**Answer: C. Circuit Complexity**

34 ) An instruction to provide small delay in program

- A. LDA
- B. NOP
- C. BEA
- D. None of the above

**Answer: B. NOP**

35 )Characteristic of RISC (Reduced Instruction Set Computer) instruction set is

- A. three instructions per cycle
- B. two instructions per cycle
- C. one instruction per cycle
- D. none of the

**Answer: C. one instruction per cycle**

36) In daisy-chaining priority method, all the devices that can request an interrupt are connected in

- A. parallel
- B. serial
- C. random
- D. none of the above

**Answer: B. serial**

37 ) Which one of the following is a characteristic of CISC (Complex Instruction Set Computer)

- A. Fixed format instructions
- B. Variable format instructions
- C. Instructions are executed by hardware
- D. None of the above

**Answer: B. Variable format instructions**

38). During the execution of the instructions, a copy of the instructions is placed in the \_\_\_\_\_ .

- A. Register
- B. RAM
- C. System heap
- D. Cache

**Answer: D. Cache**

39 ) Two processors A and B have clock frequencies of 700 Mhz and 900 Mhz respectively.

Suppose A can execute an instruction with an average of 3 steps and B can execute with an average of 5 steps. For the execution of the same instruction which processor is faster ?

- A. A
- B. B
- C. Both take the same time
- D. Insufficient information

**Answer: A. A**

40 )A processor performing fetch or decoding of different instruction during the execution of another instruction is called \_\_\_\_\_ .

- A. Super-scaling
- B. Pipe-lining
- C. Parallel Computation
- D. None of these

**Answer: B. Pipe-lining**

41 ) For a given FINITE number of instructions to be executed, which architecture of the processor provides for a faster execution ?

- A. ISA
- B. ANSA
- C. Super-scalar
- D. All of the above

**Answer: C. Super-scalar**

42 )The clock rate of the processor can be improved by,

- A. Improving the IC technology of the logic circuits
- B. Reducing the amount of processing done in one step
- C. By using overclocking method
- D. All of the above

**Answer: D. All of the above**

43 )An optimizing Compiler does,

- A. Better compilation of the given piece of code.
- B. Takes advantage of the type of processor and reduces its process time.
- C. Does better memory management.
- D. Both a and c

**Answer: B. Takes advantage of the type of processor and reduces its process time.**

- 44 )The ultimate goal of a compiler is to,
- A. Reduce the clock cycles for a programming task.
  - B. Reduce the size of the object code.
  - C. Be versatile.
  - D. Be able to detect even the smallest of errors.

**Answer: A. Reduce the clock cycles for a programming task.**

- 45 )To which class of systems does the von Neumann computer belong?

- A. SIMD (Single Instruction Multiple Data)
- B. MIMD (Multiple Instruction Multiple Data)
- C. MISD (Multiple Instruction Single Data)
- D. SISD (Single Instruction Single Data)
- E. None of the answers above is correct.

**Answer: D. SISD (Single Instruction Single Data)**

- 46). Parallel programs: 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?

- A. Infinite speedup
- B. 5
- C. 20
- D. 50
- E. None of the answers above is correct.

**Answer: C. 20**

- 47). Itanium processor: Which hazard can be circumvented by register rotation?

- A. Control hazards
- B. Data hazards
- C. Structural hazards
- D. None
- E. None of the answers above is correct.

**Answer: B. Data hazards**

- 48 Which MIMD systems are best scalable with respect to the number of processors?

- A. Distributed memory computers
- B. ccNUMA systems
- C. nccNUMA systems
- D. Symmetric multiprocessors
- E. None of the answers above is correct

**Answer: A. Distributed memory computers**

- 49 ). Cache coherence: For which shared (virtual) memory systems is the snooping protocol suited?

- A. Crossbar connected systems
- B. Systems with hypercube network
- C. Systems with butterfly network

- D. Bus based systems
- E. None of the answers above is correct.

**Answer: D. Bus based systems**

50 )Parallel processing may occur

- A. in the instruction stream
- B. in the data stream
- C. both[A] and [B]
- D. none of the above

**Answer: C. both[A] and [B]**

51). The cost of a parallel processing is primarily determined by :

- A. Time Complexity
- B. Switching Complexity
- C. Circuit Complexity
- D. None of the above

**Answer: C. Circuit Complexity**

## Unit 2

1. The best mode of connection between devices which need to send or receive large amounts of data over a short distance is \_\_\_\_\_

- a) BUS
- b) Serial port
- c) Parallel port
- d) Isochronous port

[View Answer](#)

**Answer: c**

Explanation: The parallel port transfers around 8 to 16 bits of data simultaneously over the lines, hence increasing transfer rates.

8. In the output interface of the parallel port, along with the valid signal \_\_\_\_\_ is also sent.

- a) Data
- b) Idle signal
- c) Interrupt
- d) Acknowledge signal

[View Answer](#)

**Answer: b**

Explanation: The idle signal is used to check if the device is idle and ready to receive data.

3. Parallel computing uses \_\_\_\_\_ execution.

- a) sequential
- b) unique
- c) simultaneous
- d) none of the above

**ans c**

4. Heap can be used as \_\_\_\_\_

- a) Priority queue
- b) Stack
- c) A decreasing order array
- d) None of the mentioned

**Answer: a**

Explanation: The property of heap that the value of root must be either greater or less than both of its children makes it work like a priority queue.

6. Which of the following is true about parallel computing performance?

- a. Computations use multiple processors.
- b. There is an increase in speed.
- c. The increase in speed is loosely tied to the number of processor or computers used.
- d. All of the answers are correct.

**ANS: a**

7. Which of the following is NOT a characteristic of parallel computing?

- a. Breaks a task into pieces
- b. Uses a single processor or computer
- c. Simultaneous execution
- d. May use networking

**ans: b**

**8)** Decentralized computing B. Parallel computing C. Centralized computing D. Decentralized computing E. Distributed computing F. All of these G. None of these

**Answer- A**

9) Writing parallel programs is referred to as

- A. Parallel computation B. Parallel processes C. Parallel development D. Parallel programming
- E. Parallel computation F. All of these G. None of these

**Answer- D**

**10) In which application system Distributed systems can run well?**

- A. HPC D. HTC C. HRC
- D. Both A and B E. All of these F. None of these

**Answer- D**

**11) In which systems desire HPC and HTC.**

- A. Adaptivity B. Transparency C. Dependency D. Secretive E. Adaptivity F. All of these G. None of these

**Answer- B**

**12) No special machines manage the network of architecture in which resources are known as**

- A. Peer-to-Peer B. Space based C. Tightly coupled D. Loosely coupled E. All of these F. None of these

**Answer- A**

- 13) **Virtualization that creates one single address space architecture that of, is called**  
A. Loosely coupled B. Peer-to-Peer C. Space-based D. Tightly coupled E. Loosely coupled F.  
All of these G. None of these

**Answer- C**

- 14) **Uniprocessor computing devices is called\_\_\_\_\_.**  
A. Grid computing B. Centralized computing C. Parallel computing D. Distributed computing E.  
All of these F. None of these

**Answer- B**

- 15) **Utility computing focuses on a\_\_\_\_\_ model.**  
A. Data B. Cloud C. Scalable D. Business E. All of these F. None of these

**Answer- D**

- 16) **Aberavationn of HPC**  
A. High-peak computing B. High-peripheral computing  
C. High-performance computing  
D. Highly-parallel computing  
E. All of these  
F. None of these

**Answer- C**

- 17) **Peer-to-Peer leads to the development of technologies like**  
A. Norming grids  
B. Data grids  
C. Computational grids  
D. Both A and B  
E. All of these  
F. None of these

**Answer- D**

- 18) **Type of HPC applications of.**  
A. Management B. Media mass C. Business D. Science E. All of these F. None of these

**Answer- D**

- 20) **Utilization rate of resources in an execution model is known to be its**  
A. Adaptation B. Efficiency C. Dependability D. Flexibility E. All of these F. None of these

**Answer- B**

- 21) **Interprocessor communication that takes place**  
A. Centralized memory B. Shared memory C. Message passing D. Both A and B E. All of these  
F. None of these

**Answer- D**

22) Data centers and centralized computing covers many and  
A. Microcomputers B. Minicomputers C. Mainframe computers D. Supercomputers E. All of these F. None of these

**Answer: D**

23) Execution of several activities at the same time. a) processing b) parallel processing c) serial processing d) multitasking

**Answer: b**

24) Parallel processing has single execution flow. a) True b) False

**Answer: b**

25) A term for simultaneous access to a resource, physical or logical. a) Multiprogramming b) Multitasking c) Threads d) Concurrency

**Answer: D**

26) \_\_\_\_\_ leads to concurrency. a) Serialization b) Parallelism c) Serial processing d)

Distribution

**Answer: b**

27) A parallelism based on increasing processor word size. a) Increasing b) Count based c) Bit based d) Bit leve

**Answer: d**

28) A type of parallelism that uses micro architectural techniques. a) instructional b) bit level c) bit based d) increasing

**Answer: A**

29) MIPS stands for? a) Mandatory Instructions/sec b) Millions of Instructions/sec c) Most of Instructions/sec d) Many Instructions / sec

**Answer: B**

30) Several instructions execution simultaneously in \_\_\_\_\_ a) processing b)  
parallel processing c) serial processing d) multitasking

**Answer: B**

31) Computer has a built-in system clock that emits millions of regularly spaced electric pulses per \_\_\_\_\_ called clock cycles. a) second b) millisecond c) microsecond d) minute

**Answer: a**

32) It takes one clock cycle to perform a basic operation. a) True b) False

**Answer: a**

33) The operation that does not involves clock cycles is \_\_\_\_\_ a) Installation of a device b)  
Execute c) Fetch d) Decode

**Answer: a**

34). The number of clock cycles per second is referred as \_\_\_\_\_ a) Clock speed b) Clock frequency c) Clock rate d) Clock timing

**Answer: a**

35). CISC stands for \_\_\_\_\_ a) Complex Information Sensed CPU b) Complex Instruction Set Computer c) Complex Intelligence Sensed CPU d) Complex Instruction Set CPU

**Answer: b**

36). Which of the following processor has a fixed length of instructions? a) CISC b) RISC c) EPIC d) Multi-core

**Answer: b**

37). Processor which is complex and expensive to produce is \_\_\_\_\_ a) RISC b) EPIC c) CISC d) Multi-core

**Answer: c**

38). The architecture that uses a tighter coupling between the compiler and the processor is \_\_\_\_\_ a) EPIC b) Multi-core c) RISC d) CISC

**Answer: a**

39). MAR stands for \_\_\_\_\_ a) Memory address register b) Main address register c) Main accessible register

d) Memory accessible register

**Answer: a.**

40). A circuitry that processes that responds to and processes the basic instructions that are required to drive a computer system is \_\_\_\_\_ a) Memory b) ALU c) CU d) Processor

**Answer: d**

41) The graph of tasks (nodes) and their interactions/data exchange (edges)\_

- A. Is referred to as a task interaction graph
- B. Is referred to as a task Communication graph
- C. Is referred to as a task interface graph
- D. None of Above

**Answer: A**

42) task characteristics include:

- A) Task generation.
- B) Task sizes.
- C) Size of data associated with tasks.
- D) All of Above**

**Answer: D**

43). Decomposition Techniques are\_

- A. recursive decomposition
- B. data decomposition

- C. exploratory decomposition
- D. speculative decomposition
- E. All of Above

**Answer: E**

44) The *Owner Computes Rule* generally states that the process assigned a particular data item is responsible for—

- A. All computation associated with it
- B. Only one computation
- C. Only two computation
- D. Only occasionally computation

**Answer: A**

### **Unit 3**

1.Which topology requires a central controller or hub?

- a.Mesh
- b.Star
- c.Bus
- d.Ring

**Ans:- b**

2.Which topology requires a multipoint connection?

- a.Mesh
- b.Star
- c.Bus
- d.Ring

**Ans:- c**

3 Multipoint topology is

- a.Bus
- b.Star
- c.Mesh
- d.Ring

**Ans:- a**

4.In mesh topology, every device has a dedicated topology of

- a.Multipoint linking
- b.Point to point linking
- c.None of Above
- d.Both a and b

**Ans:- a**

5 .Bus, ring and star topologies mostly used in the

- a.LAN
- b.MAN

- c.WAN
- d.Internetwork

**Ans:- a**

6 Combination of two or more topologies are called

- a.Star
- b.Bus
- c.Ring
- d.Hybrid

**Ans:- d**

7 The topology with highest reliability is ?

- a.Bus topology
- b.Star topology
- c.Ring Topology
- d.Mesh Topology

**Ans:- d**

8 .Star Topology is Based On a Central Device that can be \_\_\_\_\_ ?

- a.HUB
- b.Switch
- c.Only a
- d.Both a and b

**Ans:- d**

9.Which of the following is not type of the network topology?

- a.Mesh
- b.Bus
- c.Ring
- d.stub

**Ans:- d**

10.In a star-topology Ethernet LAN, \_\_\_\_\_ is just a point where the signals coming from different stations collide; it is the collision point.

- a.An active hub
- b.A passive hub
- c.either (a) or (b)
- d.neither (a) nor (b)

**Ans:- b**

11) Group communication operations are built using point-to-point messaging primitives

**A. True**

B. False

**Ans:- A**

12) A hypercube has\_

**A. 2d nodes**

- B. 2d nodes
- C. 2n Nodes
- D. N Nodes

**Ans:- A**

13) The function of multiplexing is

- a. To reduce the bandwidth of the signal to be transmitted
- b. To combine multiple data streams over a single data channel
- c. To allow multiple data streams over multiple channels in a prescribed format
- d. To match the frequencies of the signal at the transmitter as well as the receiver

**Ans: b**

14) A 3 GHz carrier is DSB SC modulated by a signal with maximum frequency of 2 MHz. The minimum sampling frequency required for the signal so that the signal is ideally sampled is

- a. 4 MHz
- b. 6 MHz
- c. 6.004 GHz
- d. 6 GHz

**Ans: c**

15) Emitter modulator amplifier for Amplitude Modulation

- a. Operates in class A mode
- b. Has a low efficiency
- c. Output power is small
- d. All of the above

**Ans: d**

16) Super heterodyne receivers

- a. Have better sensitivity
- b. Have high selectivity
- c. Need extra circuitry for frequency conversion
- d. All of the above

**Ans: d**

17) The AM spectrum consists of

- a. Carrier frequency
- b. Upper side band frequency
- c. Lower side band frequency
- d. All of the above

**Ans: d**

18) Standard intermediate frequency used for AM receiver is

- a. 455 MHz
- b. 455 KHz
- c. 455 Hz
- d. None of the above

**Ans: b**

19) In the TV receivers, the device used for tuning the receiver to the incoming signal is  
a. Varactor diode

b. High pass Filter

c. Zener diode

d. Low pass filter

**Ans: a**

20) The modulation technique that uses the minimum channel bandwidth and transmitted power is  
is

a. FM

b. DSB-SC

c. VSB

d. SSB

**Ans: d**

21) Calculate the bandwidth occupied by a DSB signal when the modulating frequency lies in the range from 100 Hz to 10KHz.

a. 28 KHz

b. 24.5 KHz

c. 38.6 KHz

d. 19.8 KHz

**Ans: d**

**23)What is a high performance multi-core processor that can be used to accelerate a wide variety of applications using parallel computing.**

1. CLU

2. GPU

3. CPU

4. DSP

**ANS-2**

**24) What is GPU?**

1. Grouped Processing Unit

2. Graphics Processing Unit

3. Graphical Performance Utility

4. Graphical Portable Unit

**ANS-2**

**25. A code, known as GRID, which runs on GPU consisting of a set of**

1. 32 Thread

2. 32 Block

3. Unit Block

4. Thread Block

**ANS-4**

**26. Interprocessor communication that takes place**

- 1. Centralized memory
- 2. Shared memory
- 3. Message passing
- 4. Both A and B

**ANS-4**

**27. Decomposition into a large number of tasks results in coarse-grained decomposition**

- 1. True
- 2. False

**ANS-2**

**28. The fetch and execution cycles are interleaved with the help of \_\_**

- 1. Modification in processor architecture
- 2. Clock
- 3. Special unit
- 4. Control unit

**ANS-2**

**29. The processor of system which can read /write GPU memory is known as**

- 1. kernal
- 2. device
- 3. Server
- 4. Host

**ANS-4**

**30. Increasing the granularity of decomposition and utilizing the resulting concurrency to perform more tasks in parallel decreases performance.**

- 1. TRUE
- 2. FALSE

**ANS-2**

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### SET 5 (MCQs)

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What are the sources of overhead?

- A. Essential /Excess Computation
- B. Inter-process Communication
- C. Idling
- D. All above

**Answer : D**

Which are the performance metrics for parallel systems?

- A. Execution Time
- B. Total Parallel Overhead
- C. Speedup
- D. Efficiency
- E. Cost
- F. All above

**Answer : F**

The efficiency of a parallel program can be written as:  $E = Ts / pTp$ . True or False?

- A. True
- B. False

**Answer : A**

Overhead function or **total overhead** of a parallel system as the total time collectively spent by all the processing elements over and above that required by the fastest known sequential algorithm for solving the same problem on a single processing element.

True or False?

- A. True
- B. False

**Answer : A**

What is Speedup?

- A. A measure that captures the relative benefit of solving a problem in parallel. It is defined as the ratio of the time taken to solve a problem on a single processing element to the time required to solve the same problem on a parallel computer with  $p$  identical processing elements.
- B. A measure of the fraction of time for which a processing element is usefully employed.
- C. None of the above

**Answer : A**

In an ideal parallel system, speedup is equal to  $p$  and efficiency is equal to one. True or False?

- A. True
- B. False

**Answer : A**

A parallel system is said to be \_\_\_\_\_ if the cost of solving a problem on a parallel computer has the same asymptotic growth (in  $\Theta$  terms) as a function of the input size as the fastest-known sequential algorithm on a single processing element.

- A. Cost optimal
- B. Non Cost optimal

**Answer : A**

Using fewer than the maximum possible number of processing elements to execute a parallel algorithm is called \_\_\_\_\_ a parallel system in terms of the number of

processing elements.

- A. Scaling down
- B. Scaling up

**Answer : B**

The \_\_\_\_\_ function determines the ease with which a parallel system can maintain a constant efficiency and hence achieve speedups increasing in proportion to the number of processing elements.

- A. Isoefficiency
- B. Efficiency
- C. Scalability
- D. Total overhead

**Answer : A**

Minimum execution time for adding n numbers is  $T_p = n/p + 2 \log p$  True or False ?

- A. True
- B. False

**Answer : A**

The overhead function  $To = pTP - TS$ .

- A. True
- B. False

**Answer : A**

Performance Metrics for Parallel Systems: Speedup(S) = $TS/TP$

- A. True
- B. False

**Answer : A**

Matrix Vector multiplication 2D Partitions requires some basic communication operations

- A. one-to-one communication to align the vector along the main diagonal
- B. one-to-all broadcast of each vector element among the n processes of each column
- C. all-to-one reduction in each row
- D. All Above

**Answer : D**

What are the issues in sorting?

- A. Where the Input and Output Sequences are Stored
- B. How Comparisons are Performed
- C. All above

**Answer : C**

The parallel run time of the formulation for Bubble sort is

- A.  $T_p = O(n/p \log n/p) + O(n) + O(n)$
- B.  $T_p = O(n/p \log n/p) + O(n/p \log p) + O(\ln p)$
- C. Non of the above

**Answer : A**

What are the variants of Bubble sort?

- A. Shell sort
- B. Quick sort
- C. Odd-Even transposition
- D. Option A & C

**Answer : D**

What is the overall complexity of parallel algorithm for quick sort?

- A.  $T_p = O(n/p \log n/p) + O(n/p \log p) + O(\log 2p)$
- B.  $T_p = O(n/p \log n/p) + O(n/p \log p)$
- C.  $T_p = O(n/p \log n/p) + O(\log 2p)$

**Answer : A**

Formally, given a weighted graph  $G(V, E, w)$ , the ***all-pairs shortest paths*** problem is to find the shortest paths between all pairs of vertices. True or False?

- A. True
- B. False

**Answer : A**

What is true for parallel formulation of Dijkstra's Algorithm?

- A. One approach partitions the vertices among different processes and has each process compute the single-source shortest paths for all vertices assigned to it. We refer to this approach as the ***source-partitioned formulation***.
- B. Another approach assigns each vertex to a set of processes and uses the parallel formulation of the single-source algorithm to solve the problem on each set of processes. We refer to this approach as the ***source-parallel formulation***.
- C. Both are true
- D. Non of these is true

**Answer : C**

Search algorithms can be used to solve discrete optimization problems. True or False ?

- A. True

- B. False

**Answer : A**

Examples of Discrete optimization problems are ;

- A. planning and scheduling,
- B. The optimal layout of VLSI chips,
- C. Robot motion planning,
- D. Test-pattern generation for digital circuits, and logistics and control.
- E. All of above

**Answer : E**

List the important parameters of Parallel DFS

- A. Work- Splitting Strategies
- B. Load balancing Schemes
- C. All of above

**Answer : C**

List the communication strategies for parallel BFS.

- A. Random communication strategy
- B. Ring communication strategy
- C. Blackboard communication strategy
- D. All of above

**Answer : D**

The lower bound on any comparison-based sort of  $n$  numbers is  $\Theta(n \log n)$

- A. True
- B. False

**Answer : A**

In a compare-split operation

- A. Each process sends its block of size  $n/p$  to the other process
- B. Each process merges the received block with its own block and retains only the appropriate half of the merged block
- C. Both A & B

**Answer : C**

In a typical sorting network

- A. Every sorting network is made up of a series of columns
- B. Each column contains a number of comparators connected in parallel
- C. Both A & B

**Answer : C**

Bubble sort is difficult to parallelize since the algorithm has no concurrency

- A. True
- B. False

**Answer : A**

## Unit I

1. Conventional architectures coarsely comprise of a\_

- A. A processor
- B. Memory system
- C Data path.

**D All of Above**

2. Data intensive applications utilize\_

- A High aggregate throughput**
- B High aggregate network bandwidth

C High processing and memory system performance.  
D None of above

3. A pipeline is like\_

**A Overlaps various stages of instruction execution to achieve performance.**

- B House pipeline
- C Both a and b
- D A gas line

4. Scheduling of instructions is determined\_

- A True Data Dependency
- B Resource Dependency
- C Branch Dependency
- D All of above**

5. VLIW processors rely on\_

- A Compile time analysis**
- B Initial time analysis
- C Final time analysis
- D Mid time analysis

6. Memory system performance is largely captured by\_

- A Latency
- B Bandwidth
- C Both a and b**
- D none of above

7. The fraction of data references satisfied by the cache is called\_

- A Cache hit ratio**
- B Cache fit ratio
- B Cache best ratio
- C none of above

8. A single control unit that dispatches the same Instruction to various processors is\_

- A SIMD**
- B SPMD
- C MIMD
- D None of above

9. The primary forms of data exchange between parallel tasks are\_

- A Accessing a shared data space
- B Exchanging messages.
- C Both A and B**
- D None of Above

10. Switches map a fixed number of inputs to outputs.

A True

B False

## Unit 2

1. The First step in developing a parallel algorithm is\_

**A. To Decompose the problem into tasks that can be executed concurrently**

B. Execute directly

C. Execute indirectly

D. None of Above

2. The number of tasks into which a problem is decomposed determines its\_

**A. Granularity**

B. Priority

C. Modernity

D. None of above

3. The length of the longest path in a task dependency graph is called\_

**A. the critical path length**

B. the critical data length

C. the critical bit length

D. None of above

4. The graph of tasks (nodes) and their interactions/data exchange (edges)\_

**A. Is referred to as a *task interaction graph***

B. Is referred to as a *task Communication graph*

C. Is referred to as a *task interface graph*

D. None of Above

5. Mappings are determined by\_

A. task dependency

B. task interaction graphs

**C. Both A and B**

D. None of Above

6. Decomposition Techniques are\_

A. recursive decomposition

B. data decomposition

C. exploratory decomposition

D. speculative decomposition

**E. All of Above**

7. The *Owner Computes Rule* generally states that the process assigned a particular data item is responsible for\_

**A. All computation associated with it**

B. Only one computation

C. Only two computation

- D. Only occasionally computation
8. A simple application of exploratory decomposition is\_
- A. **The solution to a 15 puzzle**
- B. The solution to 20 puzzle
- C. The solution to any puzzle
- D. None of Above
9. Speculative Decomposition consist of \_
- A. conservative approaches
- B. optimistic approaches
- C. **Both A and B**
- D. Only B
10. task characteristics include:
- A. Task generation.
- B. Task sizes.
- C. Size of data associated with tasks.
- D. **All of Above**

### Unit 3

1. Group communication operations are built using point-to-point messaging primitives
- A. **True**
- B. False
2. Communicating a message of size  $m$  over an uncongested network takes time  $ts + tmw$
- A. **True**
- B. False
3. The dual of one-to-all broadcast is\_
- A. **All-to-one reduction**
- B. All-to-one receiver
- C. All-to-one Sum
- D. None of Above
4. A hypercube has\_
- A. **2d nodes**
- B.  $2d$  nodes
- C.  $2n$  Nodes
- D.  $N$  Nodes
5. A binary tree in which processors are (logically) at the leaves and internal nodes are routing nodes.
- A. **True**
- B. False

6. In All-to-All Broadcast each processor is the source as well as destination.

- A. **True**
- B. False

7. The Prefix Sum Operation can be implemented using the\_

- A. **All-to-all broadcast kernel.**
- B. All-to-one broadcast kernel.
- C. One-to-all broadcast Kernel
- D. Scatter Kernel

8. In the *scatter* operation\_

- A. **Single node send a unique message of size m to every other node**
- B. Single node send a same message of size m to every other node
- C. Single node send a unique message of size m to next node
- D. None of Above

9. The gather operation is exactly the inverse of the\_

- A. **Scatter operation**
- B. Broadcast operation
- C. Prefix Sum
- D. Reduction operation

10. In All-to-All Personalized Communication Each node has a distinct message of size m for every other node

- A. **True**
- B. False

1. It is \_\_\_\_\_ strength and \_\_\_\_\_ permeability.

- a) High, high
- b) Low, low
- c) High, low
- d) Low, high

[View Answer](#)

**Answer: c**

Explanation: It is specifically chosen so as to have particularly appropriate properties for the expected use of the structure such as high strength and low permeability.

2. High Performance concrete works out to be economical.

- a) True
- b) False

[View Answer](#)

**Answer: a**

Explanation: High Performance concrete works out to be economical, even though its initial cost is high.

3. HPC is not used in high span bridges.

a) True

b) False

[View Answer](#)

**Answer: b**

Explanation: Major applications of high-performance concrete in the field of Civil Engineering constructions have been in the areas of long-span bridges, high-rise buildings or structures, highway pavements, etc.

4. Concrete having 28- days' compressive strength in the range of 60 to 100 MPa.

a) HPC

b) VHPC

c) OPC

d) HSC

[View Answer](#)

**Answer: a**

Explanation: High Performance Concrete having 28- days' compressive strength in the range of 60 to 100 MPa

5. Concrete having 28-days compressive strength in the range of 100 to 150 MPa.

a) HPC

b) VHPC

c) OPC

d) HSC

[View Answer](#)

**Answer: b**

Explanation: Very high performing Concrete having 28-days compressive strength in the range of 100 to 150 MPa.

6. High-Performance Concrete is \_\_\_\_\_ as compared to Normal Strength Concrete.

a) Less brittle

b) Brittle

c) More brittle

d) Highly ductile

[View Answer](#)

**Answer: c**

Explanation: High-Performance Concrete is more brittle as compared to Normal Strength Concrete (NSC), especially when high strength is the main criteria

7. The choice of cement for high-strength concrete should not be based only on mortarcube tests but it should also include tests of compressive strengths of concrete at \_\_\_\_\_ days.

a) 28, 56, 91

b) 28, 60, 90

c) 30, 60, 90

d) 30, 45, 60

[View Answer](#)

**Answer: a**

Explanation: The choice of cement for high-strength concrete should not be based only on mortar-cube tests but it should also include tests of compressive strengths of concrete at 28, 56, and 91 days.

8. For high-strength concrete, a cement should produce a minimum 7-days mortar-cube strength of approximately \_\_\_\_ MPa.

a) 10

b) 20

c) 30

d) 40

[View Answer](#)

**Answer: c**

Explanation: For high-strength concrete, a cement should produce a minimum 7-days mortar-cube strength of approximately 30 MPa.

9. \_\_\_\_\_ mm nominal maximum size aggregates gives optimum strength.

a) 9.5 and 10.5

b) 10.5 and 12.5

c) 9.5 and 12.5

d) 11.5 and 12.5

[View Answer](#)

**Answer: c**

Explanation: Many studies have found that 9.5 mm to 12.5 mm nominal maximum size aggregates gives optimum strength.

10. Due to low w/c ratio \_\_\_\_\_

a) It doesn't cause any problems

b) It causes problems

c) Workability is easy

d) Strength is more

[View Answer](#)

**Answer: b**

Explanation: Due to the low w/c ratio, it causes problems so superplasticizers are used.

Which of the following statements are true with regard to compute capability in CUDA

A. Code compiled for hardware of one compute capability will not need to be recompiled to run on hardware of another

B. Different compute capabilities may imply a different amount of local memory per thread

C. Compute capability is measured by the number of FLOPS a GPU accelerator can compute.

**Answer : B**

True or False: The threads in a thread block are distributed across SM units so that each thread is executed by one SM unit.

- A. True
- B. False

**Answer : B**

The style of parallelism supported on GPUs is best described as

- A. SISD - Single Instruction Single Data
- B. MISD - Multiple Instruction Single Data
- C. SIMD - Single Instruction Multiple Thread

**Answer : C**

True or false: Functions annotated with the `__global__` qualifier may be executed on the host or the device

- A. True
- B. Flase

**Answer : A**

Which of the following correctly describes a GPU kernel

- A. A kernel may contain a mix of host and GPU code
- B. All thread blocks involved in the same computation use the same kernel
- C. A kernel is part of the GPU's internal micro-operating system, allowing it to act as an independent host

**Answer : B**

Which of the following is *not* a form of parallelism supported by CUDA

- A. Vector parallelism - Floating point computations are executed in parallel on wide vector units
- B. Thread level task parallelism - Different threads execute a different tasks
- C. Block and grid level parallelism - Different blocks or grids execute different tasks
- D. Data parallelism - Different threads and blocks process different parts of data in memory

**Answer :A**

What strategy does the GPU employ if the threads within a warp diverge in their execution?

- A. Threads are moved to different warps so that divergence does not occur within a single warp
- B. Threads are allowed to diverge
- C. All possible execution paths are run by all threads in a warp serially so that thread instructions do not diverge

**Answer : C**

Which of the following does *not* result in uncoalesced (i.e. serialized) memory access on the K20 GPUs installed on Stampede

- A. Aligned, but non-sequential access
- B. Misaligned data access

C. Sparse memory access

**Answer : A**

Which of the following correctly describes the relationship between Warps, thread blocks, and CUDA cores?

- A. A warp is divided into a number of thread blocks, and each thread block executes on a single CUDA core
- B. A thread block may be divided into a number of warps, and each warp may execute on a single CUDA core
- C. A thread block is assigned to a warp, and each thread in the warp is executed on a separate CUDA core

**Answer : B**

Shared memory in CUDA is accessible to:

- A. All threads in a single block
- B. Both the host and GPU
- C. All threads associated with a single kernel

**Answer : A**

CUDA Architecture CPU consist of

- A. CUDA Libraries
- B. CUDA Runtime
- C. CUDA Driver
- D. All Above

**Answer : D**

CUDA platform works on

- A. C
- B. C++
- C. Fortran
- D. All Above

**Answer : D**

Threads support Shared memory and Synchronization

- A. True
- B. False

**Answer : A**

Application of CUDA are

- A. Fast Video Transcoding
- B. Medical Imaging
- C. Computational Science
- D. Oil and Natural Resources exploration
- E. All Above

**Answer : E**

GPU execute device code

- A. True
- B. False

**Answer : A**

---

### SET 6 (MCQs)

---

1) Execution of several activities at the same time.

- a) processing b) parallel processing c) serial processing d) multitasking

Ans: b Explanation:

2)

Parallel processing has single execution flow.

- a) True b) False

Ans: b Explanation: The statement is false. Sequential programming specifically has single execution flow.

3)

A term for simultaneous access to a resource, physical or logical.

- a) Multiprogramming b) Multitasking c) Threads d) Concurrency

Ans: d Explanation: Concurrency is the term used for the same. When several things are accessed simultaneously, the job is said to be concurrent.

4)

\_\_\_\_\_ leads to concurrency.

- a) Serialization b) Parallelism c) Serial processing d) Distribution

Ans: b Explanation: Parallelism leads naturally to Concurrency. For example, Several processes trying to print a file on a single printer.

5)

A parallelism based on increasing processor word size.

- a) Increasing b) Count based c) Bit based d) Bit level

Ans: d Explanation: Bit level parallelism is based on increasing processor word size. It focuses on hardware capabilities for structuring.

6)

The measure of the “effort” needed to maintain efficiency while adding processors.

- a) Maintainability b) Efficiency
- c) Scalability d) Effectiveness

Ans: C Explanation: The measure of the “effort” needed to maintain efficiency while adding processors is called as scalability.

7)

Several instructions execution simultaneously in \_\_\_\_\_

a) processing b) parallel processing c) serial processing d) multitasking

Ans: b Explanation: In parallel processing, the several instructions are executed simultaneously.

8)

Conventional architectures coarsely comprise of a\_

- a) A processor
- b) Memory system
- c) Data path.
- d) All of Above

Ans: d Explanation:

9) A pipeline is like\_

- a) Overlaps various stages of instruction execution to achieve performance.
- b) House pipeline
- c) Both a and b
- d) A gas line

Ans: a Explanation:

10) VLIW processors rely on\_

- a) Compile time analysis
- b) Initial time analysis
- c) Final time analysis
- d) Mid time analysis

Ans: a Explanation:

11)

Memory system performance is largely captured by\_

- a) Latency
- b) Bandwidth
- c) Both a and b
- d) none of above

Ans: c Explanation:

12)

The fraction of data references satisfied by the cache is called\_

- a) Cache hit ratio
- b) Cache fit ratio
- c) Cache best ratio
- d) none of above

Ans: a Explanation:

13)

A single control unit that dispatches the same Instruction to various processors is\_\_

- a) SIMD
- b) SPMD
- c) MIMD

d) None of above

Ans: a Explanation:

14)

The primary forms of data exchange between parallel tasks are\_

a) Accessing a shared data space

b) Exchanging messages.

c) Both A and B

d) None of Above Ans: c Explanation:

16)

Switches map a fixed number of inputs to outputs.

a) True

b) False

Ans: a Explanation:

## UNIT-2

1)

The First step in developing a parallel algorithm is\_

a) To Decompose the problem into tasks that can be executed concurrently

b) Execute directly

c) Execute indirectly

d) None of Above

Ans: a Explanation:

2)

The number of tasks into which a problem is decomposed determines its\_

a) Granularity

b) Priority

c) Modernity

d) None of above

Ans: A Explanation:

3)

The length of the longest path in a task dependency graph is called\_

a) the critical path length

b) the critical data length

c) the critical bit length

d) None of above

Ans: a Explanation:

4)

The graph of tasks (nodes) and their interactions/data exchange (edges)\_

a) Is referred to as a task interaction graph

b) Is referred to as a task Communication graph

- c) Is referred to as a task interface graph
- d) None of Above

Ans: a Explanation:

5)

Mappings are determined by\_

- a) task dependency
- b) task interaction graphs
- c) Both A and B
- d) None of Above

Ans: c Explanation:

6)

Decomposition Techniques are\_

- a) recursive decomposition
- b) data decomposition
- c) exploratory decomposition
- d) speculative decomposition
- e) All of Above

Ans: E Explanation:

7)

The Owner Computes Rule generally states that the process assigned a particular data item is responsible for\_

- a) All computation associated with it
- b) Only one computation
- c) Only two computation
- d) Only occasionally computation

Ans: A Explanation:

8)

A simple application of exploratory decomposition is\_

- a) The solution to a 15 puzzle
- b) The solution to 20 puzzle
- c) The solution to any puzzle
- d) None of Above

Ans: A Explanation:

9)

Speculative Decomposition consist of \_

- a) conservative approaches
- b) optimistic approaches
- c) Both A and B
- d) Only B

Ans: C Explanation:

10)

task characteristics include:

- a) Task generation.
- b) Task sizes.
- c) Size of data associated with tasks.
- d) All of Above

Ans: d Explanation: UNIT-3

1)

Group communication operations are built using point-to-point messaging primitives

- a) True
- b) False

Ans: A Explanation:

2)

Communicating a message of size m over an uncongested network takes time  $ts + tmw$

- a) True
- b) False

Ans: A Explanation:

3)

The dual of one-to-all broadcast is\_

- a) All-to-one reduction
- b) All-to-one receiver
- c) All-to-one Sum
- d) None of Above

Ans: A Explanation:

4)

A hypercube has\_

- a)  $2^d$  nodes
- b)  $2^d$  nodes
- c)  $2^n$  Nodes
- d) N Nodes

Ans: a Explanation:

5)

A binary tree in which processors are (logically) at the leaves and internal nodes are routing nodes.

- a) True
- b) False

Ans: A Explanation:

6)

In All-to-All Broadcast each processor is the source as well as destination.

- a) True

b) False

Ans: A Explanation:

7)

The Prefix Sum Operation can be implemented using the\_

- a) All-to-all broadcast kernel.
- b) All-to-one broadcast kernel.
- c) One-to-all broadcast Kernel
- d) Scatter Kernel

Ans: A Explanation:

8)

In the scatter operation\_

- a) Single node send a unique message of size m to every other node
- b) Single node send a same message of size m to every other node
- c) Single node send a unique message of size m to next node
- d) None of Above

Ans: A Explanation:

9)

The gather operation is exactly the inverse of the\_

- a) Scatter operation
- b) Broadcast operation
- c) Prefix Sum
- d) Reduction operation

Ans: A Explanation:

10)

In All-to-All Personalized Communication Each node has a distinct message of size m for every other node

- a) True
- b) False

Ans: a Explanation:

## UNIT-1

1) Conventional architectures coarsely comprise of a\_\_\_\_\_

- a) processor
- b) Memory system
- c) Datapath.
- d) All of Above

Ans: d

Explanation:

- 2) Data intensive applications utilize\_\_\_\_\_
- a) High aggregate throughput
  - b) High aggregate network bandwidth
  - c) High processing and memory system performance.
  - d) None of above

Ans: a

Explanation:

- 3) A pipeline is like\_\_\_\_\_
- a. Overlaps various stages of instruction execution to achieve performance.
  - b. House pipeline
  - c. Both a and b
  - d. gas line

Ans: a

Explanation:

- 4) Scheduling of instructions is determined \_\_\_\_\_
- a) True Data Dependency
  - b) Resource Dependency
  - c) Branch Dependency
  - d) All of above

Ans: d

Explanation:

- 5) VLIW processors rely on\_\_\_\_\_
- a) Compile time analysis
  - b) Initial time analysis
  - c) Final time analysis
  - d) Mid time analysis

Ans: a

Explanation:

- 6) Memory system performance is largely captured by\_\_\_\_\_
- a) Latency
  - b) Bandwidth
  - c) Both a and b
  - d) none of above

Ans: c

Explanation:

- 7) The fraction of data references satisfied by the cache is called\_\_\_\_\_
- a) Cache hit ratio

- b) Cache fit ratio
- c) Cache best ratio
- d) none of above

Ans: a

Explanation:

- 8) A single control unit that dispatches the same Instruction to various processors is\_\_
- a) SIMD
  - b) SPMD
  - c) MIMD
  - d) None of above

Ans: a

Explanation:

- 9) The primary forms of data exchange between parallel tasks are\_\_

- a. Accessing a shared data space
- b. Exchanging messages.
- c. Both A and B
- d. None of Above

Ans: c

Explanation:

- 10) Switches map a fixed number of inputs to outputs.
- a) True
  - b) False

Ans: a

Explanation:

- 11) The stage in which the CPU fetches the instructions from the instruction cache in superscalar organization is

- a) Prefetch stage
- b) D1 (first decode) stage
- c) D2 (second decode) stage
- d) Final stage

Ans: a

Explanation: In the prefetch stage of pipeline, the CPU fetches the instructions from the instruction cache, which stores the instructions to be executed. In this stage, CPU also aligns the codes appropriately.

- 12) The CPU decodes the instructions and generates control words in
- a) Prefetch stage
  - b) D1 (first decode) stage
  - c) D2 (second decode) stage
  - d) Final stage

Ans: b

Explanation: In D1 stage, the CPU decodes the instructions and generates control words. For simple RISC instructions, only single control word is enough for starting the execution.

- 13) The fifth stage of pipeline is also known as

- a) read back stage
- b) read forward stage
- c) write back stage
- d) none of the mentioned

Ans: c

Explanation: The fifth stage or final stage of pipeline is also known as “Write back (WB) stage”.

- 14) In the execution stage the function performed is
- a) CPU accesses data cache
  - b) executes arithmetic/logic computations
  - c) executes floating point operations in execution unit
  - d) all of the mentioned

Ans: d

Explanation: In the execution stage, known as E-stage, the CPU accesses data cache, executes arithmetic/logic computations, and floating point operations in execution unit.

- 15) The stage in which the CPU generates an address for data memory references in this stage is

- a) prefetch stage
- b) D1 (first decode) stage
- c) D2 (second decode) stage
- d) execution stage

Ans: c

Explanation: In the D2 (second decode) stage, CPU generates an address for data memory references in this stage. This stage is required where the control word from D1 stage is again decoded for final execution.

- 16) The feature of separated caches is

- a) supports the superscalar organization
- b) high bandwidth
- c) low hit ratio
- d) all of the mentioned

Ans: d

Explanation: The separated caches have low hit ratio compared to a unified cache, but have the advantage of supporting the superscalar organization and high bandwidth.

- 17) In the operand fetch stage, the FPU (Floating Point Unit) fetches the operands from
- a) floating point unit
  - b) instruction cache
  - c) floating point register file or data cache
  - d) floating point register file or instruction cache

Ans: C

Explanation: In the operand fetch stage, the FPU (Floating Point Unit) fetches the operands from either floating point register file or data cache.

- 18) The FPU (Floating Point Unit) writes the results to the floating point register file in
- a) X1 execution state
  - b) X2 execution state

- c) write back stage
- d) none of the mentioned

Ans: c

Explanation: In the two execution stages of X1 and X2, the floating point unit reads the data from the data cache and executes the floating point computation. In the “write back stage” of pipeline, the FPU (Floating Point Unit) writes the results to the floating point register file.

- 19) The floating point multiplier segment performs floating point multiplication in
- a) single precision
  - b) double precision
  - c) extended precision
  - d) all of the mentioned

Ans: d

Explanation: The floating point multiplier segment performs floating point multiplication in single precision, double precision and extended precision.

- 20) The instruction or segment that executes the floating point square root instructions is
- a) floating point square root segment
  - b) floating point division and square root segment
  - c) floating point divider segment
  - d) none of the mentioned

Ans: c

Explanation: The floating point divider segment executes the floating point division and square root instructions.

- 21) The floating point rounder segment performs rounding off operation at
- a) after write back stage
  - b) before write back stage
  - c) before arithmetic operations
  - d) none of the mentioned

Ans: b

Explanation: The results of floating point addition or division process may be required to be rounded off, before write back stage to the floating point registers.

- 21) Which of the following is a floating point exception that is generated in case of integer arithmetic?

- a) divide by zero
- b) overflow
- c) denormal operand
- d) all of the mentioned

Ans: D

Explanation: In the case of integer arithmetic, the possible floating point exceptions in Pentium are:

1. divide by zero

- 2. overflow
- 3. denormal operand
- 4. underflow
- 5. invalid operation.

1. The First step in developing a parallel algorithm is\_

**E. To Decompose the problem into tasks that can be executed concurrently**

- F. Execute directly
- G. Execute indirectly
- H. None of Above

2. The number of tasks into which a problem is decomposed determines its\_

**E. Granularity**

- F. Priority
- G. Modernity
- H. None of above

3. The length of the longest path in a task dependency graph is called\_

- F. the critical path length**
- G. the critical data length
  - H. the critical bit length
  - I. None of above

4. The graph of tasks (nodes) and their interactions/data exchange (edges)\_

- E. Is referred to as a *task interaction graph***
- F. Is referred to as a *task Communication graph*
  - G. Is referred to as a *task interface graph*
  - H. None of Above

5. Mappings are determined by\_

- E. task dependency**
- F. task interaction graphs**
- G. Both A and B**
- H. None of Above**

6. Decomposition Techniques are\_

- F. recursive decomposition
- G. data decomposition
- H. exploratory decomposition
- I. speculative decomposition
- J. All of Above**

7. The *Owner Computes Rule* generally states that the process assigned a particular data item is responsible for\_
- E. All computation associated with it  
F. Only one computation  
G. Only two computation  
H. Only occasionally computation
8. A simple application of exploratory decomposition is\_
- E. The solution to a 15 puzzle**  
F. The solution to 20 puzzle  
G. The solution to any puzzle  
H. None of Above
9. Speculative Decomposition consist of\_
- E. conservative approaches  
F. optimistic approaches  
**G. Both A and B**  
H. Only B
10. task characteristics include:  
E. Task generation.  
F. Task sizes.  
G. Size of data associated with tasks.  
**H. All of Above**
11. Choose the most accurate (**CORRECT**) statement:
- a. **Scalability is a measure of the capacity to increase speedup in proportion to the number of processors**  
b. Efficiency is the ratio of the serial run time of the best sequential algorithm for solving a problem to the time taken by the parallel algorithm to solve the same problem on  $p$  processors  
c. Run time is the time that elapses from the moment a parallel computation starts to the moment the last processor finishes.  
d. Superlinear is the fraction of time for which a processor is usefully employed
12. Parallelism can be used to increase the (parallel) size of the problem is applicable in \_\_\_\_\_.
- a. Amdahl's Law  
**b. Gustafson-Barsis's Law**  
c. Newton's Law  
d. Pascal's Law

13. \_\_\_\_\_ is due to load imbalance, synchronization, or serial components as parts of overheads in parallel programs.
- a. Interprocess interaction
  - b. Synchronization
  - c. Idling**
  - d. Excess computation
14. Which of the following parallel methodological design elements focuses on recognizing opportunities for parallel execution?
- a. Partitioning**
  - b. Communication
  - c. Agglomeration
  - d. Mapping
15. Considering to use weak or strong scaling is part of \_\_\_\_\_ in addressing the challenges of distributed memory programming.
- a. Splitting the problem
  - b. Speeding up computations**
  - c. Speeding up communication
  - d. Speeding up hardware
16. Domain and functional decomposition are considered in the following parallel methodological design elements, EXCEPT:
- a. Partitioning
  - b. Communication
  - c. Agglomeration**
  - d. Mapping
17. Synchronization is one of the common issues in parallel programming. The issues related to synchronization include the followings, EXCEPT:
- a. Deadlock
  - b. Livelock
  - c. Fairness
  - d. Correctness**
18. Which of the followings is the **BEST** description of Message Passing Interface (MPI)?
- a. A specification of a shared memory library
  - b. MPI uses objects called communicators and groups to define which collection of processes may communicate with each other**
  - c. Only communicators and not groups are accessible to the programmer only by a "handle"
  - d. A communicator is an ordered set of processes

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SET 7 MCQs

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Which is alternative options for latency hiding?

- A. Increase CPU frequency
- B. Multithreading
- C. Increase Bandwidth

D. Increase Memory

ANSWER: B

\_\_\_\_\_ Communication model is generally seen in tightly coupled system.

- A. Message Passing
- B. Shared-address space
- C. Client-Server
- D. Distributed Network

ANSWER: B

The principal parameters that determine the communication latency are as follows:

- A. Startup time (ts) Per-hop time (th) Per-word transfer time (tw)
- B. Startup time (ts) Per-word transfer time (tw)
- C. Startup time (ts) Per-hop time (th)
- D. Startup time (ts) Message-Packet-Size(W)

ANSWER: A

The number and size of tasks into which a problem is decomposed determines the \_\_

- A. Granularity
- B. Task
- C. Dependency Graph
- D. Decomposition

ANSWER: A

Average Degree of Concurrency is...

- A. The average number of tasks that can run concurrently over the entire duration of execution of the process.
- B. The average time that can run concurrently over the entire duration of execution of the process.
- C. The average in degree of task dependency graph.
- D. The average out degree of task dependency graph.

ANSWER: A

Which task decomposition technique is suitable for the 15-puzzle problem?

- A. Data decomposition
- B. Exploratory decomposition
- C. Speculative decomposition
- D. Recursive decomposition

ANSWER: B

Which of the following method is used to avoid Interaction Overheads?

- A. Maximizing data locality
- B. Minimizing data locality
- C. Increase memory size
- D. None of the above.

ANSWER: A

Which of the following is not parallel algorithm model

- A. The Data Parallel Model
- B. The work pool model
- C. The task graph model
- D. The Speculative Model

ANSWER: D

Nvidia GPU based on following architecture

- A. MIMD
- B. SIMD
- C. SISD
- D. MISD

ANSWER: B

What is Critical Path?

- A. The length of the longest path in a task dependency graph is called the critical path length.
- B. The length of the smallest path in a task dependency graph is called the critical path length.
- C. Path with loop
- D. None of the mentioned.

ANSWER: A

Which decomposition technique uses divide-and-conquer strategy?

- A. recursive decomposition
- B. Sdata decomposition
- C. exploratory decomposition
- D. speculative decomposition

ANSWER: A

If there are 6 nodes in a ring topology how many message passing cycles will be required to complete broadcast process in one to all?

- A. 1
- B. 6
- C. 3
- D. 4

ANSWER: 3

If there is 4 X 4 Mesh topology network then how many ring operation will perform to complete one to all broadcast?

- A. 4
- B. 8
- C. 16
- D. 32

ANSWER: 8

Consider all to all broadcast in ring topology with 8 nodes. How many messages will be present with each node after 3rd step/cycle of communication?

- A. 3
- B. 4
- C. 6
- D. 7

**ANSWER: 4**

Consider Hypercube topology with 8 nodes then how many message passing cycles will require in all to all broadcast operation?

- A. The longest path between any pair of finish nodes.
- B. The longest directed path between any pair of start & finish node.
- C. The shortest path between any pair of finish nodes.
- D. The number of maximum nodes level in graph.

**ANSWER: D**

Scatter is \_\_\_\_\_.

- A. One to all broadcast communication
- B. All to all broadcast communication
- C. One to all personalised communication
- D. Node of the above.

**ANSWER: C**

If there is 4X4 Mesh Topology \_\_\_\_\_ message passing cycles will require complete all to all reduction.

- A. 4
- B. 6
- C. 8
- D. 16

**ANSWER: C**

Following issue(s) is/are the true about sorting techniques with parallel computing.

- A. Large sequence is the issue
- B. Where to store output sequence is the issue
- C. Small sequence is the issue
- D. None of the above

**ANSWER: B**

Partitioning on series done after \_\_\_\_\_

- A. Local arrangement
- B. Processess assignments
- C. Global arrangement
- D. None of the above

**ANSWER: C**

In Parallel DFS processes has following roles.(Select multiple choices if applicable)

- A. Donor
- B. Active
- C. Idle
- D. Passive

**ANSWER: A**

Suppose there are 16 elements in a series then how many phases will be required to sort the series using parallel odd-even bubble sort?

- A. 8
- B. 4

C. 5

D. 15

ANSWER: D

Which are different sources of Overheads in Parallel Programs?

- A. Interprocess interactions
- B. Process Idling
- C. All mentioned options
- D. Excess Computation

ANSWER: C

The ratio of the time taken to solve a problem on a parallel processors to the time required to solve the same problem on a single processor with p identical processing elements.

- A. The ratio of the time taken to solve a problem on a single processor to the time required to solve the same problem on a parallel computer with p identical processing elements.
- B. The ratio of the time taken to solve a problem on a single processor to the time required to solve the same problem on a parallel computer with p identical processing elements
- C. The ratio of number of multiple processors to size of data
- D. None of the above

ANSWER: B

Efficiency is a measure of the fraction of time for which a processing element is usefully employed.

- A. TRUE
- B. FALSE

ANSWER: A

CUDA helps do execute code in parallel mode using \_\_\_\_\_

- A. CPU
- B. GPU
- C. ROM
- D. Cash memory

ANSWER: B

In thread-function execution scenario thread is a \_\_\_\_\_

- A. Work
- B. Worker
- C. Task
- D. None of the above

ANSWER: B

In GPU Following statements are true

- A. Grid contains Block
- B. Block contains Threads
- C. All the mentioned options.
- D. SM stands for Streaming MultiProcessor

ANSWER: C

Computer system of a parallel computer is capable of\_\_\_\_\_

- A. Decentralized computing

- B. Parallel computing
- C. Centralized computing
- D. All of these

ANSWER: A

In which application system Distributed systems can run well?

- A. HPC
- B. Distributed Framework
- C. HRC
- D. None of the above

ANSWER: A

A pipeline is like ..... ?

- A. an automobile assembly line
- B. house pipeline
- C. both a and b
- D. a gas line

ANSWER: A

Pipeline implements ?

- A. fetch instruction
- B. decode instruction
- C. fetch operand
- D. all of above

ANSWER: D

A processor performing fetch or decoding of different instruction during the execution of another instruction is called \_\_\_\_\_ ?

- A. Super-scaling
- B. Pipe-lining
- C. Parallel Computation
- D. None of these

ANSWER: B

In a parallel execution, the performance will always improve as the number of processors will increase?

- A. True
- B. False

ANSWER: B

VLIW stands for ?

- A. Very Long Instruction Word
- B. Very Long Instruction Width
- C. Very Large Instruction Word
- D. Very Long Instruction Width

ANSWER: A

In VLIW the decision for the order of execution of the instructions depends on the program itself?

- A. True
- B. False

ANSWER: A

Which one is not a limitation of a distributed memory parallel

system?

- A. Higher communication time
- B. Cache coherency
- C. Synchronization overheads
- D. None of the above

ANSWER: B

Which of these steps can create conflict among the processors?

- A. Synchronized computation of local variables
- B. Concurrent write
- C. Concurrent read
- D. None of the above

ANSWER: B

Which one is not a characteristic of NUMA multiprocessors?

- A. It allows shared memory computing
- B. Memory units are placed in physically different location
- C. All memory units are mapped to one common virtual global memory
- D. Processors access their independent local memories

ANSWER: D

Which of these is not a source of overhead in parallel computing?

- A. Non-uniform load distribution
- B. Less local memory requirement in distributed computing
- C. Synchronization among threads in shared memory computing
- D. None of the above

ANSWER: B

Systems that do not have parallel processing capabilities are?

- A. SISD
- B. SIMD
- C. MIMD
- D. All of the above

ANSWER: A

How does the number of transistors per chip increase according to Moore's law?

- A. Quadratically
- B. Linearly
- C. Cubically
- D. Exponentially

ANSWER: D

Parallel processing may occur?

- A. in the instruction stream
- B. in the data stream
- C. both[A] and [B]
- D. none of the above

ANSWER: C

To which class of systems does the von Neumann computer belong?

- A. SIMD (Single Instruction Multiple Data)
- B. MIMD (Multiple Instruction Multiple Data)

- C. MISD (Multiple Instruction Single Data)
- D. SISD (Single Instruction Single Data)

ANSWER: D

Fine-grain threading is considered as a \_\_\_\_\_ threading?

- A. Instruction-level
- B. Loop level
- C. Task-level
- D. Function-level

ANSWER: A

Multiprocessor is systems with multiple CPUs, which are capable of independently executing different tasks in parallel. In this category every processor and memory module has similar access time?

- A. UMA
- B. Microprocessor
- C. Multiprocessor
- D. NUMA

ANSWER: A

For inter processor communication the miss arises are called?

- A. hit rate
- B. coherence misses
- C. comitt misses
- D. parallel processing

ANSWER: B

NUMA architecture uses \_\_\_\_\_ in design?

- A. cache
- B. shared memory
- C. message passing
- D. distributed memory

ANSWER: D

A multiprocessor machine which is capable of executing multiple instructions on multiple data sets?

- A. SISD
- B. SIMD
- C. MIMD
- D. MISD

ANSWER: C

In message passing, send and receive message between?

- A. Task or processes
- B. Task and Execution
- C. Processor and Instruction
- D. Instruction and decode

ANSWER: A

The First step in developing a parallel algorithm is\_\_\_\_\_?

- A. To Decompose the problem into tasks that can be executed concurrently
- B. Execute directly

C. Execute indirectly

D. None of Above

ANSWER: A

The number of tasks into which a problem is decomposed determines its?

A. Granularity

B. Priority

C. Modernity

D. None of above

ANSWER: A

The length of the longest path in a task dependency graph is called?

A. the critical path length

B. the critical data length

C. the critical bit length

D. None of above

ANSWER: A

The graph of tasks (nodes) and their interactions/data exchange

(edges)?

A. Is referred to as a task interaction graph

B. Is referred to as a task Communication graph

C. Is referred to as a task interface graph

D. None of Above

ANSWER: A

Mappings are determined by?

A. task dependency

B. task interaction graphs

C. Both A and B

D. None of Above

ANSWER: C

Decomposition Techniques are?

A. recursive decomposition

B. data decomposition

C. exploratory decomposition

D. All of Above

ANSWER: D

The Owner Computes Rule generally states that the process assigned a particular data item is responsible for?

A. All computation associated with it

B. Only one computation

C. Only two computation

D. Only occasionally computation

ANSWER: A

A simple application of exploratory decomposition is\_?

A. The solution to a 15 puzzle

B. The solution to 20 puzzle

C. The solution to any puzzle

D. None of Above

ANSWER: A

Speculative Decomposition consist of \_?

A. conservative approaches

B. optimistic approaches

C. Both A and B

D. Only B

ANSWER: C

task characteristics include?

A. Task generation.

B. Task sizes.

C. Size of data associated with tasks.

D. All of Above

ANSWER: D

Writing parallel programs is referred to as?

A. Parallel computation

B. Parallel processes

C. Parallel development

D. Parallel programming

ANSWER: D

Parallel Algorithm Models?

A. Data parallel model

B. Bit model

C. Data model

D. network model

ANSWER: A

The number and size of tasks into which a problem is decomposed determines the?

A. fine-granularity

B. coarse-granularity

C. sub Task

D. granularity

ANSWER: A

A feature of a task-dependency graph that determines the average degree of concurrency for a given granularity is its \_\_\_\_\_ path?

A. critical

B. easy

C. difficult

D. ambiguous

ANSWER: A

The pattern of \_\_\_\_\_ among tasks is captured by what is known as a task-interaction graph?

A. Interaction

B. communication

C. optimization

D. flow

ANSWER: A

Interaction overheads can be minimized by \_\_\_\_?

- A. Maximize Data Locality
- B. Maximize Volume of data exchange
- C. Increase Bandwidth
- D. Minimize social media contents

ANSWER: A

Type of parallelism that is naturally expressed by independent tasks in a task-dependency graph is called \_\_\_\_\_ parallelism?

- A. Task
- B. Instruction
- C. Data
- D. Program

ANSWER: A

Speed up is defined as a ratio of?

- A.  $s = T_s/T_p$
- B.  $S = T_p/T_s$
- C.  $T_s = S/T_p$
- D.  $T_p = S/T_s$

ANSWER: A

Parallel computing means to divide the job into several \_\_\_\_\_?

- A. Bit
- B. Data
- C. Instruction
- D. Task

ANSWER: D

\_\_\_\_\_ is a method for inducing concurrency in problems that can be solved using the divide-and-conquer strategy?

- A. exploratory decomposition
- B. speculative decomposition
- C. data-decomposition
- D. Recursive decomposition

ANSWER: C

The\_\_\_\_ time collectively spent by all the processing elements  $T_{all} = p T_p$ ?

- A. total
- B. Average
- C. mean
- D. sum

ANSWER: A

Group communication operations are built using point-to-point messaging primitives?

- A. True
- B. False

ANSWER: A

Communicating a message of size  $m$  over an uncongested network takes time  $ts + tmw$ ?

- A. True
- B. False

ANSWER: A

The dual of one-to-all broadcast is ?

- A. All-to-one reduction
- B. All-to-one receiver
- C. All-to-one Sum
- D. None of Above

ANSWER: A

A hypercube has?

- A.  $2d$  nodes
- B.  $2d$  nodes
- C.  $2n$  Nodes
- D.  $N$  Nodes

ANSWER: A

A binary tree in which processors are (logically) at the leaves and internal nodes are routing nodes?

- A. True
- B. False

ANSWER: A

In All-to-All Broadcast each processor is the source as well as destination?

- A. True
- B. False

ANSWER: A

The Prefix Sum Operation can be implemented using the ?

- A. All-to-all broadcast kernel.
- B. All-to-one broadcast kernel.
- C. One-to-all broadcast Kernel
- D. Scatter Kernel

ANSWER: A

In the scatter operation ?

- A. Single node send a unique message of size  $m$  to every other node
- B. Single node send a same message of size  $m$  to every other node
- C. Single node send a unique message of size  $m$  to next node
- D. None of Above

ANSWER: A

The gather operation is exactly the inverse of the ?

- A. Scatter operation
- B. Broadcast operation
- C. Prefix Sum
- D. Reduction operation

ANSWER: A

In All-to-All Personalized Communication Each node has a distinct

message of size m for every other node ?

- A. True
- B. False

ANSWER: A

Parallel algorithms often require a single process to send identical data to all other processes or to a subset of them. This operation is known as \_\_\_\_\_?

- A. one-to-all broadcast
- B. All to one broadcast
- C. one-to-all reduction
- D. all to one reduction

ANSWER: A

In which of the following operation, a single node sends a unique message of size m to every other node?

- A. Gather
- B. Scatter
- C. One to all personalized communication
- D. Both A and C

ANSWER: D

Gather operation is also known as \_\_\_\_\_?

- A. One to all personalized communication
- B. One to all broadcast
- C. All to one reduction
- D. All to All broadcast

ANSWER: A

one-to-all personalized communication does not involve any duplication of data?

- A. True
- B. False

ANSWER: A

Gather operation, or concatenation, in which a single node collects a unique message from each node?

- A. True
- B. False

ANSWER: A

Conventional architectures coarsely comprise of a?

- A. A processor
- B. Memory system
- C. Data path.
- D. All of Above

ANSWER: D

Data intensive applications utilize?

- A. High aggregate throughput
- B. High aggregate network bandwidth
- C. High processing and memory system performance.
- D. None of above

**ANSWER: A**

A pipeline is like?

- A. Overlaps various stages of instruction execution to achieve performance.
- B. House pipeline
- C. Both a and b
- D. A gas line

**ANSWER: A**

Scheduling of instructions is determined?

- A. True Data Dependency
- B. Resource Dependency
- C. Branch Dependency
- D. All of above

**ANSWER: D**

VLIW processors rely on?

- A. Compile time analysis
- B. Initial time analysis
- C. Final time analysis
- D. Mid time analysis

**ANSWER: A**

Memory system performance is largely captured by?

- A. Latency
- B. Bandwidth
- C. Both a and b
- D. none of above

**ANSWER: C**

The fraction of data references satisfied by the cache is called?

- A. Cache hit ratio
- B. Cache fit ratio
- C. Cache best ratio
- D. none of above

**ANSWER: A**

A single control unit that dispatches the same Instruction to various processors is?

- A. SIMD
- B. SPMD
- C. MIMD
- D. None of above

**ANSWER: A**

The primary forms of data exchange between parallel tasks are?

- A. Accessing a shared data space
- B. Exchanging messages.
- C. Both A and B
- D. None of Above

**ANSWER: C**

Switches map a fixed number of inputs to outputs?

A. True

B. False

ANSWER: A

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C. Prefix Sum

D. Reduction operation

ANSWER: A

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A. True

B. False

ANSWER: A

Computer system of a parallel computer is capable of?

A. Decentralized computing

B. Parallel computing

C. Centralized computing

D. Decentralized computing

E. Distributed computing

ANSWER: A

Writing parallel programs is referred to as?

A. Parallel computation

B. Parallel processes

C. Parallel development

D. Parallel programming

ANSWER: D

Simplifies applications of three-tier architecture is \_\_\_\_\_?

A. Maintenance

B. Initiation

C. Implementation

D. Deployment

ANSWER: D

Dynamic networks of networks, is a dynamic connection that grows is called?

A. Multithreading

B. Cyber cycle

C. Internet of things

D. Cyber-physical system

ANSWER: C

In which application system Distributed systems can run well?

A. HPC

D. HTC

C. HRC

D. Both A and B

ANSWER: D

In which systems desire HPC and HTC?

A. Adaptivity

B. Transparency

C. Dependency

D. Secretive

ANSWER: B

No special machines manage the network of architecture in which resources are known as?

A. Peer-to-Peer

B. Space based

C. Tightly coupled

D. Loosely coupled

ANSWER: A

Significant characteristics of Distributed systems have of ?

A. 5 types

B. 2 types

C. 3 types

D. 4 types

ANSWER: C

Built of Peer machines are over?

A. Many Server machines

B. 1 Server machine

C. 1 Client machine

D. Many Client machines

ANSWER: D

Type HTC applications are?

A. Business

B. Engineering

C. Science

D. Media mass

**ANSWER: A**

Virtualization that creates one single address space architecture that of, is called?

- A. Loosely coupled
- B. Peer-to-Peer
- C. Space-based
- D. Tightly coupled

**ANSWER: C**

We have an internet cloud of resources In cloud computing to form?

- A. Centralized computing
- B. Decentralized computing
- C. Parallel computing
- D. All of these

**ANSWER: D**

Data access and storage are elements of Job throughput, of

\_\_\_\_\_?

- A. Flexibility
- B. Adaptation
- C. Efficiency
- D. Dependability

**ANSWER: C**

Billions of job requests is over massive data sets, ability to support known as?

- A. Efficiency
- B. Dependability
- C. Adaptation
- D. Flexibility

**ANSWER: C**

Broader concept offers Cloud computing .to select which of the following?

- A. Parallel computing
- B. Centralized computing
- C. Utility computing
- D. Decentralized computing

**ANSWER: C**

Resources and clients transparency that allows movement within a system is called?

- A. Mobility transparency
- B. Concurrency transparency
- C. Performance transparency
- D. Replication transparency

**ANSWER: A**

Distributed program in a distributed computer running a is known as?

- A. Distributed process
- B. Distributed program
- C. Distributed application

D. Distributed computing

ANSWER: B

Uniprocessor computing devices is called\_\_\_\_\_?

- A. Grid computing
- B. Centralized computing
- C. Parallel computing
- D. Distributed computing

ANSWER: B

Utility computing focuses on a\_\_\_\_\_ model?

- A. Data
- B. Cloud
- C. Scalable
- D. Business

ANSWER: D

What is a CPS merges technologies?

- A. 5C
- B. 2C
- C. 3C
- D. 4C

ANSWER: C

Aberration of HPC?

- A. High-peak computing
- B. High-peripheral computing
- C. High-performance computing
- D. Highly-parallel computing

ANSWER: C

Peer-to-Peer leads to the development of technologies like?

- A. Norming grids
- B. Data grids
- C. Computational grids
- D. Both A and B

ANSWER: D

Type of HPC applications of?

- A. Management
- B. Media mass
- C. Business
- D. Science

ANSWER: D

The development generations of Computer technology has gone through?

- A. 6
- B. 3
- C. 4
- D. 5

ANSWER: D

Utilization rate of resources in an execution model is known to be its?

- A. Adaptation
- B. Efficiency
- C. Dependability
- D. Flexibility

ANSWER: B

Even under failure conditions Providing Quality of Service (QoS) assurance is the responsibility of?

- A. Dependability
- B. Adaptation
- C. Flexibility
- D. Efficiency

ANSWER: A

Interprocessor communication that takes place?

- A. Centralized memory
- B. Shared memory
- C. Message passing
- D. Both A and B

ANSWER: D

Data centers and centralized computing covers many and?

- A. Microcomputers
- B. Minicomputers
- C. Mainframe computers
- D. Supercomputers

ANSWER: D

Which of the following is an primary goal of HTC paradigm\_\_\_\_\_?

- A. High ratio Identification
- B. Low-flux computing
- C. High-flux computing
- D. Computer utilities

ANSWER: C

The high-throughput service provided is measures taken by

- A. Flexibility
- B. Efficiency
- C. Dependability
- D. Adaptation

ANSWER: D

What are the sources of overhead?

- A. Essential /Excess Computation
- B. Inter-process Communication
- C. Idling
- D. All above

ANSWER: D

Which are the performance metrics for parallel systems?

- A. Execution Time
- B. Total Parallel Overhead

C. Speedup

D. All above

ANSWER: D

The efficiency of a parallel program can be written as:  $E = Ts / pTp$ . True or False?

A. True

B. False

ANSWER: A

The important feature of the VLIW is \_\_\_\_\_?

A. ILP

B. Performance

C. Cost effectiveness

D. delay

ANSWER: A

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### SET 8 (MCQs)

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No.	Question	1	2	3	4	Ans
1	Any condition that causes a processor to stall is called as ____.	Hazard	Page fault	System error	None of the above	1
2	The time lost due to branch instruction is often referred to as ____.	Latency	Delay	Branch penalty	None of the above	3
3	____ method is used in centralized systems to perform out of order execution.	Scorecard	Score boarding	Optimizing	Redundancy	2
4	The computer cluster architecture emerged as an alternative for ____.	ISA	Workstation	Super computers	Distributed systems	3
5	NVIDIA CUDA Warp is made up of how many threads?	512	1024	312	32	4
6	Out-of-order instructions is not possible on GPUs.	TRUE	FALSE	--	--	2
7	CUDA supports programming in ....	C or C++ only	Java, Python, and more	C, C++, third party wrappers for Java, Python, and more	Pascal	3
8	FADD, FMAD, FMIN, FMAX are ----- supported by Scalar Processors of NVIDIA GPU.	32-bit IEEE floating point instructions	32-bit integer instructions	both	none of the above	1
9	Each streaming multiprocessor (SM) of CUDA hardware has ----- scalar processors (SP).	1024	128	512	8	4
10	Each NVIDIA GPU has ----- Streaming Multiprocessors	8	1024	512	16	4
11	CUDA provides ----- warp and thread scheduling. Also, the overhead of thread creation is on the order of ----.	"programming-overhead", 2 clock	"zero-overhead", 1 clock	64, 2 clock	32, 1 clock	2
12	Each warp of GPU receives a single instruction and "broadcasts" it to all of its threads. It is a ---- operation.	SIMD (Single instruction multiple data)	SIMT (Single instruction multiple thread)	SISD (Single instruction single data)	SIST (Single instruction single thread)	2

<b>13</b>	Limitations of CUDA Kernel	recursion, call stack, static variable declaration	No recursion, no call stack, no static variable declarations	recursion, no call stack, static variable declaration	No recursion, call stack, no static variable declarations	<b>2</b>
<b>14</b>	What is Unified Virtual Machine	It is a technique that allow both CPU and GPU to read from single virtual machine, simultaneously .	It is a technique for managing separate host and device memory spaces.	It is a technique for executing device code on host and host code on device.	It is a technique for executing general purpose programs on device instead of host.	<b>1</b>
<b>15</b>	_____ became the first language specifically designed by a GPU Company to facilitate general purpose computing on _____.	Python, GPUs.	C, CPUs.	CUDA C, GPUs.	Java, CPUs.	<b>3</b>
<b>16</b>	The CUDA architecture consists of ----- for parallel computing kernels and functions.	RISC instruction set architecture	CISC instruction set architecture	ZISC instruction set architecture	PTX instruction set architecture	<b>4</b>
<b>17</b>	CUDA stands for -----, designed by NVIDIA.	Common Union Discrete Architecture	Complex Unidentified Device Architecture	Compute Unified Device Architecture	Complex Unstructured Distributed Architecture	<b>3</b>
<b>18</b>	The host processor spawns multithread tasks (or kernels as they are known in CUDA) onto the GPU device. State true or false.	TRUE	FALSE	---	---	<b>1</b>
<b>19</b>	The NVIDIA G80 is a ---- CUDA core device, the NVIDIA G200 is a ---- CUDA core device, and the NVIDIA Fermi is a ---- CUDA core device.	128, 256, 512	32, 64, 128	64, 128, 256	256, 512, 1024	<b>1</b>
<b>20</b>	NVIDIA 8-series GPUs offer ----- .	50-200 GFLOPS	200-400 GFLOPS	400-800 GFLOPS	800-1000 GFLOPS	<b>1</b>

21	IADD, IMUL24, IMAD24, IMIN, IMAX are ----- supported by Scalar Processors of NVIDIA GPU.	32-bit IEEE floating point instructions	32-bit integer instructions	both	none of the above	2
22	CUDA Hardware programming model supports: a) fully generally data-parallel architecture; b) General thread launch; c) Global load-store; d) Parallel data cache; e) Scalar architecture; f) Integers, bit operation	a,c,d,f	b,c,d,e	a,d,e,f	a,b,c,d,e,f	4
23	In CUDA memory model there are following memory types available: a) Registers; b) Local Memory; c) Shared Memory; d) Global Memory; e) Constant Memory; f) Texture Memory.	a, b, d, f	a, c, d, e, f	a, b, c, d, e, f	b, c, e, f	3
24	What is the equivalent of general C program with CUDA C: int main(void){ printf("Hello, World!\n"); return 0; }	int main( void ) { kernel <<<1,1>>>(); printf("Hello, World!\n"); return 0; }	__global__ void kernel( void ) {} int main ( void ){ kernel <<<1,1>>>(); printf("Hello, World!\n"); return 0; }	__global__ void kernel( void ){ kernel <<<1,1>>>(); printf("Hello, World!\n"); return 0; }	__global__ int main ( void ) { kernel <<<1,1>>>(); printf("Hello, World!\n"); return 0; }	2
25	Which function runs on Device (i.e. GPU): a) __global__ void kernel (void ){} b) int main ( void ) { ... return 0; }	a	b	both a,b	---	1
26	A simple kernel for adding two integers: __global__ void add( int *a, int *b, int *c ) { *c = *a + *b; } where __global__ is a CUDA C keyword which indicates that:	add() will execute on device, add() will be called from host	add() will execute on host, add() will be called from device	add() will be called and executed on host	add() will be called and executed on device	1
27	If variable a is host variable and dev_a is a device (GPU) variable, to allocate memory to dev_a select correct statement:	cudaMalloc( &dev_a, sizeof(int) )	malloc( &dev_a, sizeof(int) )	cudaMalloc( (void**) &dev_a, sizeof(int) )	malloc( (void**) &dev_a, sizeof(int) )	3

28	If variable a is host variable and dev_a is a device (GPU) variable, to copy input from variable a to variable dev_a select correct statement:	<code>memcpy( dev_a, &amp;a, size);</code>	<code>cudaMemcpy( dev_a, &amp;a, size, cudaMemcpyHostToDevice );</code>	<code>memcpy( (void*) dev_a, &amp;a, size);</code>	<code>cudaMemcpy( (void*) &amp;dev_a, &amp;a, size, cudaMemcpyDeviceToHost );</code>	2
29	Triple angle brackets mark in a statement inside main function, what does it indicates?	a call from host code to device code	a call from device code to host code	less than comparison	greater than comparison	1
30	What makes a CUDA code runs in parallel	<code>__global__</code> indicates parallel execution of code	main() function indicates parallel execution of code	Kernel name outside triple angle bracket indicates execution of kernel N times in parallel	first parameter value inside triple angle bracket (N) indicates execution of kernel N times in parallel	4
31	<b>Item Text</b>	1	2	3	4	<b>Ans</b>
32	Which of the following statements is <b>NOT TRUE</b> for Internal Sorting algorithms	Usually deal with small number of elements	No of elements must be able to fit in process's main memory	Use auxilliary memory like tape or hard disk	Ususally are of type compare-exchange	3
33						
34	In sorting networks for INCREASING COMPARATOR with input x,y select the correct output X', Y' from the following options	$X' = \min\{x, y\}$ and $Y' = \min\{x, y\}$	$X' = \max\{x, y\}$ and $Y' = \min\{x, y\}$	$X' = \min\{x, y\}$ and $Y' = \max\{x, y\}$	$X' = \max\{x, y\}$ and $Y' = \max\{x, y\}$	3
35						
36	In sorting networks for DECREASING COMPARATOR with input x,y select the correct output X', Y' from the following options	$X' = \min\{x, y\}$ and $Y' = \min\{x, y\}$	$X' = \max\{x, y\}$ and $Y' = \min\{x, y\}$	$X' = \min\{x, y\}$ and $Y' = \max\{x, y\}$	$X' = \max\{x, y\}$ and $Y' = \max\{x, y\}$	2
37						
38	Which of the following is <b>TRUE</b> for <b>Bitonic Sequence</b> a) Monotonically increasing b) Monotonically Decreasing c) With cyclic shift of indices d) First increasing then decreasing	a) and b)	a) and b) and d)	a) and b) and c)	a) and b) and c) and d)	4

39						
40	Which of the following is <b>NOT</b> a BITONIC Sequence	{8, 6, 4, 2, 3, 5, 7, 9}	{0, 4, 8, 9, 2, 1}	{3, 5, 7, 9, 8, 6, 4, 2}	{1, 2, 4, 7, 6, 0, 1}	4
41						
42	The procedure of sorting a bitonic sequence using bitonic splits is called	Bitonic Merge	Bitonic Split	Bitonic Divide	Bitonic Series	1
43						
44	While mapping Bitonic sort on Hypercube, Compare-exchange operations take place between wires whose labels differ in	One Bit	Two bits	Three Bits	Four bits	1
45						
46	Which of following is <b>NOT</b> A WAY of mapping the input wires of the bitonic sorting network to a MESH of processes	Row Major Mapping	Column Major Mapping	Row Major Snakelike mapping	Row Major Shuffled Mapping	2
47						
48	Which is the sorting algorithm in below given steps - 1. procedure X_SORT(n) 2. begin 3. for i := n - 1 downto 1 do 4. for j := 1 to i do 5. compare-exchange(aj, aj + 1); 6. end X_SORT	Selection Sort	Bubble Sort	Parallel Selection Sort	Parallel Bubble Sort	2
49						
50	The <b>odd-even transposition</b> algorithm sorts n elements in n phases (n is even), each of which requires ----- compare-exchange operations	2n	$n^2$	n/2	n	3
51						

52	What is TRUE about SHELL SORT	Moves elements only one position at a time	Moves elements long distance	During second phase algorithm switches to odd even transposition sort	both 2 and 3	4
53						
54	Which is the fastest sorting algorithm	Bubble Sort	Odd-Even Transposition Sort	Shell Sort	Quick Sort	4
55						
56	Quicksort's performance is greatly affected by the way it partitions a sequence.	TRUE	FALSE			1
57						
58	Pivot in Quick sort can be selected as	Always First Element	Always Last element	Always Middle index Element	Randomly Selected Element	4
59						
60	Quick sort uses Recursive Decomposition	TRUE	FALSE			1
61						
62	In first step of parallelizing quick sort for n elements to get subarrays, which of the following statement is TRUE	Only one process is used	n processes are used	two processes are used	None of the above	1
63						
64	In Binary tree representation created by execution of Quick sort, Pivot is at	Leaf Node	Root of tree	Any internal node	None of the above	2
65						
66	What is the worst case time complexity of a quick sort algorithm?	$O(N)$	$O(N \log N)$	$O(N^2)$	$O(\log N)$	3
67						
68	What is the average running time of a quick sort algorithm?	$O(N)$	$O(N \log N)$	$O(N^2)$	$O(\log N)$	2
69						
70	Odd-even transposition sort is a variation of	Quick Sort	Shell Sort	Bubble Sort	Selection Sort	3
71						

72	What is the average case time complexity of odd-even transposition sort?	$O(N \log N)$	$O(N)$	$O(\log N)$	$O(N^2)$	4
73						
74	Shell sort is an improvement on	Quick Sort	Bubble Sort	Insertion sort	Selection Sort	3
75						
76	In parallel Quick Sort Pivot is sent to processes by	Broadcast	Multicast	Selective Multicast	Unicast	1
77						
78	In parallel Quick Sort each process divides the unsorted list into	n Lists	2 Lists	4 Lists	n-1 Lists	2
79						
80	Time Complexity of DFS is? (V – number of vertices, E – number of edges)	$O(V + E)$	$O(V)$	$O(E)$	$O(V * E)$	1
81						
82	A person wants to visit some places. He starts from a vertex and then wants to visit every vertex till it finishes from one vertex, backtracks and then explores other vertices from same vertex. What algorithm he should use?	BFS	DFS	Prim's	Kruskal's	2
83						
84	Given an array of n elements and p processes, in the message-passing version of the parallel quicksort, each process stores -----elements of array	$n * p$	$n - p$	$p/n$	$n/p$	4
85						
86	In parallel quick sort Pivot selection strategy is crucial for	Maintaining load balance	Maintaining uniform distribution of elements in process groups	Effective Pivot selection in next level	all of the above	4
87						

88	In execution of the hypercube formulation of quicksort for d = 3, split along -----dimension to partition sequence into two big blocks, one greater than pivot and other smaller than pivot as shown in diagram	first	scond	third	None of above	3
89						
90	Which Parallel formulation of Quick sort is possible	Shared-Address-Space Parallel Formulation	Message Passing formulation	Hypercube Formulation	All of the above	4
91						
92	Which formulation of Dijkstra's algorithm exploits more parallelism	source-partitioned formulation	source-parallel formulation	Partitioned-Parallel Formulation	All of above	2
93						
94	In Dijkstra's all pair shortest path each process compute the single-source shortest paths for all vertices assigned to it in SOURCE PARTITIONED FORMULATION	TRUE	FALSE			1
95						
96	A complete graph is a graph in which each pair of vertices is adjacent	TRUE	FALSE			1
97						
98	The space required to store the adjacency matrix of a graph with n vertices is	in order of n	in order of $n \log n$	in order of $n^2$	in order of $n/2$	3
99						
10 0	Graph can be represented by	Identity Matrix	Adjacency Matrix	Sprse list	Sparse matrix	2
10 1						
10 2	to solve the all-pairs shortest paths problem which algorithm/s is/are used a) Floyd's algorithm b) Dijkstra's single-source shortest paths c) Prim's Algorithm d) Kruskal's Algorithm	a) and c)	a) and b)	b) and c)	c) and d)	2

10 3						
10 4	Simple backtracking is a depth-first search method that terminates upon finding the first solution.	TRUE	FALSE			1
10 5						
10 6	Best-first search (BFS) algorithms can search both graphs and trees.	TRUE	FALSE			1
10 7						
10 8	A* algorithm is a	BFS algorithm	DFS Algorithm	Prim's Algorithm	Kruskal's Algorithm	1
10 9						
11 0	identify Load-Balancing Scheme/s	Asynchronous Round Robin	Global Round Robin	Random Polling	All above methods	4
11 1						
11 2	important component of best-first search (BFS) algorithms is	Open List	Closed List	Node List	Mode List	1
11 3	<b>Question</b>	a	b	c	d	Ans
11 4	A CUDA program is comprised of two primary components: a host and a _____.	GPU kernel	CPU kernel	OS	none of above	a
11 5	The kernel code is identified by the _____ qualifier with void return type	_host_	_global_	_device_	void	b
11 6	The kernel code is only callable by the host	TRUE	FALSE			a
11 7	The kernel code is executable on the device and host	TRUE	FALSE			b
11 8	Calling a kernel is typically referred to as _____.	kernel thread	kernel initialization	kernel termination	kernel invocation	d
11 9	Host codes in a CUDA application can Initialize a device	TRUE	FALSE			a

<b>12 0</b>	Host codes in a CUDA application can Allocate GPU memory	TRUE	FALSE			<b>a</b>
<b>12 1</b>	A CUDA program is comprised of two primary components: a host and a ____.	GPU kernel	CPU kernel	OS	none of above	<b>a</b>
<b>12 2</b>	A CUDA program is comprised of two primary components: a host and a ____.	GPU kernel	CPU kernel	OS	none of above	<b>a</b>
<b>12 3</b>	The kernel code is identified by the _____ qualifier with void return type	_host_	_global_	_device_	void	<b>b</b>
<b>12 4</b>	Host codes in a CUDA application can not invoke kernels	TRUE	FALSE			<b>b</b>
<b>12 5</b>	CUDA offers the Chevron Syntax to configure and execute a kernel.	TRUE	FALSE			<b>a</b>
<b>12 6</b>	the BlockPerGrid and ThreadPerBlock parameters are related to the _____ model supported by CUDA.	host	kernel	thread abstraction	none of above	<b>c</b>
<b>12 7</b>	_____ is Callable from the device only	_host_	_global_	_device_	none of above	<b>c</b>
<b>12 8</b>	_____ is Callable from the host	_host_	_global_	_device_	none of above	<b>b</b>
<b>12 9</b>	_____ is Callable from the host	_host_	_global_	_device_	none of above	<b>a</b>
<b>13 0</b>	CUDA supports _____ in which code in a single thread is executed by all other threads.	tread division	tread termination	thread abstraction	none of above	<b>c</b>
<b>13 1</b>	In CUDA, a single invoked kernel is referred to as a _____.	block	tread	grid	none of above	<b>c</b>
<b>13 2</b>	A grid is comprised of _____ of threads.	block	bunch	host	none of above	<b>a</b>
<b>13 3</b>	A block is comprised of multiple _____.	treads	bunch	host	none of above	<b>a</b>
<b>13 4</b>	a solution of the problem in representing the parallelism in algorithm is	CUD	PTA	CDA	CUDA	<b>d</b>
<b>13 5</b>	_____ is Callable from the host	_host_	_global_	_device_	none of above	<b>b</b>
<b>13</b>	_____ is Callable from the host	_host_	_global_	_device_	none of above	<b>a</b>

<b>6</b>						
<b>13</b> <b>7</b>	A CUDA program is comprised of two primary components: a host and a _____.	GPU kernel	CPU kernel	OS	none of above	<b>a</b>
<b>13</b> <b>8</b>	The kernel code is identified by the _____ qualifier with void return type	_host_	_global_	_device_	void	<b>b</b>
<b>13</b> <b>9</b>	Host codes in a CUDA application can not Reset a device	TRUE	FALSE			<b>b</b>
<b>14</b> <b>0</b>	Host codes in a CUDA application can not Invoke kernels	TRUE	FALSE			<b>b</b>
<b>14</b> <b>1</b>	A CUDA program is comprised of two primary components: a host and a _____.	GPU kernel	CPU kernel	OS	none of above	<b>a</b>
<b>14</b> <b>2</b>	Calling a kernel is typically referred to as _____.	kernel thread	kernel initialization	kernel termination	kernel invocation	<b>d</b>
<b>14</b> <b>3</b>	In CUDA, a single invoked kernel is referred to as a _____.	block	tread	grid	none of above	<b>c</b>
<b>14</b> <b>4</b>	A grid is comprised of _____ of threads.	block	bunch	host	none of above	<b>a</b>
<b>14</b> <b>5</b>	A block is comprised of multiple _____.	treads	bunch	host	none of above	<b>a</b>
<b>14</b> <b>6</b>	A CUDA program is comprised of two primary components: a host and a _____.	GPU kernel	CPU kernel	OS	none of above	<b>a</b>
<b>14</b> <b>7</b>	_____ is Callable from the host	_host_	_global_	_device_	none of above	<b>a</b>
<b>14</b> <b>8</b>	In CUDA, a single invoked kernel is referred to as a _____.	block	tread	grid	none of above	<b>c</b>
<b>14</b> <b>9</b>	the BlockPerGrid and ThreadPerBlock parameters are related to the _____ model supported by CUDA.	host	kernel	thread abstraction	none of above	<b>c</b>
<b>15</b> <b>0</b>	Host codes in a CUDA application can Transfer data to and from the device	TRUE	FALSE			<b>a</b>
<b>15</b> <b>1</b>	Host codes in a CUDA application can not Deallocate memory on the GPU	TRUE	FALSE			<b>b</b>
<b>15</b> <b>2</b>	Host codes in a CUDA application can not Reset a device	TRUE	FALSE			<b>b</b>

<b>15</b>	Calling a kernel is typically referred to as _____.	kernel thread	kernel initialization	kernel termination	kernel invocation	<b>d</b>
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Date: 23/07/2020

Class : BE Computer  
 Academic Year : 2020-21

Div: A + B  
 Sem : I

Subject : High Performance Computing  
 Exam Date: 23/07/2020

<b><i>Q. No.</i></b>	<b><i>Question Description</i></b>	<b><i>Options</i></b>	<b><i>Correct Answer</i></b>	<b><i>Marks</i></b>	<b><i>CO</i></b>	<b><i>PO</i></b>	<b><i>PSO</i></b>	<b><i>BTL</i></b>
1	Select different aspects of parallelism	A. data intensive applications utilize high aggregate throughput B. server applications utilize high aggregate network bandwidth C. scientific applications typically utilize high processing and memory system performance D. all of the above	<b>D</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>4</b>
2	Select correct answer: DRAM access times have only improved at the rate of roughly ____% per year over this interval.	A. 10 B. 20 C. 40 D. 50	<b>A</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>4</b>
3	Justify, why to use parallel computing?	A. Real world is massively parallel B. Save time and/or time C. Solve larger / more complex problems D. Provide concurrency E. All of the above	<b>E</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>5</b>
4	Analyze, if the second instruction has data dependencies with the first, but the third instruction does not, the first	A. In-order B. Out-of-order C. Both of the above D. None of the above	<b>B</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>4</b>

	and third instructions can be co-scheduled. Which type if this issue is?							
5	Select the parameters which captures Memory system performance	A. Latency B. Bandwidth C. Both of the above D. None of the above	C	2	1	3	3	4
6	Consider the example of a fire-hose. If the water comes out of the hose five seconds after the hydrant is turned on. Once the water starts flowing, if the hydrant delivers water at the rate of 15 gallons/second. Analyze the bandwidth and latency.	A. Bandwidth: 5 gallons/second and Latency: 15 seconds B. Bandwidth: 5*15 gallons/second and Latency: 15 seconds C. Bandwidth: 15 gallons/second and Latency: 5 seconds D. Bandwidth: 3 gallons/second and Latency: 5 seconds	C	2	1	4	3	5
7	Select alternate approaches for Hiding Memory Latency	A. Prefetching B. Multithreading C. spatial locality D. all of the above	D	2	1	3	3	4
8	Select which clause in OpenMP is similar to the private, except values of variables are initialized to corresponding values before the	A. Private B. Firstprivate C. Shared D. All of the above	B	2	1	5	3	4

	parallel directive.						
9	The time which includes all overheads that are determined by the length of the message like bandwidth of links, error checking and correction, etc. is called as	A. Startup time (ts) B. Per-hop time (th) C. Per-word transfer time (tw) D. All of the above	C	2	1	1	3 1
10	Select in which routing technique, Message is divided into packets?	A. Store-and-forward routing B. Packet routing C. cut-through-routing D. in both 2 and 3	D	2	1	3	3 4
11	Which of the following is an efficient method of cache updating?	A. Snoopy writes B. Write through C. Write within D. Buffered write	A	2	1	1	3 1
12	Select which protocol is used for maintaining coherence of multiple processors?	A. Data coherence protocols B. Commit coherence protocols C. Recurrence D. Cache coherence protocols	D	2	1	3	3 4
13	From inter-processor communication, the misses arises are often called	A. Coherence misses B. Commit misses C. Parallel processing D. Hit rate	A	2	1	1	3 1
14	As per Flynn's Classification, where Parallel processing may occur?	A. in the instruction stream B. in the data stream C. both of the above D. none of the above	C	2	1	1	3 1

15	Which of the following projects of Blue Gene is not in development?	A. Blue Gene / L B. Blue Gene / M C. Blue Gene / P D. Blue Gene / Q	<b>B</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>1</b>
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(Mrs. Dhanashree Phalke) (Mrs. Vaishali Kolhe)  
 Subject Teacher Academic Coordinator

( Dr. Kailash Shaw)  
 Dept. NBA Coordinator

(Dr. Vinayak Kottawar)  
 HOD Computer

**Unit Test II**

Date: 26/08/2020

Class : BE Computer  
 Academic Year : 2020-21

Div: A + B  
 Sem : I

Subject : High Performance Computing  
 Exam Date: 26/08/2020

<b><i>Q. No.</i></b>	<b><i>Question Description</i></b>	<b><i>Options 28</i></b>	<b><i>Correct Answer</i></b>	<b><i>Marks</i></b>	<b><i>CO</i></b>	<b><i>PO</i></b>	<b><i>PSO</i></b>	<b><i>BTL</i></b>
1	Task interaction graphs represent _____ dependencies, whereas task dependency graphs represent _____ dependencies.	A. control, data B. task, data C. process, control D. data, control	<b>D</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>4</b>
2	Select correct answer. Which graph represents tasks as nodes and their interactions/data exchange as edges?	A. task dependency graph B. process dependency graph C. process interaction graph D. task interaction graph	<b>D</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>4</b>
3	The average number of tasks that can be processed in parallel over the execution of the program is called as _____	A. average degree of concurrency B. degree of concurrency C. critical path length D. maximum concurrency	<b>A</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>4</b>
4	The number of tasks that can be executed in	A. average concurrency B. degree of concurrency C. critical path length	<b>B</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>4</b>

	parallel is the _____ of a decomposition.	D. maximum concurrency						
5	A decomposition can be illustrated in the form of a directed graph with nodes corresponding to tasks and edges indicating that the result of one task is required for processing the next. Such graph is called as _____	A. process dependency graph B. task dependency graph C. task interaction graph D. process interaction graph	<b>B</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>4</b>
6	In which case, the owner computes rule implies that the output is computed by the process to which the output data is assigned?	A. input data decomposition B. output data decomposition C. Both of the above D. None of the above	<b>B</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>3</b>	<b>5</b>
7	Select relevant task characteristics from the options given below:	A. Task generation B. Task sizes C. Size of data associated with tasks D. All of the above	<b>D</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>4</b>
8	A classic example of game playing - each 15 puzzle board is the example of _____	A. Static Task Generation B. Dynamic Task Generation C. None of the above D. All of the above	<b>B</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>4</b>
9	Analyze task interaction pattern	A. static regular interaction pattern B. static irregular interaction pattern	<b>B</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>5</b>

	of the multiplication of a sparse matrix with a vector.	C. dynamic regular interaction pattern D. dynamic irregular interaction pattern						
10	Select the methods for containing Interaction Overheads.	A. Maximize data locality B. Minimize volume of data exchange C. Minimize frequency of interactions D. Minimize contention and hot-spots E. All of the above	<b>E</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>4</b>
11	Which model is equally suitable to shared-address-space or message-passing paradigms, since the interaction is naturally two ways.	A. Work pool model B. Master slave model C. Data parallel model D. Producer consumer or pipeline model	<b>B</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>4</b>
12	In which type of the model, tasks are dynamically assigned to the processes for balancing the load?	A. Work pool model B. Master slave model C. Data parallel model D. Producer consumer or pipeline model	<b>A</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>4</b>
13	Select the appropriate stage of GPU Pipeline which receives commands from CPU and also pulls geometry information from system memory.	A. pixel processing B. vertex processing C. memory interface D. host interface	<b>D</b>	<b>2</b>	<b>2</b>	<b>12</b>	<b>3</b>	<b>4</b>
14	Select the hardware specifications	A. GPU Clock Speed B. Size of memory bus C. Amount of available memory	<b>E</b>	<b>2</b>	<b>2</b>	<b>12</b>	<b>3</b>	<b>1</b>

	which most affect the GPU cards speed.	D. Memory Clock Rate E. All of the above						
15	Select the appropriate stage of GPU Pipeline where computations include texture mapping and math operations.	A. pixel processing B. vertex processing C. memory interface D. host interface	<b>A</b>	<b>2</b>	<b>2</b>	<b>12</b>	<b>3</b>	<b>1</b>

(Mrs. Dhanashree Phalke)  
Subject Teacher

(Mrs. Vaishali Kolhe)  
Academic Coordinator

( Dr. Kailash Shaw)  
Dept. NBA Coordinator

(Dr. Vinayak Kottawar)  
HOD Computer

**Unit Test III**

Date: 14/10/2020

Class : BE Computer  
 Academic Year : 2020-21

Div: A  
 Sem : I

Subject : High Performance Computing  
 Exam Date: 14/10/2020

<b><i>Q. No.</i></b>	<b><i>Question Description</i></b>	<b><i>Options 28</i></b>	<b><i>Correct Answer</i></b>	<b><i>Marks</i></b>	<b><i>CO</i></b>	<b><i>PO</i></b>	<b><i>PSO</i></b>	<b><i>BTL</i></b>
1	In all-to-one reduction, data items must be combined piece-wise and the result made available at a _____ processor.	A. First B. Last C. Target D. N-1	C	2	3	1	3	4
2	Analyze the Cost of Scatter and Gather .	A. $T=tw \log p + ts m (p-1)$ B. $T=ts \log p + tw m (p-1)$ C. $T=ts \log p - tw m (p-1)$ D. $T=tw \log p - ts m (p-1)$	B	2	3	4	3	4
3	All-to-all personalized communication is also known as _____.	A. partial exchange B. total exchange C. both of the above D. none of the above	B	2	3	1	3	1
4	All-to-all personalized communication is performed independently in each row with clustered messages of size _____ on a mesh.	A. m B. p C. $m\sqrt{p}$ D. $p\sqrt{m}$	C	2	3	1	3	4
5	In All-to-All Personalized Communication on a Ring, the size of the message reduces by _____ at each step	A. m B. p C. m-1 D. p-1	A	2	3	1	3	1

6	All-to-All Broadcast and Reduction algorithm on a Ring terminates in _____ steps.	A. p B. p+1 C. p-1 D. p*p	C	2	3	1	3	1
7	In All-to-all Broadcast on a Mesh, operation performs in which sequence?	A. rowwise, rowwise B. rowwise, columnwise C. columnwise, rowwise D. columnwise, columnwise	B	2	3	1	3	3
8	In the _____ operation, a single node sends a unique message of size m to every other node.	A. Scatter B. gather	A	2	3	3	3	1
9	In the _____ operation, a single node collects a unique message from each node.	A. Scatter B. gather	B	2	3	3	3	1
10	Messages get smaller in _____ and stay constant in _____.	A. broadcast, gather B. gather, broadcast C. scatter , broadcast D. scatter, gather	C	2	3	1	3	4
11	The time taken by all-to-all broadcast on a ring is _____.	A. $T= 2t_s(\sqrt{p - 1}) + t_wm(p-1)$ B. $T= (t_s + t_wm)(p-1)$ C. $T= t_s \log_p + t_wm(p-1)$ D. $T= 2t_s(\sqrt{p - 1}) - t_wm(p-1)$	B	2	3	4	3	4
12	The time taken by all-to-all broadcast on a mesh is _____.	A. $T= 2t_s(\sqrt{p - 1}) + t_wm(p-1)$ B. $T= (t_s + t_wm)(p-1)$ C. $T= t_s \log_p + t_wm(p-1)$ D. $T= 2t_s(\sqrt{p - 1}) - t_wm(p-1)$	A	2	3	4	3	4
13	The time taken by all-to-all broadcast on a hypercube is _____.	A. $T= 2t_s(\sqrt{p - 1}) + t_wm(p-1)$ B. $T= (t_s + t_wm)(p-1)$ C. $T= t_s \log_p + t_wm(p-1)$ D. $T= 2t_s(\sqrt{p - 1}) - t_wm(p-1)$	C	2	3	4	3	4
14	_____ is a special permutation in which	A. Left shift B. Right shift	C	2	3	1	3	1

	node $i$ sends a data packet to node $(i + q) \bmod p$ in a $p$ -node ensemble ( $0 \leq q \leq p$ ).	C. Circular shift D. Linear shift						
15	The prefix-sum operation can be implemented using the _____ kernel	A. all-to-all reduction B. all-to-all broadcast C. one-to-all broadcast D. all-to-one broadcast	<b>B</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>1</b>

(Mrs. Dhanashree Phalke)  
Subject Teacher

(Mrs. Vaishali Kolhe)  
Academic Coordinator

( Dr. Kailash Shaw)  
Dept. NBA Coordinator

(Dr. Vinayak Kottawar)  
HOD Computer

**Unit Test IV**

Date: 09/11/2020

Class : BE Computer  
 Academic Year : 2020-21

Div: A  
 Sem : I

Subject : High Performance Computing  
 Exam Date: 11/11/2020

<b>Q. No.</b>	<b>Question Description</b>	<b>Options 28</b>	<b>Correct Answer</b>	<b>Marks</b>	<b>CO</b>	<b>PO</b>	<b>PSO</b>	<b>BTL</b>
1	Select the parameters on which the parallel runtime of a program depends.	A. Input size B. Number of processors C. Communication parameters of the machine D. All of the above	<b>D</b>	<b>2</b>	<b>4</b>	<b>1</b>	<b>3</b>	<b>4</b>
2	The time that elapses from the moment the first processor starts to the moment the last processor finishes execution is called as _____.	A. Serial runtime B. Parallel runtime C. Overhead runtime D. Excess runtime	<b>B</b>	<b>2</b>	<b>4</b>	<b>4</b>	<b>3</b>	<b>4</b>
3	Select how the overhead function ( $T_o$ ) is calculated.	A. $T_o = T_P - T_S$ B. $T_o = p * n T_P - T_S$ C. $T_o = p T_P - T_S$ D. $T_o = T_P - p T_S$	<b>C</b>	<b>2</b>	<b>4</b>	<b>1</b>	<b>3</b>	<b>1</b>
4	What is the ratio of the time taken to solve a problem on a single processor to the time required to solve the same problem on a parallel computer with $p$ identical processing elements?	A. Efficiency B. Overall time C. Speedup D. Scaleup	<b>C</b>	<b>2</b>	<b>4</b>	<b>1</b>	<b>3</b>	<b>4</b>
5	The parallel time for odd-even sort (efficient)	A. 3.75 B. 3.5	<b>B</b>	<b>2</b>	<b>4</b>	<b>1</b>	<b>3</b>	<b>1</b>

	parallelization of bubble sort) is 50 seconds. The serial time for bubblesort is 175 seconds. Evaluate the speedup of bubble sort.	C. 0.33 D. 0.26						
6	Consider the problem of adding $n$ numbers by using $n$ processing elements. The serial time taken is $\Theta(n)$ and parallel time is $\Theta(\log n)$ . Evaluate the efficiency.	A. $E = \Theta(n / \log n)$ B. $E = \Theta(n \log n)$ C. $E = \Theta(\log n / n)$ D. $E = \Theta(1 / \log n)$	D	2	4	1	3	1
7	What will be the efficiency of cost optimal parallel systems?	A. $E = O(n)$ . B. $E = O(1)$ . C. $E = O(p)$ . D. $E = O(n \log n)$ .	B	2	4	1	3	3
8	Which law states that the maximum speedup of a parallel program is limited by the sequential fraction of the initial sequential program?	A. Amdahl's Law B. Flynn's Law C. Moore's Law D. Van Neumann's Law	A	2	4	3	3	1
9	Arrange the steps for the Matrix-Vector 2-D partitioning:  i) result vector is computed by performing an all-to-one reduction along the columns. ii) Alignment of the vector $x$ along the principal diagonal of the matrix. iii) Copy the vector	A. i, ii, iii B. ii, iii, i C. iii, i, ii D. ii, i, iii	B	2	4	3	3	1

	elements from each diagonal process to all the processes in the corresponding column using $n$ simultaneous broadcasts among all processors in the column.							
10	Arrange the communication sequence in Matrix-Vector 2-D partitioning:  i) all-to-one reduction in each row ii) one-to-all broadcast of each vector element among the $n$ processes of each column iii) one-to-one communication to align the vector along the main diagonal	A. i, ii, iii B. ii, iii, i C. iii, ii, i D. ii, i, iii	C	2	4	1	3	4
11	Parallel time in Rowwise 1-D Partitioning of Matrix-Vector Multiplication where p=n is ____.	A. $\Theta(1)$ B. $\Theta(n \log n)$ C. $\Theta(n^2)$ D. $\Theta(n)$	D	2	4	4	3	4
12	What are the sources of overhead in parallel programs?	A. Interprocess interaction B. Idling C. Excess computation D. All of the above	D	2	4	4	3	4
13	What are the performance metrics of parallel systems?	A. Execution time B. Total parallel overhead C. Speedup	E	2	4	4	3	4

		D. Efficiency E. All of the above						
14	The isoefficiency function determines the ease with which a parallel system can maintain a constant efficiency. True or false?	A. True B. False	<b>A</b>	<b>2</b>	<b>4</b>	<b>1</b>	<b>3</b>	<b>1</b>
15	Which matrix-matrix multiplication algorithm uses a 3-D partitioning?	A. Cannon's algorithm B. DNS algorithm C. Both of the above D. None of the above	<b>B</b>	<b>2</b>	<b>4</b>	<b>1</b>	<b>3</b>	<b>1</b>

(Mrs. Dhanashree Phalke)  
Subject Teacher

(Mrs. Vaishali Kolhe)  
Academic Coordinator

( Dr. Kailash Shaw)  
Dept. NBA Coordinator

(Dr. Vinayak Kottawar)  
HOD Computer

**Prelim Exam**

Date: 29/12/2020

Class : BE Computer  
 Academic Year : 2020-21

Div: A & B  
 Sem : I

Subject : High Performance Computing  
 Exam Date: 31/12/2020

<b>Q. No.</b>	<b>Question Description</b>	<b>Options</b>	<b>Corre ct Answ er</b>	<b>Marks</b>	<b>CO</b>	<b>PO</b>	<b>PSO</b>	<b>BTL</b>
1	Which of the following is the type of parallelism?	<b>a. Bit level parallelism</b> <b>b. Instruction level parallelism</b> <b>c. Loop level parallelism</b> <b>d. All of the above</b>	D	1	1	1,1 2	1	2
2	Which of the parallelism is used by VLIW	<b>a. Bit level parallelism</b> <b>b. Instruction level parallelism</b> <b>c. Loop level parallelism</b> <b>d. Task level Parallelism</b>	B	1	1	1,1 2	1	2
3	Tendency of a software process to access information items whose addresses are near one another known as	<b>a. Spatial Locality</b> <b>b. Temporal locality</b> <b>c. Permanent Locality</b> <b>d. Sequential Locality</b>	a	1	1	1	1	1
4	Parallel Computers are classified based on Flynn's taxonomy which among the following options does not come under this	<b>a. SISD</b> <b>b. SIMD</b> <b>c. MIMD</b> <b>d. SIPD</b>	d	1	1	1,1 2	1	1
5	Which among the following is the popular multistage network	<b>a. Hypercube</b> <b>b. Omega</b>	b	1	1	1	1	2

		<b>c. Gamma</b> <b>d. K-D Mesh</b>						
6	The multicore architecture that consists of dedicated application specific processor cores that would target the issue of running variety of applications to be executed on a computer.	<b>a. Homogeneous core architecture.</b> <b>b. Heterogeneous core architecture.</b> <b>c. Polaris core architecture</b> <b>d. None of the above</b>	<b>b</b>	1	1	<b>1</b>	<b>1</b>	<b>3</b>
7	Decomposition of computation into a small number of large task is	<b>a. Fine grained granularity</b> <b>b. course grained granularity</b> <b>c. coarse grained granularity</b> <b>d. task grained granularity</b>	<b>C</b>	1	2	<b>1</b>	<b>3</b>	<b>1</b>
8	Which among the following is the type of decomposition	<b>a. Data-decomposition</b> <b>b. Hybrid decomposition</b> <b>c. Speculative decomposition</b> <b>d. All of the above</b>	<b>D</b>	1	2	<b>1,1 2</b>	<b>3</b>	<b>2</b>
9	The 15-puzzle problem uses which type of decomposition	<b>a. Data decomposition</b> <b>b. Exploratory decomposition</b> <b>c. Speculative decomposition</b> <b>d. Recursive decomposition</b>	<b>B</b>	1	2	<b>1,4 12</b>	<b>3</b>	<b>2</b>

10	An interaction pattern is considered to be _____ if it has some structure that can be exploited for efficient implementation	<ul style="list-style-type: none"> <li><b>a. Structured interaction</b></li> <li><b>b. unstructured interaction</b></li> <li><b>c. Regular interaction</b></li> <li><b>d. Irregular interaction</b></li> </ul>	C	1	2	<b>1,1 2</b>	<b>3</b>	<b>2</b>
11	The mapping in which tasks are distributed to processes during execution is called as_____	<ul style="list-style-type: none"> <li><b>a. Dynamic mapping</b></li> <li><b>b. Static mapping</b></li> <li><b>c. Pre-execution mapping</b></li> <li><b>d. In-process mapping</b></li> </ul>	a	1	2	<b>1</b>	<b>1</b>	<b>1</b>
12	The parallel algorithm model in which mapping of tasks is done dynamically where pointer to tasks is stored in physically shared list/priority queue/hash table/tree is called	<ul style="list-style-type: none"> <li><b>a. The data parallel model</b></li> <li><b>b. Producer consumer model</b></li> <li><b>c. The task graph model</b></li> <li><b>d. Work pool model</b></li> </ul>	d	1	2	<b>1,2</b>	<b>1</b>	<b>2</b>
13	The world's first GPU is marketed by NVIDIA in 1999 is	<ul style="list-style-type: none"> <li><b>a. GeForce 356</b></li> <li><b>b. GeForce 256</b></li> <li><b>c. GeForce 3800</b></li> <li><b>d. GeForce 956</b></li> </ul>	B	1	6	<b>5</b>	<b>3</b>	<b>1</b>
14	The operation in which data from all processes are combined at a single destination process is	<ul style="list-style-type: none"> <li><b>a. All to one reduction</b></li> <li><b>b. All to all reduction</b></li> <li><b>c. one to all reduction</b></li> <li><b>d. None of the above</b></li> </ul>	A	1	3	<b>1</b>	<b>1</b>	<b>2</b>
15	In scatter operation a single node sends a unique message to every node is also called as	<ul style="list-style-type: none"> <li>a. One-to-one personalized communication</li> <li>b. One-to-all broadcast</li> </ul>	C	1	3	<b>1</b>	<b>1</b>	<b>2</b>

		communication c. One-to-all personalized communication <b>d. all-to-all personalized communication</b>						
16	Single port communication node can communicate on all the channels connected to it and provides apparent speedup	a. True b. False	<b>B</b>	1	3	<b>1</b>	<b>1</b>	<b>1</b>
17	Symmetric multiprocessors architecture are sometimes known as	a. <b>Uniform memory access</b>  b. <b>Static memory access</b>  c. <b>Variable memory access</b>  d. <b>All of the above</b>	<b>A</b>	1	3	<b>1</b>	<b>1</b>	<b>1</b>
18	Heuristic is way of trying	a. <b>To discover something or an idea embedded in a program</b>  b. <b>To search and measure how far a node in a search tree seems to be from a goal</b>  c. <b>To compare two nodes in a search tree to see if one is better than another</b>  d. <b>All of the mentioned</b>	<b>a</b>	1	4	<b>1,2</b>	<b>3</b>	<b>2</b>
19	A * algorithm is based on	a. <b>Breadth-First search</b>  b. <b>Depth-first Search</b>  c. <b>Best first search</b>  d. <b>Hill climbing</b>	<b>C</b>	1	5	<b>1,2</b>	<b>1</b>	<b>2</b>

20	Best – First search can be implemented using the following data structure	<ul style="list-style-type: none"> <li><b>a. Queue</b></li> <li><b>b. Stack</b></li> <li><b>c. Priority Queue</b></li> <li><b>d. Circular Queue</b></li> </ul>	C	1	5	<b>1,2</b>	<b>1</b>	<b>1</b>
21	_____is a measure of the fraction of time for which a processing element is usefully employed	<ul style="list-style-type: none"> <li><b>a. Scalability</b></li> <li><b>b. Efficiency</b></li> <li><b>c. Speedup</b></li> <li><b>d. Isoefficiency</b></li> </ul>	B	1	5	<b>1,2</b>	<b>1</b>	<b>2</b>
22	The _____of a parallel system is a measure of its capacity to increase speedup in proportion to the number of processing elements	<ul style="list-style-type: none"> <li><b>A. speedup</b></li> <li><b>B. Cost</b></li> <li><b>C. Efficiency</b></li> <li><b>D. Scalability</b></li> </ul>	D	1	3	<b>1,1 2</b>	<b>1</b>	<b>2</b>
23	_____helps us determine the best algorithm/architecture combination for a particular problem without explicitly analyzing all possible combinations under all possible co	<ul style="list-style-type: none"> <li><b>a. Isoefficiency Metric of scalability</b></li> <li><b>b. Efficiency metric of scalability</b></li> <li><b>c. Cost metric of scalability</b></li> <li><b>d. None of the above</b></li> </ul>	A	1	3	<b>1,3</b>	<b>1</b>	<b>2</b>
24	It is defined as a ratio of the time taken to solve a problem on a single processing element to the time computer with p identical processing elements	<ul style="list-style-type: none"> <li><b>a. Total parallel overhead</b></li> <li><b>b. Efficiency</b></li> <li><b>c. Cost</b></li> <li><b>d. speedup</b></li> </ul>	D	1	3	<b>1,1 2</b>	<b>1</b>	<b>1</b>
25	In Practice a speedup greater than p is sometimes observed. It is called as_____	<ul style="list-style-type: none"> <li><b>a. scalability effect</b></li> <li><b>b. superscalar effect</b></li> </ul>	C	1	3	<b>1,2, 12</b>	<b>1</b>	<b>1</b>

		c. super linearity effect d. speedup effect						
26	Odd-even transposition sort is not cost-optimal, because time product is	a. $\theta(n^2)$ b. $\theta(n \log n)$ c. $O(n^3)$ d. $O(n + \log n)$	A	1	5	1,2, 5	3	3
27	The quicksort algorithm, which has an average complexity of	a. $O(n^3)$ b. $O(n + \log n)$ c. $\theta(n \log n)$ d. $\theta(n^2)$	C	1	5	1,2, 5	1	3
28	Parallel code executes in many concurrent Device (GPU) threads across multiple parallel processing elements, called	a. Synchronising multiprocessor b. Streaming multiprocessor c. Scalable multiprocessor d. Summative multiprocessor	B	1	6	1,2, 12	1	2
29	_____ partitions the vertices among different processes and has each process compute the single-source shortest path for all vertices assigned to it	a. Source parallel formulation b. Single partitioned formulation c. Source partitioned formulation d. Shortest path partitioned formulation	C	1	5	1,2, 12	3	2
30	A processor, assigned with a thread block that executes	a. Multithreaded DIMS	B	1	2	1	1	1

	code, which we usually call a	<b>processor</b>  <b>b. Multithreaded SIMD processor</b>  <b>c. Multithreaded queue</b>  <b>d. Multithreaded stack</b>						
31	Processor of system, which can read/write GPU memory, is known as	<b>a. Server</b>  <b>b. Kernel</b>  <b>c. Guest</b>  <b>d. Host</b>	<b>D</b>	1	6	<b>1</b>	<b>1</b>	<b>1</b>
32	CUDA stands for	<b>a. Compute uniform device architecture</b>  <b>b. Computing universal device architecture</b>  <b>c. Computer unicode device architecture</b>  <b>d. Compute unified device architecture</b>	<b>D</b>	1	6	<b>1,2, 5</b>	<b>2</b>	<b>1</b>
33	The device that are being used primarily for database, file server and mostly for web application are known as	<b>a. Servers</b>  <b>b. Desktops</b>  <b>c. Tablets</b>  <b>d. Supercomputers</b>	<b>A</b>	1	1	<b>1</b>	<b>1</b>	<b>1</b>
34	GPU are designed for running a large number of complex tasks	<b>a. True</b>  <b>b. False</b>	<b>B</b>	1	6	<b>1,2</b>	<b>1</b>	<b>1</b>
35	The parallel algorithm design contains a number of processes where one process may send the identical data to all other processes is called as	<b>a. All to one broadcast</b>  <b>b. All to all broadcast</b>  <b>c. One to all broadcast</b>  <b>d. None of these</b>	<b>C</b>	1	3	<b>1</b>	<b>1</b>	<b>2</b>
36	The efficient utilization can be done by devising a	<b>a. Recursive doubling</b>  <b>b. Recursive</b>		1	3	<b>1</b>	<b>1</b>	<b>1</b>

	broadcasting algorithm with the method known as	c. Scatter and Gather d. None of these	a					
37	The balanced tree is mapped neutrally from the hypercube algorithm for one-to-all broadcast where intermediate are the _____ and each leaf nodes are the _____	a. switching nodes, processing nodes <b>b. processing nodes, switching nodes</b>	a	1	3	<b>1,1</b> 2	1	2
38	Finding prefix-sum operation is also called as scan operation	a. True <b>b. False</b>	a	1	3	<b>1,1</b> 2	1	1
39	All to all personalized communication is also called as	a. Scan operation b. Total exchange method c. None of these	B	1	3	<b>1,1</b> 2	1	2
40	On which network broadcast and reduction operations performed in two steps: 1. Operations along with row 2. Operations along with column	a. Ring b. Hypercube c. Linear array <b>d. Mesh</b>	d	1	3	<b>1,1</b> 2	1	2
41	Gather operation is also called as all to one reduction	a. True <b>b. False</b>	b	1	3	<b>1,8</b>	1	1
42	The method which is used in various parallel algorithm like Fourier transform, matrix transpose, some parallel database join operations is called as	a. All-to-all personalized communication b. All-to-all Broadcast c. Total exchange method d. Both a & c	d	1	3	<b>1,1</b> 2	1	1
43	Consider a sequence in which numbers are originally arranged<2,4,5,6,1>, then sequence of Prefix sum will be	a. <2,6,11,17,18> b. <6,15,21,22> c. None of these	a	1	3	<b>4</b>	2	3
44	Select the parameters on which the parallel runtime of a program depends.	A. input size B. number of processors C.	D	<b>1</b>	<b>4</b>	1	<b>3</b>	<b>4</b>

		ommunication parameters of the machine D. ll of the above						
45	The time that elapses from the moment the first processor starts to the moment the last processor finishes execution is called as _____.	A. Serial runtime B. Parallel runtime C. Overhead runtime D. Excess runtime	B	1	4	4	3	4
46	Select how the overhead function ( $T_o$ ) is calculated.	A. $T_o = T_p - T_s$ B. $T_o = p * n T_p - T_s$ C. $T_o = p T_p - T_s$ D. $T_o = T_p - p T_s$	C	1	4	1	3	1
47	The parallel time for odd-even sort (efficient parallelization of bubble sort) is 50 seconds. The serial time for bubble sort is 175 seconds. Evaluate the speedup of bubble sort.	A. 3.75 B. 3.5 C. 0.33 D. 0.26	B	1	4	1	3	1
48	Consider the problem of adding $n$ numbers by using $n$ processing elements. The serial time taken is $\Theta(n)$ and parallel time is $\Theta(\log n)$ . Evaluate the efficiency.	A. $E = \Theta(n / \log n)$ B. $E = \Theta(n \log n)$ C. $E = \Theta(\log n / n)$ D. $E = \Theta(1 / \log n)$	D	1	4	1	3	1
49	What will be the efficiency of cost optimal parallel systems?	A. $E = O(n)$ . B. $E = O(1)$ .	B	1	4	1	3	3

		C. $E = O(p)$ .  D. $E = O(n \log n)$ .						
50	Which law states that the maximum speedup of a parallel program is limited by the sequential fraction of the initial sequential program?	A. Amdahl's Law  B. Flynn's Law  C. Moore's Law  D. Van Neumann's Law	<b>A</b>	<b>1</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>1</b>
51	Arrange the steps for the Matrix-Vector 2-D partitioning  i) result vector is computed by performing an all-to-one reduction along the columns.  ii) Alignment of the vector $x$ along the principal diagonal of the matrix.  iii) Copy the vector elements from each diagonal process to all the processes in the corresponding column using $n$ simultaneous broadcasts among all processors in the column.	A. i, ii, iii  B. ii, iii, i  C. iii, i, ii  D. ii, i, iii	<b>B</b>	<b>1</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>1</b>
52	Arrange the communication sequence in Matrix-Vector 2-D partitioning:  i) all-to-one reduction in each row  ii) one-to-all broadcast of each vector element among the $n$ processes of each column  iii) one-to-one	A. i, ii, iii  B. ii, iii, i  C. iii, ii, i  D. ii, i, iii	<b>C</b>	<b>1</b>	<b>4</b>	<b>1</b>	<b>3</b>	<b>4</b>

	communication to align the vector along the main diagonal							
53	Parallel time in Rowwise 1-D Partitioning of Matrix-Vector Multiplication where p=n is _____.	A. $\Theta(1)$ B. $\Theta(n \log n)$ C. $\Theta(n^2)$ D. $\Theta(n)$	D	1	4	4	3	4
54	NVIDIA thought that ‘unifying theme’ of every forms of parallelism is the	a. CDA thread b. PTA thread c. CUDA thread d. CUD thread	c	1	6	1,2, 12	1	2
55	Thread being blocked altogether and being executed in sets of 32 threads, called a	a. Thread block b. 32 thread c. 32 block d. Unit block	a	1	6	1,2, 12	1	2
56	Length of a vector operation in a real program is often	a. Known b. Unknown c. Visible d. Invisible	a	1	6	1,2, 12, 6	1	3
57	A code, known as grid which runs on a GPU consisting of a set of	a. 32 thread b. Unit block c. 32 block d. Thread block	d	1	6	1,1 2,5	1	1
58	NVDIA unvield the industrys first directX 10 GPU is_____	a. GTX 1050	b	1	6	1,1 2,5	1	1

		b. GeForce 8800 GTX c. GeForce GTX 1080 d. GTX 1060				1		
59	The number of instructions being executed defines the	a. Instruction count b. Hit time c. Clock rate d. All above	A	1	2	1	1	1
60	In CUDA Programming kernel is launch using which pair of brackets?	a. <<>>> b. {{{}{}}} c. ((0)) d. [[[]]]	d	1	6	1,2, 12, 5	3	2
61	In CUDA programming the transfer of data between host and device special function used is ___	a. Memcopy() b. Memorycpy() c. cudaMemcpy() d. cudaMemcpy()	c	1	6	1,2, 12, 5	1	1
62	Streaming multiprocessor in CUDA, divides the thread in a block is called as___	a. WRAP b. Packet c. Grid d. Thread block	a	1	6	1,1 2,5	1	2
63	Sources of overheads in parallel program are	a. Idling b. Interprocess communication c. Excess computation d. All of the above	d	1	3	1,1 2,2	1	2
64	What are the sources of overhead in parallel	A. Interprocess interaction	D	1	4	4	3	4

	programs?	B. Idling C. Excess computation D. All of the above						
65	What are the performance metrics of parallel systems?	A. Execution time B. Total parallel overhead C. Speedup D. Efficiency E. All of the above	E	1	4	4	3	4
66	The isoefficiency function determines the ease with which a parallel system can maintain a constant efficiency. True or false?	A. True B. False	A	1	4	1	3	1
67	Which matrix-matrix multiplication algorithm uses a 3-D partitioning?	A. Cannon's algorithm B. DNS algorithm C. Both of the above D. None of the above	B	1	4	1	3	1
68	A solution representing a parallelism in an algorithm is	<b>A. CDA</b> <b>B. PTA</b> <b>C. CUDA</b> <b>D. CUD</b>	C	1	6	1	1	2
69	Blocking optimization is used to improve temporal locality, for reduce	<b>A. Hit miss</b> <b>B. Misses</b>	B	1	5	1	1	2

		<b>C. Hit rate</b>  <b>D. Cache misses</b>						
70	Data are allocated to disks in the RAID at the	<b>A. Block level</b>  <b>B. Cache level</b>  <b>C. Low level</b>  <b>D. High level</b>	<b>A</b>	1	6	<b>1</b>	<b>1</b>	<b>1</b>
71	In CUDA C programming serial code is executed by__and parallel code is executed by__	<b>a. CPU, CPU</b>  <b>b. GPU,CPU</b>  <b>c. GPU, GPU</b>  <b>d. CPU, GPU</b>	<b>d</b>	1	6	<b>1,2, 12, 5</b>	<b>2</b>	<b>2</b>
72	Kernel function is qualified by the qualifier	<b>a. __local__</b>  <b>b. __universal__</b>  <b>c. __global__</b>  <b>d. A or C</b>	<b>C</b>	1	6	<b>1,3</b>	<b>1</b>	<b>1</b>

(Mrs. D.A. Phalke & Mrs. Neha D. Patil) (Mrs. Vaishali Kolhe) ( Dr. Kailash Shaw) (Dr. Vinayak Kottawar)  
 Subject Teacher Academic Coordinator Dept. NBA Coordinator HOD Computer

<b>UNIT ONE</b>	<b>SUB : 410241 HPC</b>					
<b>Sr. No.</b>	<b>Questions</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>Answer</b>
1	A pipeline is like .....	an automobile assembly line	house pipeline	both a and b	a gas line	<b>a</b>
2	Data hazards occur when .....	Greater performance loss	Pipeline changes the order of read/write access to operands	Some functional unit is not fully pipelined	Machine size is limited	<b>b</b>
3	Systems that do not have parallel processing capabilities are	SISD	SIMD	MIMD	All of the above	<b>a</b>
4	How does the number of transistors per chip increase according to Moore 's law?	Quadratically	Linearly	Cubicly	Exponentially	<b>d</b>
5	Parallel processing may occur	in the instruction stream	B. in the data stream	both[A] and [B]	none of the above	<b>c</b>
6	Execution of several activities at the same time.	processing	parallel processing	serial processing	multitasking	<b>b</b>
7	Cache memory works on the principle of	Locality of data	Locality of memory	Locality of reference	Locality of reference & memory	<b>c</b>

8	SIMD represents an organization that _____.	refers to a computer system capable of processing several programs at the same time.	represents organization of single computer containing a control unit, processor unit and a memory unit.	includes many processing units under the supervision of a common control unit	none of the above.	<b>c</b>
9	A processor performing fetch or decoding of different instruction during the execution of another instruction is called _____.	Super-scaling	Pipe-lining	Parallel Computation	None of these	<b>b</b>
10	General MIMD configuration usually called	a multiprocessor	a vector processor	array processor	none of the above.	<b>a</b>
11	A Von Neumann computer uses which one of the following?	SISD	SIMD	MISD	MIMD.	<b>a</b>
12	MIMD stands for	Multiple instruction multiple data	Multiple instruction memory data	Memory instruction multiple data	Multiple information memory data	<b>a</b>
13	MIPS stands for:	Memory Instruction Per Second	Major Instruction Per Second	Main Information Per Second	Million Instruction Per Second	<b>d</b>
14	M.J. Flynn's parallel processing classification is based on:	Multiple Instructions	Multiple data	Both (a) and (b)	None of the above	<b>c</b>
15	VLIW stands for:	Vector Large Instruction Word	Very Long Instruction Word	Very Large Integrated Word	Very Low Integrated Word	<b>b</b>

16	The major disadvantage of pipeline is:	High cost individual dedicated	Initial setup time	If branch instruction is encountered the pipe has to be flushed	All of the above	<b>c</b>
17	A topology that involves Tokens.	Star	Ring	Bus	Daisy Chaining	<b>b</b>
18	multipoint topology is	bus	star	mesh	ring	<b>a</b>
19	In super-scalar mode, all the similar instructions are grouped and executed together.	TRUE	False			<b>a</b>
20	Which mechanism performs an analysis on the code to determine which data items may become unsafe for caching, and they mark those items accordingly?	Directory protocol	Snoopy protocol	Server based cache coherence	Compiler based cache coherence	<b>d</b>
21	How many processors can be organized in 5-dimensional binary hypercube system?	25	10	32	20	<b>c</b>
22	Multiprocessors are classified as _____.	SIMD	MIMD	SISD	MISD	<b>b</b>
23	Which of the following is not one of the interconnection structures?	Crossbar switch	Hypercube system	Single port memory	Time-shared common bus	<b>c</b>
24	Which combinational device is used in crossbar switch for selecting proper memory from multiple addresses?	Multiplexer	Decoder	Encoder	Demultiplexer	<b>a</b>

25	How many switch points are there in crossbar switch network that connects 9 processors to 6 memory modules?	50	63	60	54	<b>d</b>
26	In a three-cube structure, node 101 cannot communicate directly with node?	1	11	100	111	<b>b</b>
27	Which method is used as an alternative way of snooping-based coherence protocol?	Directory protocol	Memory protocol	Compiler based protocol	None of above	<b>a</b>
28	snoopy cache protocol are used in -----based system	bus	mesh	star	hypercube	<b>a</b>
29	superscalar architecture contains -----execution units for instruction execution	multiple	single	none of the above		<b>a</b>
30	time taken by header of a message between two directly connected nodes is called as-----	startup time	per hop time	per word transfer time	packaging time	<b>b</b>
31	the number of switch requirement for a network with n input and n output is -----	n	n <sup>2</sup>	n <sup>3</sup>	n <sup>4</sup>	<b>b</b>
32	which of the following is not static network	bus	ring	mesh	crossbar switch	<b>d</b>
33	In super-scalar processors, ----- mode of execution is used.	In-order	Post order	Out of order	None of the mentioned	<b>c</b>
34	----- have been developed specifically for pipelined systems.	Utility software	Speed up utilities	Optimizing compilers	None of the above	<b>c</b>

35	Which of the following is a combination of several processors on a single chip?	Multicore architecture	RISC architecture	CISC architecture	Subword parallelism	<b>a</b>
36	The important feature of the VLIW is .....	ILP	Cost effectiveness	performance	None of the mentioned	<b>a</b>
37	The parallel execution of operations in VLIW is done according to the schedule determined by .....	sk scheduler	Interpreter	Compiler	Encoder	<b>c</b>
38	The VLIW processors are much simpler as they do not require of .....	Computational register	Complex logic circuits	SSD slots	Scheduling hardware	<b>d</b>
39	The VLIW architecture follows ..... approach to achieve parallelism.	MISD	SISD	SIMD	MIMD	<b>d</b>
40	Which of the following is not a Pipeline Conflicts?	Timing Variations	Branching	Load Balancing	Data Dependency	<b>c</b>

<b>UNIT TWO</b>	<b>SUB : 410241 HPC</b>					
<b>Sr. No.</b>	<b>Questions</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>Answer</b>
1	Task dependency graph is -----	directed	undirected	directed acyclic	undirected acyclic	<b>c</b>
2	In task dependency graph longest directed path between any pair of start and finish node is called as -----	total work	critical path	task path	task length	<b>b</b>
3	which of the following is not a granularity type	course grain	large grain	medium grain	fine grain	<b>b</b>
4	which of the following is a an example of data decomposition	matrix multiplication	merge sort	quick sort	15 puzzal	<b>a</b>
5	which problems can be handled by recursive decomposition	backtracking	greedy method	divide and conquer problem	branch and bound	<b>c</b>
6	In this decomposition problem decomposition goes hand in hand with its execution	data decomposition	recursive decomposition	explorative decomposition	speculative decomposition	<b>c</b>
7	which of the following is not an example of explorative decomposition	n queens problem	15 puzzal problem	tic tac toe	quick sort	<b>d</b>
8	Topological sort can be applied to which of the following graphs?	a) Undirected Cyclic Graphs	b) Directed Cyclic Graphs	c) Undirected Acyclic Graphs	d) Directed Acyclic Graphs	<b>d</b>

9	In most of the cases, topological sort starts from a node which has _____	a) Maximum Degree b) Minimum Degree c) Any degree d) Zero Degree				<b>d</b>
10	Which of the following is not an application of topological sorting?	a) Finding prerequisite of a task b) Finding Deadlock in an Operating System c) Finding Cycle in a graph d) Ordered Statistics				<b>d</b>
11	In -----task are defined before starting the execution of the algorithm	dynamic task static task regular task one way task				<b>b</b>
12	which of the following is not the array distribution method of data partitioning	block cyclic block cyclic chunk				<b>d</b>
13	blocking optimization is used to improve temmporal locality for reduce	hit miss misses hit rate cache misses				<b>b</b>
14	CUDA thought that 'unifying theme' of every form of parallelism is	CDA thread PTA thread CUDA thread CUD thread				<b>c</b>
15	Topological sort of a Directed Acyclic graph is?	a) Always unique b) Always Not unique c) Sometimes unique and sometimes not unique d) Always unique if graph has even number of vertices				<b>c</b>
16	threads being block altogether and being executed in the sets of 32 threads called a	thread block 32 thread 32 block unit block				<b>a</b>
17	True or False: The threads in a thread block are distributed across SM units so that each thread is executed by one SM unit.	TRUE FALSE				<b>a</b>

18	When the topological sort of a graph is unique?	a) When there exists a hamiltonian path in the graph	b) In the presence of multiple nodes with indegree 0	c) In the presence of single node with indegree 0	d) In the presence of single node with outdegree 0	<b>a</b>
19	What is a high performance multi-core processor that can be used to accelerate a wide variety of applications using parallel computing.	CPU	DSP	GPU	CLU	<b>c</b>
20	A good mapping does not depends on which following factor	knowledge of task sizes	the size of data associated with tasks	characteristics of inter-task interactions	task overhead	<b>d</b>
21	CUDA is a parallel computing platform and programming model	TRUE	FALSE			<b>a</b>
22	Which of the following is <i>not</i> a form of parallelism supported by CUDA	Vector parallelism - Floating point computations are executed in parallel on wide vector units	Thread level task parallelism - Different threads execute a different tasks	Block and grid level parallelism - Different blocks or grids execute different tasks	Data parallelism - Different threads and blocks process different parts of data in memory	<b>a</b>
23	The style of parallelism supported on GPUs is best described as	MISD - Multiple Instruction Single Data	SIMT - Single Instruction Multiple Thread	SISD - Single Instruction Single Data	MIMD	<b>b</b>
24	True or false: Functions annotated with the <code>_global_</code> qualifier may be executed on the host or the device	TRUE	FALSE			<b>a</b>

25	Which of the following correctly describes a GPU kernel	A kernel may contain a mix of host and GPU code	All thread blocks involved in the same computation use the same kernel	A kernel is part of the GPU's internal micro-operating system, allowing it to act as an independent host	kernel may contain only host code	<b>b</b>
26	a code known as grid which runs on GPU consisting of a set of	32 thread	unit block	32 block	thread block	<b>d</b>
27	which of the following is not an parallel algorithm model	data parallel model	task graph model	task model	work pool model	<b>c</b>
28	Having load before the store in a running program order, then interchanging this order, results in a	WAW hazards	Destination registers	WAR hazards	Registers	<b>c</b>
29	model based on the passing of stream of data through process arranged in a succession is called as	producer consumer model	hybrid model	task graph model	work pool model	<b>a</b>
30	When instruction i and instruction j are tends to write the same register or the memory location, it is called	Input dependence	Output dependence	Ideal pipeline	Digital call	<b>b</b>
31	Multithreading allowing multiple-threads for sharing the functional units of a	Multiple processor	Single processor	Dual core	Corei5	<b>b</b>
32	Allowing multiple instructions for issuing in a clock cycle, is the goal of	Single-issue processors	Dual-issue processors	Multiple-issue processors	No-issue processors	<b>c</b>

33	OpenGL stands for:	A. Open General Liability	B. Open Graphics Library	C. Open Guide Line	D. Open Graphics Layer	<b>b</b>
34	which of the following is not an advantage of OpenGL	There is more detailed documentation for OpenGL while other API's don't have such detailed documentation.	OpenGL is portable.	OpenGL is more functional than any other API.	It is not a cross-platform API,	<b>d</b>
35	work pool model uses ----- approach for task assignment	static	dynamic	centralized	decentralized	<b>b</b>
36	which of the following is false regarding data parallel model	all task perform same computations	degree of parallelism increase with size of problem	matrix multiplication is example of data parallel	dynamic mapping is done	<b>d</b>
37	which of the following are methods for containing interaction overheads	maximizing data locality	minimize volume of data exchange	min frequency of interactions	all the above	<b>d</b>
38	which of the following are classes of dynamic mapping centralized method	self scheduling	chunk scheduling	both a and b	none of the above	<b>c</b>
39	which of the following is not scheme for static mapping	block distribution	block cyclic distributions	cyclic distributions	self scheduling	<b>d</b>

<b>UNIT THREE</b>	<b>SUB : 410241 HPC</b>					
<b>Sr. No.</b>	<b>Questions</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>Answer</b>
e.g 1	<b>Write down question</b>	<b>Option a</b>	<b>Option b</b>	<b>Option c</b>	<b>Option d</b>	<b>a/b/c/d</b>
1	Group communication operations are built using which primitives?	one to all	all to all	point to point	None of these	<b>c</b>
2	___ can be performed in an identical fashion by inverting the process.	Recursive Doubling	Reduction	Broadcast	None of these	<b>b</b>
3	Broadcast and reduction operations on a mesh is performed	along the rows	along the columns	both a and b concurrently	None of these	<b>c</b>
4	Cost Analysis on a ring is	$(ts + twm)(p - 1)$	$(ts - twm)(p + 1)$	$(tw + tsm)(p - 1)$	$(tw - tsm)(p + 1)$	<b>a</b>
5	Cost Analysis on a mesh is	$2ts(\sqrt{p} + 1) + twm(p - 1)$	$2tw(\sqrt{p} + 1) + tsm(p - 1)$	$2tw(\sqrt{p} - 1) + tsm(p - 1)$	$2ts(\sqrt{p} - 1) + twm(p - 1)$	<b>d</b>
6	Communication between two directly link nodes	Cut-through routing	Store-and-forward routing	Nearest neighbour communication	None	<b>c</b>
7	All-to-one communication (reduction) is the dual of ___ broadcast.	all-to-all	one-to-all	one-to-one	all-to-one	<b>b</b>
8	Which is known as Reduction?	all-to-one	all-to-all	one-to-one	one-to-all	<b>a</b>

9	Which is known as Broadcast?	one-to-one	one-to-all	all-to-all	all-to-one	<b>b</b>
10	The dual of all-to-all broadcast is	all-to-all reduction	all-to-one reduction	Both	None	<b>a</b>
11	All-to-all broadcast algorithm for the 2D mesh is based on the	Linear Array Algorithm	Ring algorithm	Both	None	<b>b</b>
12	In the first phase of 2D Mesh All to All, the message size is __	p	$m * \sqrt{p}$	m	$p * \sqrt{m}$	<b>c</b>
13	In the second phase of 2D Mesh All to All, the message size is __	m	$p * \sqrt{m}$	p	$m * \sqrt{p}$	<b>d</b>
14	In All to All on Hypercube, The size of the message to be transmitted at the next step is ___ by concatenating the received message with their current data	doubled	tripled	halved	no change	<b>a</b>
15	The all-to-all broadcast on Hypercube needs ___ steps	p	$\sqrt{p} - 1$	$\log p$	None	<b>c</b>
16	One-to-All Personalized Communication operation is commonly called __	gather operation	concatenation	scatter operation	None	<b>c</b>
17	The dual of the scatter operation is the	concatenation	gather operation	Both	None	<b>c</b>

18	In Scatter Operation on Hypercube, on each step, the size of the messages communicated is ____	tripled	halved	doubled	no change	<b>b</b>
19	Which is also called "Total Exchange" ?	All-to-all broadcast	All-to-all personalized communication	all-to-one reduction	None	<b>b</b>
20	All-to-all personalized communication can be used in ____	Fourier transform	matrix transpose	sample sort	all of the above	<b>d</b>
21	In collective communication operations, collective means	involve group of processors	involve group of algorithms	involve group of variables	none of these	<b>a</b>
22	efficiency of data parallel algorithm depends on the	efficient implementation of the algorithm	efficient implementation of the operation	both	none	<b>b</b>
23	All processes participate in a single ____ interaction operation.	global	local	wide	variable	<b>a</b>
24	subsets of processes in ____ interaction.	global	local	wide	variable	<b>b</b>
25	Goal of good algorithm is to implement commonly used ____ pattern.	communication	interaction	parallel	regular	<b>a</b>
26	Reduction can be used to find the sum, product, maximum, minimum of ____ of numbers.	tuple	list	sets	all of above	<b>c</b>
27	source ____ is bottleneck.	process	algorithm	list	tuple	<b>a</b>

28	only connections between single pairs of nodes are used at a time is	good utilization	poor utilization	massive utilization	medium utilization	<b>b</b>
29	all processes that have the data can send it again is	recursive doubling	naive approach	reduction	all	<b>a</b>
30	The ___ do not snoop the messages going through them.	nodes	variables	tuple	list	<b>a</b>
31	accumulate results and send with the same pattern is...	broadcast	naive approach	recursive doubling	reduction symmetric	<b>d</b>
32	every node on the linear array has the data and broadcast on the columns with the linear array algorithm in ____	parallel	vertical	horizontal	all	<b>a</b>
33	using different links every time and forwarding in parallel again is	better for congestion	better for reduction	better for communication	better for algorithm	<b>a</b>
34	In a balanced binary tree processing nodes is equal to	leaves	number of elemnts	branch	none	<b>a</b>
35	In one -to- all broadcast there is	divide and conquer type algorithm	sorting type algorithm	searching type algorithm	simple algorithm	<b>a</b>
36	For sake of simplicity, the number of nodes is a power of	1	2	3	4	<b>b</b>
37	Nides with zero in i least significant bits participate in ____	algorithm	broadcast	communication	searching	<b>c</b>

38	every node has to know when to communicate that is	call the procedure	call for broadcast	call for communication	call the congestion	<b>a</b>
39	the procedure is disturbed and require only point-to-point _____	synchronization	communication	both	none	<b>a</b>
40	Renaming relative to the source is _____ the source.	XOR	XNOR	AND	NAND	<b>a</b>

<b>UNIT FOUR</b>	<b>SUB : 410241 HPC</b>					
<b>Sr. No.</b>	<b>Questions</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>Answer</b>
e.g 1	<b>Write down question</b>	Option a	Option b	Option c	Option d	a/b/c/d
1	mathematically efficiency is	$e=s/p$	$e=p/s$	$e^*s=p/2$	$e=p+e/e$	<b>a</b>
2	Cost of a parallel system is sometimes referred to ___ of product	work	processor time	both	none	<b>c</b>
3	Scaling Characteristics of Parallel Programs Ts is	increase	constant	decreases	none	<b>b</b>
4	Speedup tends to saturate and efficiency ___ as a consequence of Amdahl's law.	increase	constant	decreases	none	<b>c</b>
5	Speedup obtained when the problem size is ___ linearly with the number of processing elements.	increase	constant	decreases	depend on problem size	<b>a</b>
6	The $n \times n$ matrix is partitioned among n processors, with each processor storing complete ___ of the matrix.	row	column	both	depend on processor	<b>a</b>
7	cost-optimal parallel systems have an efficiency of ___	1	n	logn	complex	<b>a</b>
8	The $n \times n$ matrix is partitioned among $n^2$ processors such that each processor owns a ___ element.	n	$2n$	single	double	<b>c</b>
9	how many basic communication operations are used in matrix vector multiplication	1	2	3	4	<b>c</b>
10	In DNS algorithm of matrix multiplication it used	1d partition	2d partition	3d partition	both a,b	<b>c</b>

11	In the Pipelined Execution, steps contain	normalization	communication	elimination	all	<b>d</b>
12	the cost of the parallel algorithm is higher than the sequential run time by a factor of __	3/2	2/3	3*2	2/3+3/2	<b>a</b>
13	The load imbalance problem in Parallel Gaussian Elimination: can be alleviated by using a ___ mapping	acyclic	cyclic	both	none	<b>b</b>
14	A parallel algorithm is evaluated by its runtime in function of	the input size,	the number of processors,	the communication parameters.	all	<b>d</b>
15	For a problem consisting of W units of work, p__W processors can be used optimally.	<=	>=	<	>	<b>a</b>
16	$C(W) \_\Theta(W)$ for optimality (necessary condition).	>	<	<=	equals	<b>d</b>
17	many interactions in practical parallel programs occur in ___ pattern	well defined	zig-zac	reverse	straight	<b>a</b>
18	efficient implementation of basic communication operation can improve	performance	communication	algorithm	all	<b>a</b>
19	efficient use of basic communication operations can reduce	development effort and	software quality	both	none	<b>a</b>
20	Group communication operations are built using ___ Messaging primitives.	point-to-point	one-to-all	all-to-one	none	<b>a</b>
21	one processor has a piece of data and it need to send to everyone is	one -to-all	all-to-one	point -to-point	all of above	<b>a</b>
22	the dual of one -to-all is	all-to-one reduction	one -to-all reduction	point -to-point reducption	none	<b>a</b>

23	Data items must be combined piece-wise and the result made available at	target processor finally	target variable finatly get receiver			<b>a</b>
24	wimpleat way to send p-1 messages from source to the other p-1 processors	Algorithm	communication	concurrency	receiver	<b>c</b>
25	In a eight node ring, node ___ is source of broadcast	1	2	8	0	<b>d</b>
26	The processors compute ____ product of the vector element and the loval matrix	local	global	both	none	<b>a</b>
27	one to all broadcast use	recursive doubling	simple algorithm	both	none	<b>a</b>
28	In a broadcast and reduction on a balanced binary tree reduction is done in ____	recursive order	straight order	vertical order	parallel order	<b>a</b>
29	if "X" is the message to broadcast it initially resides at the source node	1	2	8	0	<b>d</b>
30	logical operators used in algorithm are	XOR	AND	both	none	<b>c</b>
31	Generalization of broadcast in Which each processor is	Source as well as destination	only source	only destination	none	<b>a</b>
32	The algorithm terminates in ____ steps	p	p+1	p+2	p-1	<b>d</b>
33	Each node first sends to one of its neighbours the data it need to....	broadcast	identify	verify	none	<b>a</b>
34	The second communication phase is a columnwise ____ broadcast of consolidated	All-to-all	one -to-all	all-to-one	point-to-point	<b>a</b>

35	All nodes collects ____ message corresponding to $\sqrt{p}$ nodes to their respectively	$\sqrt{p}$	p	$p+1$	$p-1$	a
36	It is not possible to port ____ for higher dimensional network	Algorithm	hypercube	both	none	a
37	If we port algorithm to higher dimemsional network it would cause	error	contention	recursion	none	b
38	In the scatter operation ____ node send message to every other node	single	double	triple	none	a
39	The gather Operation is exactly the inverse of ____	scatter operation	recursion operation	execution	none	a
40	Similar communication pattern to all-to-all broadcast except in the ____	reverse order	parallel order	straight order	vertical order	a

<b>UNIT FIVE</b>	<b>SUB : 410241 HPC</b>					
<b>Sr. No.</b>	<b>Questions</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>Answer</b>
e.g 1	<b>Write down question</b>	<b>Option a</b>	<b>Option b</b>	<b>Option c</b>	<b>Option d</b>	<b>a/b/c/d</b>
1	In _____, the number of elements to be sorted is small enough to fit into the process's main memory.	internal sorting	internal searching	external sorting	external searching	<b>a</b>
2	_____ algorithms use auxiliary storage (such as tapes and hard disks) for sorting because the number of elements to be sorted is too large to fit into memory.	internal sorting	internal searching	External sorting	external searching	<b>c</b>
3	____ can be comparison-based or noncomparison-based.	searching	Sorting	both a and b	none of above	<b>b</b>
4	The fundamental operation of comparison-based sorting is _____.	compare-exchange	searching	Sorting	swapping	<b>a</b>
5	The complexity of bubble sort is $\Theta(n^2)$ .	TRUE	FALSE			<b>a</b>
6	Bubble sort is difficult to parallelize since the algorithm has no concurrency.	TRUE	FALSE			<b>a</b>
7	Quicksort is one of the most common sorting algorithms for sequential computers because of its simplicity, low overhead, and optimal average complexity.	TRUE	FALSE			<b>a</b>
8	The performance of quicksort depends critically on the quality of the _____.	non-pivot	pivot	center element	len of array	<b>b</b>

9	the complexity of quicksort is $O(n \log n)$ .	TRUE	FALSE			<b>a</b>
10	DFS begins by expanding the initial node and generating its successors. In each subsequent step, DFS expands one of the most recently generated nodes.	TRUE	FALSE			
11	The main advantage of _____ is that its storage requirement is linear in the depth of the state space being searched.	BFS	DFS	a and b	none of above	<b>b</b>
12	_____ algorithms use a heuristic to guide search.	BFS	DFS	a and b	none of above	<b>a</b>
13	If the heuristic is admissible, the BFS finds the optimal solution.	TRUE	FALSE			<b>a</b>
14	The search overhead factor of the parallel system is defined as the ratio of the work done by the parallel formulation to that done by the sequential formulation	TRUE	FALSE			<b>a</b>
15	The critical issue in parallel depth-first search algorithms is the distribution of the search space among the processors.	TRUE	FALSE			<b>a</b>
16	Graph search involves a closed list, where the major operation is a _____	sorting	searching	lookup	none of above	<b>c</b>
17	_____ algorithms use auxiliary storage (such as tapes and hard disks) for sorting because the number of elements to be sorted is too large to fit into memory.	internal sorting	internal searching	External sorting	external searching	<b>c</b>
18	_____ can be comparison-based or noncomparison-based.	searching	Sorting	both a and b	none of above	<b>b</b>

19	If the heuristic is admissible, the BFS finds the optimal solution.	TRUE	FALSE			<b>a</b>
20	The search overhead factor of the parallel system is defined as the ratio of the work done by the parallel formulation to that done by the sequential formulation	TRUE	FALSE			<b>a</b>
21	Breadth First Search is equivalent to which of the traversal in the Binary Trees?	Pre-order Traversal	Post-order Traversal	Level-order Traversal	In-order Traversal	<b>c</b>
22	Time Complexity of Breadth First Search is? (V – number of vertices, E – number of edges)	$O(V + E)$	$O(V)$	$O(E)$	$O(V^*E)$	<b>a</b>
23	Which of the following is not an application of Breadth First Search?	When the graph is a Binary Tree	When the graph is a Linked List	When the graph is a n-ary Tree	When the graph is a Ternary Tree	<b>b</b>
24	In BFS, how many times a node is visited?	Once	Twice	Equivalent to number of indegree of the node	Thrice	<b>c</b>
25	Is Best First Search a searching algorithm used in graphs.	TRUE	FALSE			<b>a</b>
26	The critical issue in parallel depth-first search algorithms is the distribution of the search space among the processors.	TRUE	FALSE			<b>a</b>
27	Graph search involves a closed list, where the major operation is a _____	sorting	searching	lookup	none of above	<b>c</b>

28	The fundamental operation of comparison-based sorting is _____.	compare-exchange	searching	Sorting	swapping	<b>a</b>
29	The complexity of bubble sort is $\Theta(n^2)$ .	TRUE	FALSE			<b>a</b>
30	DFS begins by expanding the initial node and generating its successors. In each subsequent step, DFS expands one of the most recently generated nodes.	TRUE	FALSE			
31	The main advantage of _____ is that its storage requirement is linear in the depth of the state space being searched.	BFS	DFS	a and b	none of above	<b>b</b>
32	Breadth First Search is equivalent to which of the traversals in the Binary Trees?	Pre-order Traversal	Post-order Traversal	Level-order Traversal	In-order Traversal	<b>c</b>
33	Time Complexity of Breadth First Search is? (V – number of vertices, E – number of edges)	$O(V + E)$	$O(V)$	$O(E)$	$O(V^*E)$	<b>a</b>
34	Which of the following is not an application of Breadth First Search?	When the graph is a Binary Tree	When the graph is a Linked List	When the graph is a n-ary Tree	When the graph is a Ternary Tree	<b>b</b>
35	In BFS, how many times a node is visited?	Once	Twice	Equivalent to number of indegree of the node	Thrice	<b>c</b>
36	Is Best First Search a searching algorithm used in graphs.	TRUE	FALSE			<b>a</b>

37	Which of the following is not a stable sorting algorithm in its typical implementation.	Insertion Sort	Merge Sort	Quick Sort	Bubble Sort	<b>c</b>
38	Which of the following is not true about comparison based sorting algorithms?	The minimum possible time complexity of a comparison based sorting algorithm is $O(n\log n)$ for a random input array	Any comparison based sorting algorithm can be made stable by using position as a criteria when two elements	Counting Sort is not a comparison based sorting algorithm	Heap Sort is not a comparison based sorting algorithm.	<b>d</b>
39	In _____, the number of elements to be sorted is small enough to fit into the process's main memory.	internal sorting	internal searching	external sorting	external searching	<b>a</b>

<b>UNIT SIX</b>	<b>SUB : 410241 HPC</b>					
<b>Sr. No.</b>	<b>Questions</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>Answer</b>
e.g 1	<b>Write down question</b>					
1	A CUDA program is comprised of two primary components: a host and a ____.	GPU kernel	CPU kernel	OS	none of above	<b>a</b>
2	The kernel code is identified by the _____ qualifier with void return type	_host_	_global_	_device_	void	<b>b</b>
3	The kernel code is only callable by the host	TRUE	FALSE			<b>a</b>
4	The kernel code is executable on the device and host	TRUE	FALSE			<b>b</b>
5	Calling a kernel is typically referred to as _____.	kernel thread	kernel initialization	kernel termination	kernel invocation	<b>d</b>
6	Host codes in a CUDA application can Initialize a device	TRUE	FALSE			<b>a</b>
7	Host codes in a CUDA application can Allocate GPU memory	TRUE	FALSE			<b>a</b>
8	A CUDA program is comprised of two primary components: a host and a ____.	GPU kernel	CPU kernel	OS	none of above	<b>a</b>
9	A CUDA program is comprised of two primary components: a host and a ____.	GPU kernel	CPU kernel	OS	none of above	<b>a</b>
10	The kernel code is identified by the _____ qualifier with void return type	_host_	_global_	_device_	void	<b>b</b>
11	Host codes in a CUDA application can not Invoke kernels	TRUE	FALSE			<b>b</b>

12	CUDA offers the Chevron Syntax to configure and execute a kernel.	TRUE	FALSE			<b>a</b>
13	the BlockPerGrid and ThreadPerBlock parameters are related to the _____ model supported by CUDA.	host	kernel	thread abstraction	none of above	<b>c</b>
14	_____ is Callable from the device only	host_	_global_	_device_	none of above	<b>c</b>
15	_____ is Callable from the host	host_	_global_	_device_	none of above	<b>b</b>
16	_____ is Callable from the host	host_	_global_	_device_	none of above	<b>a</b>
17	CUDA supports _____ in which code in a single thread is executed by all other threads.	tread division	tread termination	thread abstraction	none of above	<b>c</b>
18	In CUDA, a single invoked kernel is referred to as a _____.	block	tread	grid	none of above	<b>c</b>
19	A grid is comprised of _____ of threads.	block	bunch	host	none of above	<b>a</b>
20	A block is comprised of multiple _____.	treads	bunch	host	none of above	<b>a</b>
21	a solution of the problem in representing the parallelism in algorithm is	CUD	PTA	CDA	CUDA	<b>d</b>
22	_____ is Callable from the host	host_	_global_	_device_	none of above	<b>b</b>
23	_____ is Callable from the host	host_	_global_	_device_	none of above	<b>a</b>
24	A CUDA program is comprised of two primary components: a host and a _____.	GPU kernel	CPU kernel	OS	none of above	<b>a</b>
25	The kernel code is dentified by the _____ qualifier with void return type	host_	_global_	_device_	void	<b>b</b>

26	Host codes in a CUDA application can not Reset a device	TRUE	FALSE			<b>b</b>
27	Host codes in a CUDA application can not Invoke kernels	TRUE	FALSE			<b>b</b>
28	A CUDA program is comprised of two primary components: a host and a ____.	GPU kernel	CPU kernel	OS	none of above	<b>a</b>
29	Calling a kernel is typically referred to as _____.	kernel thread	kernel initialization	kernel termination	kernel invocation	<b>d</b>
30	In CUDA, a single invoked kernel is referred to as a _____.	block	tread	grid	none of above	<b>c</b>
31	A grid is comprised of _____ of threads.	block	bunch	host	none of above	<b>a</b>
32	A block is comprised of multiple _____.	treads	bunch	host	none of above	<b>a</b>
33	A CUDA program is comprised of two primary components: a host and a _____.	GPU kernel	CPU kernel	OS	none of above	<b>a</b>
34	_____ is Callable from the host	_host_	_global_	_device_	none of above	<b>a</b>
35	In CUDA, a single invoked kernel is referred to as a _____.	block	tread	grid	none of above	<b>c</b>
36	the BlockPerGrid and ThreadPerBlock parameters are related to the _____ model supported by CUDA.	host	kernel	thread abstract ion	none of above	<b>c</b>
37	Host codes in a CUDA application can Transfer data to and from the device	TRUE	FALSE			<b>a</b>
38	Host codes in a CUDA application can not Deallocate memory on the GPU	TRUE	FALSE			<b>b</b>

39	Host codes in a CUDA application can not Reset a device	TRUE	FALSE			<b>b</b>
40	Calling a kernel is typically referred to as _____.	kernel thread	kernel initialization	kernel termination	kernel invocation	<b>d</b>

**1.Following is true about one to all broadcast**

A.In one to all broadcast initially there will be P(Number of processors) copies of messages and after broadcast finally there will be single copy

B.In one to all broadcast initially there will be single copy of message and after broadcast finally there will be P(Number of processors) copies.

[Submit](#)

**Answer**

"In one to all broadcast initially there will be single copy of message and after broadcast finally there will be P(Number of processors) copies."

**2.If total 8 nodes are in ring topology after one to all message broadcasting how many source nodes will be present?**

2

4

8

1

[Submit](#)

**Answer**

8

**3.Current source node selects \_\_\_\_\_ node as next source node in linear/ring one to all message broadcast**

A.nearest node

B.longest node

**Submit**

**Answer**

longest node

**4.In All-to-one reduction after reduction the final copy of message is available on which node?**

A.Source Node

B.Destination Node

C.Both of the above

D.None of these

**Answer**

Destination Node

**5.If there is 4 by 4 mesh topology network present(as per shown in the video) then in how many broadcast cycles will be required to reach message to all 16 nodes?**

2

8

4

16

**Submit**

**Answer**

4

**6.If there are 8 nodes in a ring topology how many message passing cycles will be required to complete reduction process**

1

2

3

4

**Submit**

**Answer**

3

**7.In One to all broadcast using Hypercube topology how source node selects next destination node?**

Node which is having lowest binary code (label)

Node which is having hightest binary code (label)

To all connected node at a time

None of the above

**Submit**

**Answer**

Node which is having highest binary code (label)

**8.If there are 8 nodes connected in ring topology then \_\_\_ number of message passing**

**cycles will be required to complete all to all broadcast in parallel mode.**

3

4

8

7

**Submit**

**Answer**

7

**9.Consider all to all broadcast in ring topology with 8 nodes.How many messages will be**

**present with each node after 3rd step/cycle of communication?**

3

4

7

None of the above

**Submit**

**Answer**

4

**10.If there are 16 messages in 4x4 mesh then total how many message passing cycles**

**will be required to complete all to all broadcast operation?**

4

5

6

8

**Submit**

**Answer**

6

**11.If there are P messages in mxm mesh then total how many message passing cycles**

**will be required to complete all to all broadcast operation?**

$2 \sqrt{P} - 2$

$2 \sqrt{P} - 1$

$2 \sqrt{P}$

None of the above

**Submit**

**Answer**

$2 \sqrt{P} - 2$

**12.**How many message passing cycles required for all-to-all broadcasting in 8 nodes hypercube?

4

3

2

8

**Submit**

**Answer**

3

**13.**In scatter operation after message broadcasting every node avail with same message copy.

True

False

**Submit**

**Answer**

False

**14.CUDA helps do execute code in parallel mode using \_\_**

CPU

GPU

ROM

Cash memory

**Submit**

**Answer**

GPU

**15.In thread-function execution scenario thread is a \_\_**

Work

Worker

Task

None of the above

**Submit**

**Answer**

Worker

**16.In GPU Following statements are true**

Block contains Grid

Grid contains Block

Block contains Threads

SM stands for Streaming MultiMedia

SM stands for Streaming MultiProcessor

**Submit**

**Answer**

“Grid contains Block”, “Block contains Threads”, “SM stands for Streaming MultiProcessor”

**17.Following issue(s) is/are the true about sorting techniques with parallel computing.**

Large sequence is the issue

Where to store output sequence is the issue

Where to store input sequence is the issue

None of the above

**Submit**

**Answer**

“Where to store output sequence is the issue”, “Where to store input sequence is the issue”

**18. Partitioning on series done after \_\_**

Local arrangement

Processess assignments

Global arrangement

None of the above

**Submit**

**Answer**

Global arrangement

**19. In Parallel DFS processes has following roles.(Select multiple choices if applicable)**

Donor

Active

Idle

Recipient

**Submit**

**Answer**

“Donor”, “Recipient”

**20. Suppose there are 16 elements in a series then how many phases will be required to sort the series using parallel odd-even bubble sort?**

8

4

5

15

**Submit**

**Answer**

15

**21. Which are different sources of Overheads in Parallel Programs?**

Interprocess interactions

Process Idling

Large amount of DATA

Excess Computation

**Submit**

**Answer**

“Interprocess interactions”, “Process Idling”, “Excess Computation”

1 / 1 points

1 / 1 attempts

**22.Speedup (S) is....**

The ratio of the time taken to solve a problem on a parallel processors to the time required to solve the same problem on a single processor with p identical processing elements

The ratio of the time taken to solve a problem on a single processor to the time required to solve the same problem on a parallel computer with p identical processing elements

The ratio of number of multiple processors to size of data

None of the above

**Submit**

**Answer**

The ratio of the time taken to solve a problem on a single processor to the time required to solve the same problem on a parallel computer with p identical processing elements

1 / 1 points

1 / 1 attempts

**23.Efficiency is a measure of the fraction of time for which a processing element is usefully employed.**

TRUE

FALSE

**Submit**  
**Answer**

TRUE

	<b>marks</b>	<b>question</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>ans</b>
<b>0</b>	1	Interconnection Networks can be classified as?	Both	Dynamic	Static	Direct Network	Both Static and Dynamic.
<b>1</b>	1	Parallel Computers are used to solve which types of problems.	Both	Algorithmic Problems	Optimization Problems	None	This is an explanation.
<b>2</b>	1	How many clocks control all the stages in a pipeline?	One	Three	Four	Five	One clock Is used to control all the stages.
<b>3</b>	1	Main memory in parallel computing is ____?	Shared	Parallel	Fixed	None	Main memory is shared in parallel computing.
<b>4</b>	1	Which of these is not a class of parallel computing architecture?	Application Checkpointing	Distributed Computing	Symmetric Multiprocessing	Multicore Computing	Ans- (d)- Application checkpointing. is not a class of parallel computer architecture.
<b>5</b>	1	Parallel Computing software solutions and Techniques includes:	All	Automatic Parallelization	Parallel Programming languages.	Application Checkpointing	Parallel computing software solutionincludes all of the following.. This is an explanation
<b>6</b>	2	The Processors are connected to the memory through a set of?	Switches	Cables	Buses	Registers	The Processors are connected thru. the switches.
<b>7</b>	2	Superscalar Architecture has how many execution units?	Two	One	Three	Four	This is an explanation.
<b>8</b>	2	What is used to hold the intermediate output in a pipeline	Intermediate Register	Cache	RAM	ROM	The Intermediate Registers are used to hold the output.
<b>9</b>	2	Which organization performs sequencing of Human Genome?	International Human Genome Sequencing and Consortium	International Sequencing and Consortium for Human Genome	Human Genome Sequencing and Consortium, Org.	Genome Sequencing for Humans and Consortium, Org.	This is an explanation.
<b>10</b>	2	There are how many stages in RISC Processor?	Five	Three	Two	Six	Ans(c)- Five stages are there in a RISC processor.
<b>11</b>	2	Over the last decade, The DRAM access time has improved at what rate per year?	0.1	0.2	0.15	None of the above	The DRAM access time rate has improved at a rate of 10% over the last decade.

	marks	question	A	B	C	D	ans
12	2	Which memory acts as low-latency high bandwidth storage?	Cache	Register	DRAM	EPROM	Cache acts as low latency high bandwidth storage .This is an explanation.
13	2	Which processor architecture is this?	SIMD	MIMD	MISD	MIMD	This is an explaination.
14	2	Which core processor is this?	Quad-Core	Dual-Core	Octa-Core	Single-Core	This diagram shows Quad-Core.
15	2	Which of these is not a scalable design principle?	Data Caching	Decomposition	Simplification	Parsimony	Data Caching is not a principle of scable design.
16	2	The distance between any two nodes in Bus Based network is?	O(1)	O(n Logn)	O(N)	O( $n^2$ )	O(1) is the ditance between any two nodes.
17	2	Early SIMD computers include:	All	MPP	CM-2	Illiac IV	All of these are early staged SIMD parallel computers.
18	2	This is which configuration in Omega networks.	Pass-through	Cross-Over	Shuffle	None	This is called Pass-through configuration.
19	2	Automatic Parallelization technique doesn't includes:	Share Memory	Analyse	Schedule	Parse	Parallelization includes parse, analyse schedule and code generation.
20	2	The Pentium 4 or P4 processor has how many stage pipeline?	20	15	18	10	The P4 processor has 20 staged pipeline. This is an explanation.
21	3	Which protocol is not used to remove concurrent writes?	Identify	Priority	Common	Sum	Sum, Priority and common are used to remove concurrent writes.
22	3	EREW PRAM stands for?	Exclusive Read and Exclusive Write	Erasable Read and Erasable Write PRAM	Easily Read and Easily Write	None	EREW stands for Exclusive Read and Exclsiuve Write PRAM.
23	3	During each clock cycle, multiple instructions are piped into the processor in_____?	Parallel	Series	Both a and b	None	Multiple Instuctiön are piped in parallel. This is an explanation.
24	3	Which Interconnection Network uses this equation.	Multistage Networks	Cross-Bar	Dynamic Networks	Bus-Staged	Multistaged Network uses this eqn.

	marks	question	A	B	C	D	ans
25	3	How many types of parallel computing are available from both proprietary and open source parallel computing vendors?	4	2	3	6	There are generally four types of parallel computing, available from both proprietary and open source parallel computing vendors.
26	3	If a piece of data is repeatedly used, the effective latency of this memory system can be reduced by the cache. The fraction of data references satisfied by the cache is called?	Hit Ratio	Memory ratio	Hit Fraction	Memory Fraction.	If a piece of data is repeatedly used, the effective latency of this memory system can be reduced by the cache. The fraction of data references satisfied by the cache is called the cache hit ratio.
27	3	Superscalar Architecture can create problem in?	Scheduling	Phasing	Data Extraction	Data-Compiling	Superscalar Architecture can cause problems in CPU scheduling.
28	3	In cut-through routing, a message is broken into fixed size units called?	Flits	Flow Digits	Control Digits	All	In cut-through routing, a message is broken into fixed size units called flits.
29	3	The total communication time for cut-through routing is?	A	B	C	D	This is an explanation.
30	1	The Disadvantage of GPU Pipeline is?	Load-balancing	Data balancing	Process balancing	All of the above	This is an explanation.
31	1	Examples of GPU Processors are:	Both	AMD Processors	NVIDIA	None	Both AMD and NVIDIA.
32	1	Simultaneous execution of different programs on a data stream is called?	Stream Parallelism	Data Execution	Data-parallelism	None	Simultaneous execution of different programs on a data stream is called Stream Parallelism.
33	1	Early GPU controllers were known as?	Video Shifters	GPU Shifters	GPU Controllers	Video-Movers	This is an Explanation.
34	1	_____ development is a critical component of problem solving using computers?	Algorithm	Code	Pseudocode	Problem	Algorithm development is a critical component of problem solving using computers

	marks	question	A	B	C	D	ans
35	1	GPU stands for?	Graphics Processsing Unit	Graphical Processing Unit	Gaming Processing Unit	Graph Processing Unit	This is an Explaination.
36	1	What leads to concurrency?	Parallelism	Serial Processing	Decomposition	All	Parallelism leads naturally to Concurrency. For example, Several processes trying to print a file on a single printer.
37	2	The process of determining which screen-space pixel locations are covered by each\triangle is known as?	Rasterization	Pixelisation	Fragmentation	Space-Determining Process	Rasterization is the process of determining which screen-space pixel locations are covered by each\triangle.
38	2	The programmable units of the GPU follow which programming model?	SPMD	MISD	MIMD	SIMD	The programmable units of the GPU follow a single program multiple-data (SPMD) programming model.
39	2	Which space can ease the programming effort, especially if the distribution of data is different in different phases of the algorithm?	Shared Address	Parallel Address	Data- Address	Series-Address	Shared Address space can ease the programming effort, especially if the distribution of data is different in different phases of the algorithm.
40	2	Which are the hardware units that physically perform computations?	Processssor	ALU	CPU	CU	Processors are the hardware units that physically perform computations
41	2	Examples of Graphics API are?	All	DirectX	CUDA	Open-CL	All of the these are examples of Graphics API
42	2	The mechanism by which tasks are assigned to processes for execution is called ____?	Mapping	Computation	Process	None	The mechanism by which tasks are assigned to processes for execution is called mapping.

	marks	question	A	B	C	D	ans
43	2	A decomposition into a large number of small tasks is called _____ granularity.	Fine- grained	Coarse-grained	Vector-granied	All	A decomposition into a large number of small tasks is called fine-grained granularity.
44	2	Identical operations being applied concurrently on different data items is called?	Data- Parallelism	Parallelism	Data Serialsm	Concurrency	Identical operations being applied concurrently on different data items is called Data Parallelism.
45	2	System which do not have parallel processsing capabiities?	SISD	SIMD	MISD	MIMD	This is the explainantion.
46	2	The time and the location in the program of a static one-way interaction is known as ?	Priori	Polling	Decomposition	Execution	The time and the location in the program of a static one-way interaction is known a priori.
47	2	Memory access in RISC architecture is limited to which instructions?	STA and LDA	CALL and RET	Push and POP	MOV and JMP	This is the explaination.
48	2	Which Algorithms can be implemented in both shared-address-space and message-passing paradigms?	Data-Parallel Algo.	Quick-Sort Algo.	Data Algorithm	Bubble Sort Algo.	Data Parallel algorithms can be implemented in both shared-address-space and message-passing paradigms
49	2	Which type of Distribution is this?	Randomized Block Distribution	Block-Cyclic Distribution	Cyclic Distribution	None	This figure shows Randomized Block Distribution.
50	2	An abstraction used to express such dependencies among tasks and their relative order of execution is known as _____?	Task- Dependency Graph.	Dependency Graph.	Time- Dependency Graph	None	An abstraction used to express such dependencies among tasks and their relative order of execution is known as a task-dependency graph.

	marks	question	A	B	C	D	ans
51	3	Which is the simplest way to distribute an array and assign uniform contiguous portions of the array to different processes?	Block Distribution	Array Distribution	Process Distribution	All	Block distributions are some of the simplest ways to distribute an array and assign uniform contiguous portions of the array to different processes
52	3	An example of a decomposition with a regular interaction pattern is?	Image-dithering problem.	Travelling Salesman Problem	Time-complexity Problems	8 Queen problem.	An example of a decomposition with a regular interaction pattern is the problem of image dithering.
53	3	A feature of a task-dependency graph that determines the average degree of concurrency for a given granularity is	Critical-path	Process-path	Granularity.	Concurrency	A feature of a task-dependency graph that determines the average degree of concurrency for a given granularity is critical path.
54	3	The shared-address-space programming paradigms can handle which interactions?	Both	Two way	One way	None	The shared-address-space programming paradigms can handle both one-way and two-way interactions.
55	3	Which distribution can result in an almost perfect load balance due to the extreme fine-grained underlying decomposition.	Cyclic Distribution.	Array Distribution	Block-Cyclic Distribution	Block Distribution.	Cyclic Distribution can result in an almost perfect load balance due to the extreme fine-grained underlying decomposition.
56	3	Data sharing interactions can be categorized as _____ interactions?	Both	Read-Write	Read only	None	Data sharing interactions can be categorized as either read-only or read-write interactions

	marks	question	A	B	C	D	ans
57	3	What is the way of structuring a parallel algorithm by selecting a decomposition and mapping technique and applying the appropriate strategy to minimize interactions called?	Algorithm Model	Parallel Model	Data Model	Mapping Model	Algo. Model is a way of structuring a parallel algorithm by selecting a decomposition and mapping technique and applying the appropriate strategy to minimize interactions.
58	3	Which Algorithm is this?	Serial column based Algo.	Column-Algorithm	Bubble Sort Algo.	None.	This is Serial Column based algorithm.
59	3	Algorithms based on the task graph model include:	All	Matrix-Factorization	Parallel QuickSort	Quicksort	This is an Explaination.
60	1	Which model permits simultaneous communication on all the channels connected to a node?	All-port communication	One-port communication	Dual-port communication	Quad-port communication	All-port communication model permits simultaneous communication on all the channels connected to a node.
61	1	A process sends the same m-word message to every other process, but different processes may broadcast different messages. It is called?	All to All Broadcast	One to All Broadcast	All to All Reduction	None	This is an Explaination.
62	1	The Matrix is transposed using which operation?	All to All personalized communication	One-to-all personalized communication	All-to-one personalized communication	One to one personalized communication.	This is an Explaination.
63	1	Each node in a two-dimensional wraparound mesh has how many ports?	Four	Two	Three	One	Each node in a two-dimensional wraparound mesh has four ports
64	1	Circular shift is a member of a broader class of global communication operations known as?	Permutation	Combination.	Both a and b	None	This is ann explaination.
65	1	We define _____ as the operation in which node i sends a data packet to node $(i + q) \bmod p$ in a p-node ensemble ( $0 < q < p$ ).	Circular q-shift OptimusPrime	Linear shift	Circular shift	Linear q-shift.	We define a circular q-shift as the operation in which node i sends a data packet to node $(i + q) \bmod p$ in a p-node ensemble ( $0 < q < p$ ). Page 183

	marks	question	A	B	C	D	ans
66	1	Parallel algorithms often require a single process to send identical data to all other processes or to a subset of them. This operation is known as?	One to All Broadcast	One to One Broadcast	All to One Broadcast	None	Parallel algorithms often require a single process to send identical data to all other processes or to a subset of them. This operation is known as One to All Broadcast.
67	1	In which Communication each node sends a distinct message of size m to every other node?	All to All personalized communication	One to One personalized communication	All-to-one personalized communication	One-to-all personalized communication.	This is an Explaination.
68	1	All to All personalized communication operation is not used in a which of these parallel algorithms?	Quick Sort	Matrix-Transpose	Fourier Transformation	Database Join operation	This is an Explaination.
69	1	The Dual of one-to-all broadcast is?	All to one Reduction	All to one Broadcast	One to Many Reduction	All to All Broadcast	The dual of one to all Broadcast is called all to one reduction.
70	1	Reduction on a linear array can be performed by _____ the direction and the sequence of communication?	Reversing	Forwarding	Escaping	Widening	Reduction on a linear array can be performed by simply reversing the direction and the sequence of communication
71	2	This equation is used to solve which topology operations in all to all communications?	Hypercube	Mesh	Ring	Linear-Array	This is an Explaination.
72	2	\nThe communication pattern of all-to-all broadcast can be used to perform _____?	Third Variation of Reduction	Second Variation of Reduction	First Variation of Reduction	Fifth Variation of Reduction	This is an Explaination.
73	2	A single node sends a unique message of size m to every other node. This operation is known as _____?	Scatter	Reduction	Gather	Concatenate	In the scatter operation, a single node sends a unique message of size m to every other node.
74	2	The Algorithm represents which broadcast?	All to All Broadcast	All to All Broadcast	All to All Reduction	One to One Reduction	This is an explanation.
75	2	The message can be broadcast in how many steps?	Log(p)	Log( $p^2$ )	One	Sin(p)	The message can be broadcast in log p steps.
76	2	This equation is used to solve which operations?	All to All personalized communication	One-to-all personalized communication	One to one personalized communication	All-to-one personalized communication.	This is an Explaination.

	marks	question	A	B	C	D	ans
77	2	There are how many computations for $n^2$ words of data transferred among the nodes?	$N^3$	Tan n	$E^n$	Log n	There are $n^3$ computations for $n^2$ words of data transferred among the nodes.
78	2	Scatter Operation is also known as?	One-to-all personalized communication	One-to-one personalized communication	All-to-one personalized communication	All-to-all personalized communication.	Scatter operation is also known as One-to-all personalized communication.
79	2	A Hypercube with 2d nodes can be regarded as a d-dimensional mesh with _____ nodes in each dimension.	Two	One	Three	Four	A hypercube with 2d nodes can be regarded as a d-dimensional mesh with two nodes in each dimension
80	2	One-to-all broadcast and all-to-one reduction are used in several important parallel algorithms including?	All	Gaussian Elimination	Shortest path Algo.	Matrix- Vector multiplication	This is an Explanation.
81	2	Each node of the distributed-memory parallel computer is a _____ shared-memory multiprocessor.	NUMA	UMA	CCMA	None	Each node of the distributed-memory parallel computer is a NUMA shared-memory multiprocessor.
82	2	To perform a q-shift, we expand q as a sum of distinct powers of _____?	2	3	e	Log p	To perform a q-shift, we expand q as a sum of distinct powers of 2 .
83	3	In which implementation of circular shift, the entire row to data set is shifted by	Mesh	Hypercube	Ring	Linear	This is an Explanation
84	3	On a p-node hypercube with all-port communication, the coefficients of tw in the expressions for the communication times of one-to-all and all-to-all broadcast and personalized communication are all smaller than their single-port counterparts by a factor of?	Log(p)	Cos(p)	Sin(p)	$E^p$	On a p-node hypercube with all-port communication, the coefficients of tw in the expressions for the communication times of one-to-all and all-to-all broadcast and personalized communication are all smaller than their single-port counterparts by a factor of $\log p$ .

	marks	question	A	B	C	D	ans
85	3	The Equation represents which analysis in All to All Broadcasts?	Cost Analysis	Time Analysis	Data Model Analysis	Space- Time Analysis	Ans-(c) Cost Analysis.
86	3	On a p-node hypercube, the size of each message exchanged in the i th of the log p steps is?	A	B	C	D	A
87	3	Which broadcast is applied on this 3D hypercube?	One to All Broadcast	One to One Broadcast	All to One Broadcast	All to one Reduction	This figure shows One to All Broadcast being applied on 3D hypercube.
88	3	The Equation represents which analysis in One to All Broadcasts?	Cost Analysis	Time Analysis	Data Analysis	Space Analysis	This is an explanation.
89	3	The time for circular shift on a hypercube can be improved by almost a factor of _____ for large messages.	Log p	Cos(p)	$e^p$	Sin p	The time for circular shift on a hypercube can be improved by almost a factor of $\log p$ for large messages.
90	1	The execution time of parallel algorithm doesn't depends upon?	Processor	Input Size	Relative computation	Communication speed	The execution time of a parallel algorithm depends not only on input size but also on the number of processing elements used, and their relative computation and interprocess communication speeds.
91	1	Processing elements in a parallel system may become idle due to many reasons such as:	Both	Synchronization	Load Imbalance	The processing element doesn't become idle.	Both synchronization and load imbalance
92	1	If the scaled-speedup curve is close to linear with respect to the number of processing elements, then the parallel system is considered as?	Scalable	Iso-scalable	Non-Scalable	Scale-Efficient	If the scaled-speedup curve is close to linear with respect to the number of processing elements, then the parallel system is considered scalable

	marks	question	A	B	C	D	ans
93	1	Which system is the combination of an algorithm and the parallel architecture on which it is implemented?	Parallel System	Data- Parallel System	Architecture System	Series System	A parallel system is the combination of an algorithm and the parallel architecture on which it is implemented
94	1	What is defined as the speedup obtained when the problem size is increased linearly with the number of processing elements?	Scalable Speedup	Unscalable Speedup	Superlinearity Speedup	Isoefficiency Speedup	Scalable Speedup defined as the speedup obtained when the problem size is increased linearly with the number of processing elements
95	1	The maximum number of tasks that can be executed simultaneously at any time in a parallel algorithm is called its degree of _____.	Concurrency	Parallelism	Linearity	Execution	The maximum number of tasks that can be executed simultaneously at any time in a parallel algorithm is called its degree of concurrency.
96	1	The isoefficiency due to concurrency in 2-D partitioning is:	$O(p)$	$O(n \log p)$	$O(1)$	$O(n^2)$	This is an explanation.
97	2	The total time collectively spent by all the processing elements over and above that required by the fastest known sequential algorithm for solving the same problem on a single processing element is known as?	Total Overhead	Overhead	Serial Runtime	Parallel Runtime	We define total overhead of a parallel system as the total time collectively spent by all the processing elements over and above that required by the fastest known sequential algorithm for solving the same problem on a single processing element.
98	2	Parallel computations involving matrices and vectors readily lend themselves to data _____.	Decomposition	Composition	Linearity	Parallelism	Parallel computations involving matrices and vectors readily lend themselves to data decomposition.

	marks	question	A	B	C	D	ans
99	2	Parallel 1-D with Pipelining is a _____ algorithm?	Synchronous	Asynchronous	Optimal	Cost-optimal	This is an explanation.
100	2	The serial complexity of Matrix-Matrix Multiplication is:	$\tilde{O}(n^3)$	$O(n^2)$	$O(n)$	$O(n \log n)$	This is an explanation
101	2	What is the problem size for $n \times n$ matrix multiplication?	$\tilde{I}(n^3)$	$\tilde{I}(n \log n)$	$\tilde{I}(n^2)$	$\tilde{I}(1)$	$\tilde{I}(n^3)$ is the problem size.
102	2	The given equation represents which function?	Overhead Function	Parallel Model	Series Overtime	Parallel Overtime	This is an explanation.
103	2	The efficiency of a parallel program can be written as:	A	B	C	D	A
104	2	The total number of steps in the entire pipelined procedure is _____?	$\hat{I}(n)$	$\hat{I}(n^2)$	$\hat{I}(n^3)$	$\hat{I}(1)$	The total number of steps in the entire pipelined procedure is $\hat{I}(n)$
105	2	In Canon's Algorithm, the memory used is?	$\hat{I}(n^2)$	$\hat{I}(n)$	$\hat{I}(n^3)$	$\hat{I}(n \log n)$	This is an explanation.
106	2	Consider the problem of multiplying two $n \times n$ dense, square matrices A and B to yield the product matrix C =:	$A \tilde{\times} B$	$A/B$	$A+B$	$A-B$	Consider the problem of multiplying two $n \times n$ dense, square matrices A and B to yield the product matrix $C = A \tilde{\times} B$ .
107	2	The serial runtime of multiplying a matrix of dimension $n \times n$ with a vector is?	A	B	C	D	A
108	2	_____ is a measure of the fraction of time for which a processing element is usefully employed.	Efficiency	Linearity	Overtime Function	Superlinearity	Efficiency is a measure of the fraction of time for which a processing element is usefully employed.
109	2	When the work performed by a serial algorithm is greater than its parallel formulation or due to hardware features that put the serial implementation at a disadvantage. This phenomena is known as?	Superlinear Speedup	Linear Speedups	Super Linearity	Performance Metrics	This is an explaintion
110	3	The all-to-all broadcast and the computation of $y[i]$ both take time?	$\tilde{I}(n)$	$\tilde{I}(n \log n)$	$\tilde{I}(n^2)$	$\tilde{I}(n^3)$	This is an explanation.

	marks	question	A	B	C	D	ans
111	3	If virtual processing elements are mapped appropriately onto physical processing elements, the overall communication time does not grow by more than a factor of	N/p	P/n	N+p	N*p	If virtual processing elements are mapped appropriately onto physical processing elements, the overall communication time does not grow by more than a factor of n/p
112	3	Parallel execution time can be expressed as a function of problem size, overhead function, and the number of processing elements. The Formed eqn is:	A	B	C	D	A
113	3	In 2-D partitioning, the first alignment takes time=?	Ts + twn/ â^sp.\n	Ts - twn/â^sp.\n	Ts*twn/â^sp.\n	Ts/ twn*â^sp.\n	Ts + twn/â^sp.\n
114	3	Using fewer than the maximum possible number of processing elements to execute a parallel algorithm is called _____?	Scaling Down	Scaling up	Scaling	Stimulation	Using fewer than the maximum possible number of processing elements to execute a parallel algorithm is called scaling down.
115	3	Which of the following is a drawback of matrix matrix multiplication?	Memory Optimal	Efficient	Time-bound	Complex	This is an explanation
116	3	Consider the problem of sorting 1024 numbers (n = 1024, log n = 10) on 32 processing elements. The speedup expected is	P/log n	P*log n	P+log n	N*log p	Consider the problem of sorting 1024 numbers (n = 1024, log n = 10) on 32 processing elements. The speedup expected is p/log n
117	3	Consider the problem of adding n numbers on p processing elements such that p < n and both n and p are powers of 2. The overall parallel execution time of the problem is:	$\hat{e}^{TM}((n/p) \log p).$	$\hat{e}^{TM}((n*p) \log p).$	$\hat{e}^{TM}((p/n) \log p).$	$\hat{e}^{TM}((n) \log p).$	Ans-(a)- $\hat{e}^{TM}((n/p) \log p).$
118	3	DNS algorithm has _____ runtime?	$\hat{a},!(n)$	$\hat{a},!(n^2)$ OptimusPrime	$\hat{a},!(n^3)$	$\hat{a},!(\log n)$	DNS has $\hat{a},!(n)$ runtime Page 189

	marks	question	A	B	C	D	ans
119	3	The serial algorithm requires _____ multiplications and additions in matrix-vector multiplication.\n\n	$N^2$	$N^3$	$\log n$	$n \log(n)$	Ans-(b)- $n^2$ . The serial algorithm requires $n^2$ multiplications and additions.\n\n
120	1	The time required to merge two sorted blocks of $n/p$ elements is _____? \n\n	$\hat{O}(n/p)$	$\hat{O}(n)$	$\hat{O}(p/n)$	$\hat{O}(n \log p)$	The time required to merge two sorted blocks of $n/p$ elements is $\hat{O}(n/p)$ . \n\n
121	1	In Parallel DFS, the stack is split into two equal pieces such that the size of the search space represented by each stack is the same. Such a split is called?.	Half-Split	Half-Split	Parallel-Split	None	The stack is split into two equal pieces such that the size of the search space represented by each stack is the same. Such a split is called a half-split.
122	1	To avoid sending very small amounts of work, nodes beyond a specified stack depth are not given away. This depth is called the _____ depth.	Cut-Off	Breakdown	Full	Series	To avoid sending very small amounts of work, nodes beyond a specified stack depth are not given away. This depth is called the cutoff depth.
123	1	In sequential sorting algorithms, the input and the sorted sequences are stored in which memory?	Process Memory	Secondary Memory	Main Memory	External Memory	In sequential sorting algorithms, the input and the sorted sequences are stored in the process's memory
124	1	Each process sends its block to the other process. Now, each process merges the two sorted blocks and retains only the appropriate half of the merged block. We refer to this operation as?	Compare-Split	Split	Compare	Exchange.	Each process sends its block to the other process. Now, each process merges the two sorted blocks and retains only the appropriate half of the merged block. We refer to this operation as compare-split.

	marks	question	A	B	C	D	ans
125	1	Each process compares the received element with its own and retains the appropriate element. We refer this operation as _____?	Compare Exchange	Exchange	Process-Exchange	All	Each process compares the received element with its own and retains the appropriate element. We refer this as compare exchange.
126	1	Which algorithm maintains the unexpanded nodes in the search graph, ordered according to their l-value?	Parallel BFS	Parallel DFS	Both a and b	None	Parallel BFS maintains the unexpanded nodes in the search graph, ordered according to their l-value.
127	1	The critical issue in parallel depth-first search algorithms is the distribution of the search space among the _____?	Processor	Space	Memory	Blocks	The critical issue in parallel depth-first search algorithms is the distribution of the search space among the processors
128	2	Enumeration Sort uses how many processes to sort n elements?	$N^2$	Logn	$N^3$	N	This is an explanation.
129	2	Which sequence is a sequence of elements $\langle a_0, a_1, \dots, a_{n-1} \rangle$ with the property that either (1) there exists an index $i, 0 \leq i \leq n - 1$ , such that $\langle a_0, \dots, a_i \rangle$ is monotonically increasing and $\langle a_{i+1}, \dots, a_{n-1} \rangle$ is monotonically decreasing, or (2) there exists a cyclic shift of indices so that (1) is satisfied.	Bitonic Sequence	Acyclic Sequence	Asymptotic Sequence	Cyclic Sequence.	A bitonic sequence is a sequence of elements $\langle a_0, a_1, \dots, a_{n-1} \rangle$ with the property that either (1) there exists an index $i, 0 \leq i \leq n - 1$ , such that $\langle a_0, \dots, a_i \rangle$ is monotonically increasing and $\langle a_{i+1}, \dots, a_{n-1} \rangle$ is monotonically decreasing, or (2) there exists a cyclic shift of indices so that (1) is satisfied

	marks	question	A	B	C	D	ans
130	2	To make a substantial improvement over odd-even transposition sort, we need an algorithm that moves elements long distances. Which one of these is such serial sorting algorithm?	Shell Sort	Linear Sort	Quick-Sort	Bubble Sort	To make a substantial improvement over odd-even transposition sort, we need an algorithm that moves elements long distances. Shellsort is one such serial sorting algorithm.
131	2	Quick-Sort is a _____ algorithm?	Divide and Conquer	Greedy Approach	Both a and b	None	Quicksort is a Divide and Conquer algorithm.
132	2	The _____ transposition algorithm sorts n elements in n phases (n is even), each of which requires n/2 compare-exchange operations.	Odd-Even	Odd	Even	None	This is an explaination.
133	2	The average time complexity for Bucket Sort is?	$O(n+k)$	$O(n \log(n+k))$	$O(n^3)$	$\hat{O}(n^2)$	The average time complexity for Bucket Sort is $O(n + k)$ .
134	2	A popular serial algorithm for sorting an array of n elements whose values are uniformly distributed over an interval $[a, b]$ is which algorithm?	Bucket Sort	Quick-Sort Algo.	Linear Sort	Bubble-Sort	A popular serial algorithm for sorting an array of n elements whose values are uniformly distributed over an interval $[a, b]$ is the bucket sort algorithm
135	2	Best Case time complexity of Bubble Sort is:	$O(n)$	$O(n^3)$	$O(n \log n)$	$O(n^2)$	Best case complexity of bubblesort is $O(n)$ .

	marks	question	A	B	C	D	ans
136	2	When more than one process tries to write to the same memory location, only one arbitrarily chosen process is allowed to write, and the remaining writes are ignored. This process is called _____ in quick sort.	CRCW-PRAM	PRAM	Partitioning	CRCW	When more than one process tries to write to the same memory location, only one arbitrarily chosen process is allowed to write, and the remaining writes are ignored. It is called CRCW PRAM quick sort algo.
137	2	Average Time Complexity in a quicksort algorithm is:	$O(n \log n)$	$O(n)$	$O(n^3)$	$\hat{O}(n^2)$	This is an explaination.
138	2	The isoefficiency function of Global Round Robin (GRR) is:	$O(p^2 \log p)$	$O(p \log p)$	$O(\log p)$	$O(p^2)$	The isoefficiency function of GRR is $O(p^2 \log p)$
139	2	A _____ is a device with two inputs x and y and two outputs $x'$ and $y'$ in a Sorting Network.	Comparator	Router	Separator	Switch.	A comparator is a device with two inputs x and y and two outputs $x'$ and $y'$
140	2	If T is a DFS tree in G then the parallel implementation of the algorithm runs in _____ time complexity.	$O(t)$	$O(t \log n)$	$O(\log t)$	$O(1)$	If T is a DFS tree in G then the parallel implementation of the algorithm outputs a proof that can be verified in $O(t)$ time complexity.
141	2	In the quest for fast sorting methods, a number of networks have been designed that sort n elements in time significantly smaller than _____?	$\hat{O}(n \log n)$	$\hat{O}(n)$	$\hat{O}(1)$	$\hat{O}(n^2)$	In the quest for fast sorting methods, a number of networks have been designed that sort n elements in time significantly smaller than $\hat{O}(n \log n)$ .
142	2	The average value of the search overhead factor in parallel DFS is less than _____?	One	Two	Three	Four	The average value of the search overhead factor in parallel DFS is less than one
143	3	Parallel runtime for Ring architecture in a bitonic sort is:	$\hat{O}(n)$	$\hat{O}(n \log n)$ OptimusPrime	$\hat{O}(n^2)$	$\hat{O}(n^3)$	Parallel runtime for Ring architecture in a bitonic sort is $\hat{O}(n)$ Page 193

	marks	question	A	B	C	D	ans
144	3	The Sequential Complexity of Odd-Even Transposition Algorithm is:	$\hat{O}(n^2)$	$\hat{O}(n\log n)$	$\hat{O}(n^3)$	$\hat{O}(n)$	This is an explanation.
145	3	The Algorithm represents which bubble sort:	Sequential Bubble Sort	Circular Bubble Sort	Simple Bubble Sort	Linear Bubble Sort	This is an explanation.
146	3	Enumeration Sort uses how much time to sort n elements?	$\hat{O}(1)$	$\hat{O}(n\log n)$	$\hat{O}(n^2)$	$\hat{O}(n)$	This is an explanation.
147	3	The _____ algorithm relies on the binary representation of the elements to be sorted.	Radix-sort	Bubble Sort	Quick-Sort	Bucket-Sort	The radix sort algorithm relies on the binary representation of the elements to be sorted.
148	3	Parallel runtime for Mesh architecture in a bitonic sort is:	$\hat{O}(n/\log n)$	$\hat{O}(n)$	$\hat{O}(n^2)$	$\hat{O}(n^3)$	This is an explanation.
149	1	The number of threads in a thread block is limited by the architecture to a total of how many threads per block?	512	502	510	412	The number of threads in a thread block is also limited by the architecture to a total of 512 threads per block
150	1	CUDA Architecture is mainly provided by which company?	NVIDIA	Intel	Apple	IBM	NVIDIA provides CUDA services.
151	1	In CUDA Architecture, what are subprograms called?	Kernel	Grid	Element	Blocks	Subprograms are called kernels.
152	1	What is the fullform of CUDA?	Compute Unified Device Architecture	Computer Unified Device Architecture	Common USB Device Architecture	Common Unified Disk Architecture	CUDA Stands for Compute Unified Device Architecture.
153	2	Which of these is not an application of CUDA Arhitecture?	Thermo Dynamics	Neural Networks	VLSI Stimulation	Fluid Dynamics	CUDA architecture has no use on Thermo Dynamics.
154	2	CUDA programming is especially well-suited to address problems that can be expressed as _____ computations.	Data parallel	Task Parallel	Both a and b	None	CUDA programming is especially well-suited to address problems that can be expressed as dataparallel computations.
155	2	CUDA C/C++ uses which keyword in programming:	global	kernel	Cuda_void	nvcc	This is an explanation.
156	2	CUDA programs are saved with _____ extension.	.cd	OptimusPrime	.cc	.cu	This is an explanation. Page 194

	marks	question	A	B	C	D	ans
157	2	The Kepler K20-X chip block, contains _____ streaming multiprocessors\n(SMs).	15	8	16	7	The Kepler K20X chip block diagram, containing 15 streaming multiprocessors (SMs)
158	2	The Kepler K20X architecture increases the register file size to:	64K	32K	128K	256K	The K20X architecture increases the register file size to 64K
159	2	The register file in a GPU is of what size?	2 MB	1 MB	3MB	1024B	Register size in a GPU is 2MB.
160	2	NVIDIAâ€™s GPU computing platform is not enabled on which of the following product families:	AMD	Tegra	Quadro	Tesla	This is an explaination.
161	2	Tesla K-40 has compute capability of:	3.5	3.2	3.4	3.1	This is an explaination.
162	2	The SIMD unit creates, manages, schedules and executes _____ threads simultaneously to create a warp.	32	16	24	8	The SIMD unit creates, manages, schedules and executes 32 threads simultaneously to create a warp
163	2	Which hardware is used by the host interface to fasten the transfer of bulk data to and fro the graphics pipeline?	Direct Memory Access	Switch	Hub	Memory Hardware	This is an Explaination
164	2	A _____ is a collection of thread blocks of the same thread dimensionality which all execute the same kernel.	Grid	Core	Element	Blcoks	A â€˜gridâ€™ is a collection of thread blocks of the same thread dimensionality which all execute the same kernel
165	2	Active Warps can be classified into how many types?	3	2	4	5	This is an explaination.
166	2	All threads in a grid share the same _____ space.	Global memory	Local Memory	Synchronized Memory	All	All threads in a grid\nshare the same global memory space
167	2	CUDA was introduced in which year?	2007	2006	2008	2010	This is an explaination.

	marks	question	A	B	C	D	ans
168	3	Unlike a C function call, all CUDA kernel launches are:	Asynchronous	Synchronous	Both a and b	None	Unlike a C function call, all CUDA kernel launches are asynchronous
169	3	A warp consists of _____ consecutive threads and all threads in a warp are executed in Single Instruction Multiple Thread (SIMT) fashion.	32	16	64	128	A warp consists of 32 consecutive threads and all threads in a warp are executed in Single Instruction Multiple Thread (SIMT) fashion
170	3	There are how many streaming multiprocessors in CUDA architecture?	16	8	12	4	This is an explanation.
171	3	In CUDA programming, if CPU is the host then device will be:	GPU	Compiler	HDD	GPGPU	This is an explanation.
172	3	Both grids and blocks use the _____ type with three unsigned integer fields.	Dim3	Dim2	Dim1	Dim4	Both grids and blocks use the dim3 type with three unsigned integer fields
173	3	Tesla P100 GPU based on the Pascal GPU Architecture has 56 Streaming Multiprocessors (SMs), each capable of supporting up to _____ active threads.	2048	512	1024	256	Tesla P100 GPU based on the Pascal GPU Architecture has 56 Streaming Multiprocessors (SMs), each capable of supporting up to 2048 active threads.
174	3	The maximum size at each level of the thread hierarchy is _____ dependent.	Device	Host	Compiler	Memory	The maximum size at each level of the thread hierarchy is device dependent.
175	3	Intel I7 has the memory bus of width:	19B	180B	152B	102B	This is an explanation.
176	3	The _____ is the heart of the GPU architecture:	Streaming Multiprocessor	Multiprocessor	CUDA	Compiler	The Streaming Multiprocessor (SM) is the heart of the GPU architecture.

	<b>marks</b>	<b>question</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>ans</b>
<b>177</b>	3	A kernel is defined using the _____ declaration specification	global	host	device	void	A kernel is defined using the\n____ declaration specification
<b>178</b>	3	The function printThreadInfo() is not used to print out which of the following information about each thread:	Memory Allocations	Block Index	Matrix Coordinates	Control-Index	Ans-(d)- Memory Allocations.

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## UNIT 1

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1. Which is the type of Microcomputer Memory

- Address
  - Contents
  - Both a and b
  - none
- Ans:**  
Both a and b

2. A collection of lines that connects several devices is called

- Bus
  - Peripheral connection wires
  - Both a and b
  - internal wires
- Ans:**  
Bus

3. Conventional architectures coarsely comprise of a

- Processor
  - Memory System
  - Data path
  - All of the above
- Ans:**  
All of the above

4. VLIW processors rely on

- Compile time analysis
  - Initial time analysis
  - Final time analysis
  - id time analysis
- Ans:**  
Compile time analysis

5. HPC is not used in high span bridges

- True
  - False
- Ans:**  
False

6. The access time of memory is ..... the time required for performing any single CPU operation.

- longer than
- shorter than

negligible than  
same as

**Ans:**  
longer than

7. Data intensive applications utilize\_

High aggregate throughput  
High aggregate network bandwidth  
high processing and memory system performance  
none of above

**Ans:**  
High aggregate throughput

8. Memory system performance is largely captured by\_

Latency  
bandwidth  
both a and b  
none of above

**Ans:**  
both a and b

9. A processor performing fetch or decoding of different instruction during the execution of another instruction is called \_ .

Super-scaling  
Pipe-lining  
Parallel Computation  
none of above

**Ans:**  
Pipe-lining

10. For a given FINITE number of instructions to be executed, which architecture of the processor provides for a faster execution ?

ISA  
ANSA  
Super-scalar  
All of the above

**Ans:**  
Super-scalar

high performance computing mcq sppu  
11. HPC works out to be economical.

True  
false  
**Ans:**  
True

12. High Performance Computing of the Computer System tasks are done by

- Node Cluster
- Network Cluster
- Beowulf Cluster
- Stratified Cluster

**Ans:**

Beowulf Cluster

13. Octa Core Processors are the processors of the computer system that contains

- 2 Processors
- 4 Processors
- 6 Processors
- 8 Processors

**Ans:**

8 Processors

14. Parallel computing uses \_ execution

- sequential
- unique
- simultaneous
- None of above

**Ans:**

simultaneous

15. Which of the following is NOT a characteristic of parallel computing?

- Breaks a task into pieces
- Uses a single processor or computer
- Simultaneous execution
- May use networking

**Ans:**

Uses a single processor or computer

16. Which of the following is true about parallel computing performance?

- Computations use multiple processors
- There is an increase in speed
- The increase in speed is loosely tied to the number of processor or computers used
- All of the **Ans:**s are correct.

**Ans:**

All of the **Ans:**s are correct.

17. \_\_ leads to concurrency.

- Serialization
- Parallelism
- Serial processing
- Distribution

**Ans:**

Parallelism

18. MIPS stands for?

Mandatory Instructions/sec

Millions of Instructions/sec

Most of Instructions/sec

Many Instructions / sec

**Ans:**

Millions of Instructions/sec

19. Which MIMD systems are best scalable with respect to the number of processors

Distributed memory computers

ccNUMA systems

Symmetric multiprocessors

None of above

**Ans:**

Distributed memory computers

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20. To which class of systems does the von Neumann computer belong?

SIMD (Single Instruction Multiple Data)

MIMD (Multiple Instruction Multiple Data)

MISD (Multiple Instruction Single Data)

SISD (Single Instruction Single Data)

**Ans:**

SISD (Single Instruction Single Data)

21. Which of the architecture is power efficient?

CISC

RISC

ISA

IANA

**Ans:**

RISC

22. Pipe-lining is a unique feature of \_.

RISC

CISC

ISA

IANA

**Ans:**

RISC

23. The computer architecture aimed at reducing the time of execution of instructions is \_.

RISC  
CISC  
ISA  
IANA  
**Ans:**  
RISC

24. Type of microcomputer memory is

processor memory  
primary memory  
secondary memory  
All of above

**Ans:**  
All of above

25. A pipeline is like\_

Overlaps various stages of instruction execution to achieve performance.  
House pipeline  
Both a and b  
A gas line

**Ans:**  
Overlaps various stages of instruction execution to achieve performance.

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26. Scheduling of instructions is determined\_

True Data Dependency  
Resource Dependency  
Branch Dependency  
All of above

**Ans:**

All of above

27. The fraction of data references satisfied by the cache is called\_

Cache hit ratio  
Cache fit ratio  
Cache best ratio  
none of above

**Ans:**  
Cache hit ratio

28. A single control unit that dispatches the same Instruction to various processors is\_\_

SIMD  
SPMD  
MIMD  
none of above

**Ans:**

SIMD

29. The primary forms of data exchange between parallel tasks are\_

Accessing a shared data space

Exchanging messages.

Both A and B

none of above

**Ans:**

Both A and B

30. Switches map a fixed number of inputs to outputs.

True

False

**Ans:**

True

---

## UNIT 2

---

1. The First step in developing a parallel algorithm is\_

To Decompose the problem into tasks that can be executed concurrently

Execute directly

Execute indirectly

None of Above

**Ans:**

To Decompose the problem into tasks that can be executed concurrently

2. The number of tasks into which a problem is decomposed determines its\_

Granularity

Priority

Modernity

None of Above

**Ans:**

Granularity

3. The length of the longest path in a task dependency graph is called\_

the critical path length

the critical data length

the critical bit length

None of Above

**Ans:**

the critical path length

4. The graph of tasks (nodes) and their interactions/data exchange (edges)\_

Is referred to as a task interaction graph  
Is referred to as a task Communication graph  
Is referred to as a task interface graph  
None of Above

**Ans:**

Is referred to as a task interaction graph

5. Mappings are determined by\_

task dependency  
task interaction graphs  
Both A and B  
None of Above

**Ans:**

Both A and B

6. Decomposition Techniques are\_

recursive decomposition  
data decomposition  
exploratory decomposition  
speculative decomposition  
All of above

**Ans:**

All of above

7. The Owner Computes rule generally states that the process assigned a particular data item is responsible for \_

All computation associated with it  
Only one computation  
Only two computation  
Only occasionally computation

**Ans:**

All computation associated with it

8. A simple application of exploratory decomposition is\_

The solution to a 15 puzzle  
The solution to 20 puzzle  
The solution to any puzzle  
None of Above

**Ans:**

The solution to a 15 puzzle

9. Speculative Decomposition consist of \_

conservative approaches  
optimistic approaches  
Both A and B  
only B

**Ans:**

Both A and B

hpc mcq questions

10. task characteristics include:

Task generation.

Task sizes.

Size of data associated with tasks.

All of above

**Ans:**

All of above

11. What is a high performance multi-core processor that can be used to accelerate a wide variety of applications using parallel computing.

CLU

GPU

CPU

DSP

**Ans:**

GPU

12. What is GPU?

Grouped Processing Unit

Graphics Processing Unit

Graphical Performance Utility

Graphical Portable Unit

**Ans:**

Graphics Processing Unit

13. A code, known as GRID, which runs on GPU consisting of a set of

32 Thread

32 Block

Unit Block

Thread Block

**Ans:**

Thread Block

14. Interprocessor communication that takes place

Centralized memory

Shared memory

Message passing

Both A and B

**Ans:**

Both A and B

15. Decomposition into a large number of tasks results in coarse-grained decomposition

True

False

**Ans:**

False

16. Relevant task characteristics include

Task generation.

Task sizes

Size of data associated with tasks

Overhead

both A and B

**Ans:**

both A and B

17. The fetch and execution cycles are interleaved with the help of \_\_

Modification in processor architecture

Clock

Special unit

Control unit

**Ans:**

Clock

18. The processor of system which can read /write GPU memory is known as

kernal

device

Server

Host

**Ans:**

Host

19. Increasing the granularity of decomposition and utilizing the resulting concurrency to perform more tasks in parallel decreases performance.

TRUE

FALSE

**Ans:**

FALSE

Parallel computing mcq with answers

20. If there is dependency between tasks it implies there is no need of interaction between them.

TRUE

FALSE

**Ans:**

FALSE

21. Parallel quick sort is example of task parallel model

TRUE

FALSE

**Ans:**

TRUE

22. True Data Dependency is

The result of one operation is an input to the next.

Two operations require the same resource.

**Ans:**

The result of one operation is an input to the next.

23. What is Granularity ?

The size of database

The size of data item

The size of record

The size of file

**Ans:**

The size of data item

24. In coarse-grained parallelism, a program is split into ..... task and  
..... Size

Large tasks , Smaller Size

Small Tasks , Larger Size

Small Tasks , Smaller Size

Equal task, Equal Size

**Ans:**

Large tasks , Smaller Size

---

## UNIT 3

---

1. The primary and essential mechanism to support the sparse matrices is

Gather-scatter operations

Gather operations

Scatter operations

Gather-scatter technique

**Ans:**

Gather-scatter operations

2. In the gather operation, a single node collects a -----

Unique message from each node

Unique message from only one node

Different message from each node

None of Above

**Ans:**

Unique message from each node

3. In the scatter operation, a single node sends a \_\_\_\_\_

Unique message of size m to every other node

Different message of size m to every other node

Different message of different size m to every other node

All of Above

**Ans:**

Unique message of size m to every other node

4. Is All to all Broadcasting is same as All to all personalized communication?

Yes

No

**Ans:**

No

5. Is scatter operation is same as Broadcast?

Yes

No

**Ans:**

No

6. All-to-all personalized communication is also known as

Total Exchange

Personal Message

Scatter

Gather

**Ans:**

Total Exchange

7. By which way, scatter operation is different than broadcast

Message size

Number of nodes

Same

None of above

**Ans:**

Message size

8. The gather operation is exactly the \_ of the scatter operation

Inverse

Reverse

Multiple

Same

**Ans:**

Inverse

9. The gather operation is exactly the inverse of the\_

- Scatter operation
- Broadcast operation
- Prefix Sum
- Reduction operation

**Ans:**

Scatter operation

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10. The dual of one-to-all broadcast is all-to-one reduction. True or False?

- TRUE
- FALSE

**Ans:**

TRUE

11. A binary tree in which processors are (logically) at the leaves and internal nodes are routing nodes.

- TRUE
  - FALSE
- Ans:**
- TRUE

12. Group communication operations are built using point-to-point messaging primitives

- TRUE
  - FALSE
- Ans:**
- TRUE

13. Communicating a message of size m over an uncongested network takes time  $ts + tmw$

- True
  - False
- Ans:**
- True

14. Parallel programs: 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?

- Infinite speedup
  - 5
  - 20
  - None of above
- Ans:**
- 20

15. Shift register that performs a circular shift is called

Invalid Counter

Valid Counter

Ring

Undefined

**Ans:**

Ring

16. 8 bit information can be stored in

2 Registers

4 Registers

6 Registers

8 Registers

**Ans:**

8 Registers

17. The result of prefix expression  $* / b + - d a c d$ , where  $a = 3, b = 6, c = 1, d = 5$  is

0

5

10

8

**Ans:**

10

18. The height of a binary tree is the maximum number of edges in any root to leaf path. The maximum number of nodes in a binary tree of height  $h$  is?

$2h - 1$

$2h - 1 - 1$

$2h + 1 - 1$

$2 * (h+1)$

**Ans:**

$2h + 1 - 1$

19. A hypercube has\_

$2^d$  nodes

2d nodes

2n Nodes

N Nodes

**Ans:**

$2^d$  nodes

Parallel computing mcq with answers

20. The Prefix Sum Operation can be implemented using the\_

All-to-all broadcast kernel

All-to-one broadcast kernel

One-to-all broadcast Kernel

Scatter Kernel

**Ans:**

All-to-all broadcast kernel

21. In the scatter operation\_

Single node send a unique message of size m to every other node

Single node send a same message of size m to every other node

Single node send a unique message of size m to next node

None of Above

**Ans:**

Single node send a unique message of size m to every other node

22. In All-to-All Personalized Communication Each node has a distinct message of size m for every other node

True

False

**Ans:**

True

23. A binary tree in which processors are (logically) at the leaves and internal nodes are routing nodes.

True

False

**Ans:**

True

24. In All-to-All Broadcast each processor is the source as well as destination.

True

False

**Ans:**

True

---

## UNIT 4

---

1. mathematically efficiency is

$$e=s/p$$

$$e=p/s$$

$$e^*s=p/2$$

$$e=p+e/e$$

**Ans:**

$$e=s/p$$

2. Cost of a parallel system is sometimes referred to\_\_\_\_ of product

work  
processor time  
both  
none  
**Ans:**  
both

3. Scaling Characteristics of Parallel Programs Ts is

increase  
constant  
decreases  
none  
**Ans:**  
constant

4. Speedup tends to saturate and efficiency \_ as a consequence of Amdahl's law.

increase  
constant  
decreases  
none  
**Ans:**  
decreases

5. Speedup obtained when the problem size is \_\_\_\_\_ linearly with the number of processing elements.

increase  
constant  
decreases  
depend on problem size  
**Ans:**  
increase

6. The  $n \times n$  matrix is partitioned among n processors, with each processor storing complete \_\_\_ \_ of the matrix.

row  
column  
both  
depend on processor  
**Ans:**  
row

7. cost-optimal parallel systems have an efficiency of \_\_\_\_\_

1  
n  
logn  
complex  
**Ans:**

1

8. The  $n \times n$  matrix is partitioned among  $n^2$  processors such that each processor owns a \_ element

- n
  - 2n
  - single
  - double
- Ans:**  
single

9. how many basic communication operations are used in matrix vector multiplication

- 1
  - 2
  - 3
  - 4
- Ans:**  
3

10. In DNS algorithm of matrix multiplication it used

- 1d partition
  - 2d partition
  - 3d partition
  - both a,b
- Ans:**  
3d partition

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11. In the Pipelined Execution, steps contain

- normalization
  - communication
  - elimination
  - all
- Ans:**  
all

12. the cost of the parallel algorithm is higher than the sequential run time by a factor of \_\_

- 3/2
  - 2/3
  - 3\*2
  - 2/3+3/2
- Ans:**  
3/2

13. The load imbalance problem in Parallel Gaussian Elimination: can be alleviated by using a \_\_

mapping

acyclic  
cyclic  
both  
none  
**Ans:**  
acyclic

14. A parallel algorithm is evaluated by its runtime in function of

the input size,  
the number of processors,  
the communication parameters.  
all

**Ans:**  
all

15. For a problem consisting of  $W$  units of work,  $p \_\_ W$  processors can be used optimally

$\leq$   
 $\geq$   
 $<$   
 $>$

**Ans:**  
16.  $C(W) \_\_ \Theta(W)$  for optimality (necessary condition).

$>$   
 $<$   
 $\leq$   
equals  
**Ans:**  
equals

17. many interactions in practical parallel programs occur in \_\_\_\_ pattern

well defined  
zig-zac  
reverse  
straight  
**Ans:**  
well defined

18. efficient implementation of basic communication operation can improve

performance  
communication  
algorithm  
all  
**Ans:**  
performance

19. efficient use of basic communication operations can reduce

development effort

software quality

both

none

**Ans:**

development effort

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20. Group communication operations are built using \_\_\_\_\_ Messaging primitives.

point-to-point

one-to-all

all-to-one

none

**Ans:**

point-to-point

21. one processor has a piece of data and it need to send to everyone is

one -to-all

all-to-one

point -to-point

all of above

**Ans:**

one -to-all

22. wimpleat way to send  $p-1$  messages from source to the other  $p-1$  processors

Algorithm

communication

concurrency

receiver

**Ans:**

concurrency

23. In a eight node ring, node \_\_ is source of broadcast

1

2

8

0

**Ans:**

0

24. The processors compute \_\_ product of the vector element and the local matrix

local

global

both

none

**Ans:**

local

25. one to all broadcast use

recursive doubling

simple algorithm

both

none

**Ans:**

recursive doubling

26. In a broadcast and reduction on a balanced binary tree reduction is done in \_\_

recursive order

straight order

vertical order

parallel order

**Ans:**

recursive order

27. if "X" is the message to broadcast it initially resides at the source node

1

2

8

0

**Ans:**

0

28. logical operators used in algorithm are

XOR

AND

both

none

**Ans:**

both

29. Generalization of broadcast in Which each processor is

Source as well as destination

only source

only destination

none

**Ans:**

Source as well as destination

30. The algorithm terminates in \_\_ steps

p

p+1  
p+2  
p-1  
**Ans:**  
p-1

30. Each node first sends to one of its neighbours the data it need to....

broadcast  
identify  
verify  
none  
**Ans:**  
broadcast

30. The second communication phase is a columnwise \_\_ broadcast of consolidated

All-to-all  
one -to-all  
all-to-one  
point-to-point  
**Ans:**  
All-to-all

30. All nodes collects \_ message corresponding to  $\sqrt{p}$  nodes to their respectively

$\sqrt{p}$   
p  
p+1  
p-1  
**Ans:**  
 $\sqrt{p}$

30. It is not possible to port \_\_ for higher dimensional network

Algorithm  
hypercube  
both  
none  
**Ans:**  
Algorithm

30. If we port algorithm to higher dimemsional network it would cause

error  
contention  
recursion  
none  
**Ans:**  
contention

30. In the scatter operation \_\_ node send message to every other node

- single
  - double
  - triple
  - none
- Ans:**  
single

30. The gather Operation is exactly the inverse of \_

- scatter operation
  - recursion operation
  - execution
  - none
- Ans:**  
scatter operation

30. Similar communication pattern to all-to-all broadcast except in the\_\_\_\_\_

- reverse order
  - parallel order
  - straight order
  - vertical order
- Ans:**  
reverse order

---

## UNIT 5

---

1. In \_\_, the number of elements to be sorted is small enough to fit into the process's main memory.

- internal sorting
  - internal searching
  - external sorting
  - external searching
- Ans:**  
internal sorting

2. \_\_ algorithms use auxiliary storage (such as tapes and hard disks) for sorting because the number of elements to be sorted is too large to fit into memory.

- internal sorting
  - internal searching
  - External sorting
  - external searching
- Ans:**  
External sorting

3. \_\_ can be comparison-based or noncomparison-based.

searching  
Sorting  
both a and b  
none of above

**Ans:**

Sorting

4. The fundamental operation of comparison-based sorting is \_\_

compare-exchange  
searching  
Sorting  
swapping

**Ans:**

compare-exchange

5. The complexity of bubble sort is  $\Theta(n^2)$

TRUE  
FALSE  
**Ans:**  
TRUE

6. Bubble sort is difficult to parallelize since the algorithm has no concurrency.

TRUE  
FALSE  
**Ans:**  
TRUE

7. Quicksort is one of the most common sorting algorithms for sequential computers because of its simplicity, low overhead, and optimal average complexity.

TRUE  
FALSE  
**Ans:**  
TRUE

8. The performance of quicksort depends critically on the quality of the \_\_

non-pivot  
pivot  
center element  
len of array  
**Ans:**  
pivot

9. the complexity of quicksort is  $O(n \log n)$

TRUE

FALSE

**Ans:**

TRUE

10. DFS begins by expanding the initial node and generating its successors. In each subsequent step, DFS expands one of the most recently generated nodes.

TRUE

FALSE

**Ans:**

TRUE

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11. The main advantage of \_\_ is that its storage requirement is linear in the depth of the state space being searched.

BFS

DFS

a and b

none of above

**Ans:**

DFS

12. \_\_ algorithms use a heuristic to guide search.

BFS

DFS

a and b

none of above

**Ans:**

BFS

13. If the heuristic is admissible, the BFS finds the optimal solution.

TRUE

FALSE

**Ans:**

TRUE

14. The search overhead factor of the parallel system is defined as the ratio of the work done by the parallel formulation to that done by the sequential formulation

TRUE

FALSE

**Ans:**

TRUE

15. The critical issue in parallel depth-first search algorithms is the distribution of the search space among the processors.

TRUE

FALSE

**Ans:**

TRUE

16. Graph search involves a closed list, where the major operation is a \_

sorting

searching

lookup

none of above

**Ans:**

lookup

17. Breadth First Search is equivalent to which of the traversal in the Binary Trees?

Pre-order Traversal

Post-order Traversal

Level-order Traversal

In-order Traversal

**Ans:**

Level-order Traversal

18. Time Complexity of Breadth First Search is? (V – number of vertices, E – number of edges)

$O(V + E)$

$O(V)$

$O(E)$

$O(V^*E)$

**Ans:**

$O(V + E)$

19. Which of the following is not an application of Breadth First Search?

When the graph is a Binary Tree

When the graph is a Linked List

When the graph is a n-ary Tree

When the graph is a Ternary Tree

**Ans:**

When the graph is a Linked List

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20. In BFS, how many times a node is visited?

Once

Twice

Equivalent to number of indegree of the node

Thrice

**Ans:**

Equivalent to number of indegree of the node

21. Is Best First Search a searching algorithm used in graphs.

TRUE

FALSE

**Ans:**

TRUE

22. The critical issue in parallel depth-first search algorithms is the distribution of the search space among the processors.

TRUE

FALSE

**Ans:**

TRUE

23. Graph search involves a closed list, where the major operation is a \_

sorting

searching

lookup

none of above

**Ans:**

lookup

24. Which of the following is not a stable sorting algorithm in its typical implementation.

Insertion Sort

Merge Sort

Quick Sort

Bubble Sort

**Ans:**

Quick Sort

25. Which of the following is not true about comparison based sorting algorithms?

The minimum possible time complexity of a comparison based sorting algorithm is  $O(n \log n)$  for a random input array

Any comparison based sorting algorithm can be made stable by using position as a criteria when two elements are compared

Counting Sort is not a comparison based sorting algorithm

Heap Sort is not a comparison based sorting algorithm.

**Ans:**

Heap Sort is not a comparison based sorting algorithm.

---

## UNIT 6

---

1. A CUDA program is comprised of two primary components: a host and a \_

GPU kernel

CPU kernel

OS

none of above

**Ans:**

GPU kernel

2. The kernel code is identified by the \_\_\_\_\_ qualifier with void return type

\_host\_  
\_global\_  
\_device\_

void

**Ans:**

\_global\_

3. The kernel code is only callable by the host

TRUE

FALSE

**Ans:**

TRUE

4. The kernel code is executable on the device and host

TRUE

FALSE

**Ans:**

FALSE

5. Calling a kernel is typically referred to as \_

kernel thread  
kernel initialization  
kernel termination  
kernel invocation

**Ans:**

kernel invocation

6. Host codes in a CUDA application can Initialize a device

TRUE

FALSE

**Ans:**

TRUE

7. Host codes in a CUDA application can Allocate GPU memory

TRUE

FALSE

**Ans:**

TRUE

8. Host codes in a CUDA application can not Invoke kernels

TRUE  
FALSE

**Ans:**  
FALSE

9. CUDA offers the Chevron Syntax to configure and execute a kernel.

TRUE  
FALSE

**Ans:**  
TRUE

10. the BlockPerGrid and ThreadPerBlock parameters are related to the \_\_ model supported by CUDA.

host  
kernel  
thread abstraction  
none of above

**Ans:**  
thread abstraction

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11. \_\_ is Callable from the device only

\_host\_  
\_\_global\_\_  
\_device\_  
none of above

**Ans:**  
\_device\_

12. \_\_ is Callable from the host

\_\_global\_\_  
\_device\_  
none of above

**Ans:**  
\_\_global\_\_

13. CUDA supports \_\_ in which code in a single thread is executed by all other threads.

tread division  
tread termination  
thread abstraction  
none of above

**Ans:**  
thread abstraction

14. In CUDA, a single invoked kernel is referred to as a \_\_

block  
tread  
grid  
none of above

**Ans:**  
grid

15. A grid is comprised of \_\_ of threads.

block  
bunch  
host  
none of above

**Ans:**  
block

16. Host codes in a CUDA application can not Reset a device

TRUE  
FALSE  
**Ans:**  
FALSE

17. A block is comprised of multiple \_

treads  
bunch  
host  
none of above

**Ans:**  
treads

18. a solution of the problem in representing the parallelism in algorithm is

CUD  
PTA  
CDA  
CUDA

**Ans:**  
CUDA

19. Host codes in a CUDA application can Transfer data to and from the device

TRUE  
FALSE  
**Ans:**  
TRUE

20. Host codes in a CUDA application can not Deallocate memory on the GPU

TRUE  
FALSE  
**Ans:**  
FALSE

---

Question 1 : The need for parallel processor to increase speedup

1. Moores Law
2. Minsky conjecture
3. Flynn's Law
4. Amdahl's Law

ANSWER  
**Amdahl's Law**

---

Question 2 : Which of the following interrupt is non maskable

1. INTR
2. RST 7.5
3. RST 6.5
4. TRAP

ANSWER

---

Question 3 : In which system desire HPC

1. Adaptivity
2. Transparency
3. Dependency
4. Secretivity

ANSWER  
**Transparency**

---

Question 4 : When every cache hierarchy level is subset of level which further away from the processor

1. Synchronous
2. Atomic synchronous
3. Distributors

4. Multilevel inclusion

ANSWER

Multilevel inclusion

---

Question 5 : . \_\_\_\_\_ leads to concurrency

1. Serialization
2. cloud computing
3. Distribution
4. Parallelism

ANSWER

Parallelism

---

Question 6 : The problem where process concurrency becomes an issue is called as \_\_\_\_\_

1. Reader-write problem
2. Bankers problem
3. Bakery problem
4. Philosophers problem

ANSWER

Reader-write problem

---

Question 7 : Interprocess communication that take place

1. Centralized memory
2. Message passing
3. shared memory
4. cache memory

ANSWER

shared memory

---

Question 8 : Speedup can be as low as\_\_\_\_

1. 1
2. 2
3. 0
4. 3

**ANSWER**

0

---

Question 9 : A type of parallelism that uses micro architectural techniques.

1. bit based
2. bit level
3. increasing
4. instructional

**ANSWER**

instructional

---

Question 10 : MPI\_Comm\_size

1. Returns number of processes
2. Returns number of line
3. Returns size of program
4. Returns value of instruction

**ANSWER**

Returns number of processes

---

Question 11 : High performance computing of the computer system tasks are done by

1. node clusters
2. network clusters
3. Beowulf clusters
4. compute nodes

**ANSWER**

compute nodes

---

Question 12 : MPI\_Comm\_rank

1. returns rank
2. returns processes
3. returns value
4. Returns value of instruction

**ANSWER**

returns rank

---

Question 13 : A processor performing fetch or decoding of different instruction during the execution of another instruction is called \_\_\_\_\_ .

- 1. Super-scaling
- 2. Pipe-lining
- 3. Parallel Computation
- 4. distributed

ANSWER

Pipe-lining

---

Question 14 : Any condition that causes a processor to stall is called as \_\_\_\_\_

- 1. page fault
- 2. system error
- 3. Hazard
- 4. execution error

ANSWER

Hazard

---

Question 15 : Characteristic of RISC (Reduced Instruction Set Computer) instruction set is

- 1. one word instruction
- 2. two word instruction
- 3. three word instruction
- 4. four word instruction

ANSWER

one word instruction

---

Question 16 : The disadvantage of using a parallel mode of communication is \_\_\_\_\_

- 1. Leads to erroneous data transfer
- 2. It is costly
- 3. Security of data
- 4. complexity of network

ANSWER

It is costly

---

Question 17 : A microprogram sequencer

1. generates the address of next micro instruction to be executed.
2. generates the control signals to execute a microinstruction.
3. sequentially averages all microinstructions in the control memory.
4. enables the efficient handling of a micro program subroutine.

ANSWER

---

Question 18 : The \_\_\_ time collectively spent by all the processing elements  $T_{all} = p \cdot TP$

1. total
2. Average
3. mean
4. sum

ANSWER

total

---

Question 19 : In a distributed computing environment, distributed shared memory is used which is \_\_\_\_\_

1. Logical combination of virtual memories on the nodes
2. Logical combination of physical memories on the nodes
3. Logical combination of the secondary memories on all the nodes
4. Logical combinatin of files

ANSWER

---

Question 20 : The average number of steps taken to execute the set of instructions can be made to be less than one by following \_\_\_\_\_ .

1. Sequential
2. super-scaling
3. pipe-lining
4. ISA

ANSWER

super-scaling

---

Question 21 : The main difference between the VLIW and the other approaches to improve performance is \_\_\_\_\_

1. increase in performance
2. Lack of complex hardware design
3. Cost effectiveness
4. latency

ANSWER

Lack of complex hardware design

---

Question 22 : CISC stands for

1. Complete Instruction Sequential Compilation
2. Complete Instruction Sequential Compiler
3. Complete Instruction Serial Compilation
4. Complex Instruction set computer

ANSWER

complex

---

Question 23 : Speedup, in theory, should be \_\_\_\_\_ bounded by p

1. lower
2. upper
3. left
4. right

ANSWER

upper

---

Question 24 : Virtualization that creates one single address space architecture that of, is called

1. Loosely coupled
2. Space based
3. Tightly coupled
4. peer-to-peer

ANSWER

Space based

---

Question 25 : MPI\_Init

1. Close MPI environment
2. Initialize MPI environment
3. start programming
4. Call processes

ANSWER

**start programming**

---

Question 26 : Content of the program counter is added to the address part of the instruction in order to obtain the effective address is called

1. relative address mode
2. index addressing mode
3. register mode
4. implied mode

ANSWER

---

Question 27 : The straight-forward model used for the memory consistency, is called

1. Sequential consistency
2. Random consistency
3. Remote node
4. Host node

ANSWER

---

Question 28 : Which MIMD systems are best scalable with respect to the number of processors

1. Distributed memory
2. ccNUMA
3. nccNUMA
4. Symmetric multiprocessor

ANSWER

**Distributed memory**

---

Question 29 : Memory management on a multiprocessor must deal with all of found on

1. Uniprocessor Computer

- 2. Computer
- 3. Processor
- 4. System

ANSWER

---

Question 30 : The \_\_\_ time collectively spent by all the processing elements  $T_{all} = p \cdot TP$

- 1. total
- 2. sum
- 3. average
- 4. product

ANSWER

total

Question 31 : Hazard are eliminated through renaming by renaming all

- 1. Source register
- 2. Memory
- 3. Data
- 4. Destination register

ANSWER

Destination register

Question 32 : The situation wherein the data of operands are not available is called \_\_\_\_\_

- 1. stock
- 2. Deadlock
- 3. data hazard
- 4. structural hazard

ANSWER

data hazard

Question 33 : types of HPC application

- 1. Mass Media
- 2. Business
- 3. Management

4. Science

ANSWER

Science

---

Question 34 : A distributed operating system must provide a mechanism for

1. intraprocessor communication
2. intraprocess and intraprocessor communication
3. interprocess and interprocessor communication
4. interprocessor communication

ANSWER

---

Question 35 : This is computation not performed by the serial version

1. Serial computation
2. Excess computation
3. serial computation
4. parallel computing

ANSWER

---

Question 36 : The important feature of the VLIW is \_\_\_\_\_

1. ILP
2. Performance
3. Cost effectiveness
4. delay

ANSWER

ILP

---

Question 37 : The tightly coupled set of threads execution working on a single task ,that is called

1. Multithreading
2. Parallel processing
3. Recurrence
4. Serial processing

**ANSWER**

Multithreading

---

Question 38 : Parallel Algorithm Models

1. Data parallel model
2. Bit model
3. Data model
4. network model

**ANSWER**

Data parallel model

---

Question 39 : Mpi\_Recv used for

1. reverse message
2. receive message
3. forward message
4. Collect message

**ANSWER**

receive message

---

Question 40 : Status bit is also called

1. Binary bit
2. Flag bit
3. Signed bit
4. Unsigned bit

**ANSWER**

---

Question 41 : For inter processor communication the miss arises are called

1. hit rate
2. coherence misses
3. comitt misses
4. parallel processing

**ANSWER**

coherence misses

---

Question 42 : The interconnection topologies are implemented using \_\_\_\_\_ as a node.

- 1. control unit
- 2. microprocessor
- 3. processing unit
- 4. microprocessor or processing unit

ANSWER

---

Question 43 : \_\_\_\_\_ gives the theoretical speedup in latency of the execution of a task at fixed execution time

- 1. Amdahl's
- 2. Moor's
- 3. metcalfe's
- 4. Gustafson's law

ANSWER

Gustafson's law

---

Question 44 : The number and size of tasks into which a problem is decomposed determines the

- 1. fine-grainularity
- 2. coarse-grainularity
- 3. sub Task
- 4. granularity

ANSWER

granularity

---

Question 45 : MPI\_Finalize used for

- 1. Stop mpi environment program
- 2. intitalise program
- 3. Include header files
- 4. program start

ANSWER

Stop mpi environment program

---

Question 46 : Private data that is used by a single processor then shared data are used

1. Single processor
2. Multi processor
3. Single tasking
4. Multi tasking

ANSWER

Single processor

---

Question 47 : The time lost due to the branch instruction is often referred to as \_\_\_\_\_

1. Delay
2. Branch penalty
3. Latency
4. control hazard

ANSWER

Branch penalty

---

Question 48 : NUMA architecture uses \_\_\_\_\_ in design

1. cache
2. shared memory
3. message passing
4. distributed memory

ANSWER

distributed memory

---

Question 49 : Divide and Conquer approach is known for

1. Sequential algorithm development
2. parallel algorithm development
3. Task defined algorithm
4. Non defined Algorithm

ANSWER

Sequential algorithm development

---

Question 50 : The parallelism across branches require which scheduling

1. Global scheduling
2. Local Scheduling
3. post scheduling
4. pre scheduling

ANSWER

Global scheduling

---

Question 51 : Parallel processing may occur

1. In the data stream
2. In instruction stream
3. In network
4. In transferring

ANSWER

In the data stream

---

Question 52 : Pipe-lining is a unique feature of \_\_\_\_\_.

1. CISC
2. RISC
3. ISA
4. IANA

ANSWER

RISC

---

Question 53 : In MPI programming MPI\_char is the instruction for

1. Unsigned Char
2. Sign character
3. Long Char
4. unsigned long char

ANSWER

Sign Char

---

Question 54 : To increase the speed of memory access in pipelining, we make use of \_\_\_\_\_

1. Special memory locations
2. Special purpose registers

- 3. Cache
- 4. Buffer

ANSWER

buffer

---

Question 55 : If the value  $V(x)$  of the target operand is contained in the address field itself, the addressing mode is

- 1. Immediate
- 2. Direct
- 3. Indirect
- 4. Implied

ANSWER

---

Question 56 : In a multi-processor configuration two coprocessors are connected to host 8086 processor. The instruction sets of the two coprocessors

- 1. must be same
- 2. may overlap
- 3. must be disjoint
- 4. must be the same as that of host

ANSWER

---

Question 57 : A feature of a task-dependency graph that determines the average degree of concurrency for a given granularity is its \_\_\_\_\_ path

- 1. critical
- 2. easy
- 3. difficult
- 4. ambiguous

ANSWER

critical

---

Question 58 : MPI\_send used for

- 1. collect message

- 2. transfer message
- 3. send message
- 4. receive message

ANSWER

send message

---

Question 59 : What is usually regarded as the von Neumann Bottleneck

- 1. Instruction set
- 2. Arithmetic logical unit
- 3. Processor/memory interface
- 4. Control unit

ANSWER

Arithmetic logical unit

---

Question 60 : An interface between the user or an application program, and the system resources is

- 1. Microprocessor
- 2. Microcontroller
- 3. Multimicroprocessor
- 4. operating system

ANSWER

-----

---

Question 61 : The computer architecture aimed at reducing the time of execution of instructions is \_\_\_\_\_.

- 1. CISC
- 2. RISC
- 3. SPARC
- 4. ISA

ANSWER

RISC

---

Question 62 : parallel computer is capable of

- 1. Decentralized computing

2. Parallel computing
3. Distributed computing
4. centralized computing

ANSWER

---

Question 63 : Design of \_\_\_\_\_ processor is complex

1. parallel
2. pipeline
3. serial
4. distributed

ANSWER  
**pipeline**

---

Question 64 : The instructions which copy information from one location to another either in the processor's internal register set or in the external main memory are called

1. Data transfer instructions
2. Program control instructions
3. Input-output instructions
4. Logical instructions

ANSWER

---

Question 65 : The pattern of \_\_\_\_\_ among tasks is captured by what is known as a task-interaction graph

1. interaction
2. communication
3. optimization
4. flow

ANSWER  
**interaction**

---

Question 66 : In vector processor a single instruction, can ask for \_\_\_\_\_ data operations

1. multiple
2. single

- 3. two
- 4. four

ANSWER

multiple

---

Question 67 : The cost of a parallel processing is primarily determined by

- 1. switching complexity
- 2. circuit complexity
- 3. Time Complexity
- 4. space complexity

ANSWER

Time Complexity

---

Question 68 : Interaction overheads can be minimized by\_\_\_\_

- 1. Maximize Data Locality
- 2. Maximize Volume of data exchange
- 3. Increase Bandwidth
- 4. Minimize social media contents

ANSWER

Maximize Data Locality

---

Question 69 : This is computation not performed by the serial version

- 1. Excess Computation
- 2. serial computation
- 3. Parallel Computing
- 4. cluster computation

ANSWER

Excess Computation

---

Question 70 : The cost of dynamic networks is often determined by the number of  
\_\_\_\_\_ nodes in the network.

- 1. Packet
- 2. Ring
- 3. Static

#### 4. Switching

ANSWER

Switching

---

Question 71 : The contention for the usage of a hardware device is called \_\_\_\_\_

1. data hazard
2. Stalk
3. Deadlock
4. structural hazard

ANSWER

structural hazard

---

Question 72 : Which Algorithm is better choice for pipelining

1. Small Algorithm
2. Hash Algorithm
3. Merge-Sort Algorithm
4. Quick-Sort Algorithm

ANSWER

Merge-Sort Algorithm

---

Question 73 : In MPI programming MPI\_Reduce is the instruction for

1. Full operation
2. Limited operation
3. reduction operation
4. selected operation

ANSWER

reduction operation

---

Question 74 : The stalling of the processor due to the unavailability of the instructions is called as \_\_\_\_\_

1. Input hazard
2. data hazard
3. structural hazard
4. control hazard

**ANSWER**

**control hazard**

---

Question 75 : \_\_\_\_\_ processors rely on compile time analysis to identify and bundle together instructions that can be executed concurrently

1. VILW
2. LVIW
3. VLIW
4. VLWI

**ANSWER**

**VLIW**

---

Question 76 : type of parallelism that is naturally expressed by independent tasks in a task-dependency graph is called \_\_\_\_\_ parallelism.

1. Task
2. Instruction
3. Data
4. Program

**ANSWER**

**Task**

---

Question 77 : NSM has launched its first supercomputer at

1. BHU
2. IITB
3. IITKG
4. IITM

**ANSWER**

**BHU**

---

Question 78 : Writing parallel programs is referred to as

1. Parallel computation
2. parallel development
3. parallel programing
4. Parallel processing

**ANSWER**

Parallel computation

---

Question 79 : A processor performing fetch or decoding of different instruction during the execution of another instruction is called \_\_\_\_\_ .

1. Super-scaling
2. Pipe-lining
3. Parallel computation
4. serial computation

**ANSWER**

Pipe-lining

---

Question 80 : Zero address instruction format is used for

1. RISC architecture
2. CISC architecture
3. Von-Neuman architecture
4. Stack-organized architecture

**ANSWER**

---

Question 81 : An interface between the user or an application program, and the system resources are

1. microprocessor
2. microcontroller
3. multi-microprocessor
4. operating system

**ANSWER**

---

Question 82 : The main objective in building the multi-microprocessor is

1. greater throughput
2. enhanced fault tolerance
3. greater throughput and enhanced fault tolerance
4. zero throughput

**ANSWER**

---

Question 83 : UMA architecture uses \_\_\_\_\_ in design

1. cache
2. shared memory
3. message passing
4. distributed memory

**ANSWER**

shared memory

---

Question 84 : To which class of systems does the von Neumann computer belong

1. SIMD
2. MIMD
3. MISD
4. SISD

**ANSWER**

SISD

---

Question 85 : characteristic of CISC (Complex Instruction Set Computer)

1. Variable format instruction
2. Fixed format instructions
3. Instruction are executed by hardware
4. unsigned long char

**ANSWER**

Variable format instruction

---

Question 86 : A \_\_\_\_\_ computation performs one multiply-add on a single pair of vector elements

1. dot product
2. cross product
3. multiply
4. add

**ANSWER**

**dot**

---

Question 87 : Data parallelism is parallelism inherent in

1. program loops
2. Serial program
3. parallel program
4. long programs

**ANSWER**

**parallel program**

---

Question 88 : What is the execution time per stage of a pipeline that has 5 equal stages and a mean overhead of 12 cycles

1. 2 cycles
2. 3 cycles
3. 5 cycles
4. 4 cycles

**ANSWER**

**3 cycles**

---

Question 89 : This algorithm is called greedy because

1. the greedy algorithm never considers the same solution again
2. the greedy algorithm always give same solution again
3. the greedy algorithm never considers the optimal solution
4. the greedy algorithm never considers whole program

**ANSWER**

**the greedy algorithm never considers the same solution again**

---

Question 90 : If n is a power of two, we can perform this operation in \_\_\_\_\_ steps by propagating partial sums up a logical binary tree of processors.

1.  $\log n$
2.  $n \log n$
3. n
4.  $n^2$

**ANSWER**

**login**

Question 91 : A multiprocessor machine which is capable of executing multiple instructions on multiple data sets

1. SISD
2. SIMD
3. MIMD
4. MISD

**ANSWER**

**MIMD**

---

Question 92 : Tree networks suffer from a communication bottleneck at higher levels of the tree. This network, also called a \_\_\_\_\_ tree.

1. fat
2. binary
3. order static
4. heap tree

**ANSWER**

**FAT**

---

Question 93 : Multiple application independently running are typically called

1. Multiprogramming
2. multiithreading
3. Multitasking
4. Synchronization

**ANSWER**

**Multiprogramming**

---

Question 94 : Each of the clock cycle from the previous section of execution becomes

1. Previous stage
2. stall
3. previous cycle
4. pipe stage

**ANSWER**

## pipe stage

---

Question 95 : The main objective in building the multimicroprocessor is

1. greater throughput
2. enhanced fault tolerance
3. greater throughput and enhanced fault tolerance
4. none of the mentioned

## ANSWER

---

Question 96 : Waiting until there is no data hazards then

1. stall
2. write operand
3. Read operand
4. Branching

## ANSWER

Read operand

---

Question 97 : In message passing, send and receive message between

1. Task or processes
2. Task and Execution
3. Processor and Instruction
4. Instruction and decode

## ANSWER

Task or processes

---

Question 98 : We denote the serial runtime by TS and the parallel\_\_\_\_by TP

1. runtime
2. clock time
3. processor time
4. clock frequency

## ANSWER

runtime

---

Question 99 : Uniprocessor computing devices is called \_\_\_\_\_.

1. Grid computing
2. Centralized computing
3. Parallel computing
4. Distributed computing

ANSWER

Centralized computing

---

Question 100 : The tightly coupled set of threads execution working on a single task is called

1. Serial processing
2. parallel processing
3. Multithreading
4. Recurrent

ANSWER

Multithreading

---

Question 101 : what is WAR

1. Write before read
2. write after write
3. write after read
4. write with read

ANSWER

write after read

---

Question 102 : Partitioning refer to decomposing of the computational activity as

1. Small Task
2. Large Task
3. Full program
4. group of program

ANSWER

Small Task

---

Question 103 : Speed up is defined as a ratio of

1.  $s = T_s / T_p$
2.  $S = T_p / T_s$
3.  $T_s = S / T_p$
4.  $T_p = S / T_s$

ANSWER

**s=T<sub>s</sub>/T<sub>p</sub>**

---

Question 104 : A processor that continuously tries to acquire the locks, spinning around a loop till it reaches its success, is known as

1. Spin locks
2. Store locks
3. Link locks
4. Store operational

ANSWER

---

Question 105 : Pipelining strategy is called implement

1. Instruction execution
2. Instruction prefetch
3. Instruction manipulation
4. instruction decoding

ANSWER

**Instruction prefetch**

---

Question 106 : Parallel computing means to divide the job into several \_\_\_\_\_

1. Bit
2. Data
3. Instruction
4. Task

ANSWER

**Task**

---

Question 107 : if a piece of data is repeatedly used, the effective latency of this memory system can be reduced by the \_\_\_\_\_.

1. RAM
2. ROM
3. Cache
4. HDD

ANSWER

Cache

---

Question 108 : Processing of multiple tasks simultaneously on multiple processors is called

1. Parallel processong
2. Distributed processing
3. Uni- processing
4. Multi-processing

ANSWER

Multi-processing

---

Question 109 : The instruction execution sequence ,that holds the instruction result known as

1. Data buffer
2. control buffer
3. reorder buffer
4. ordered buffer

ANSWER

reorder buffer

---

Question 110 : A multiprocessor operating system must take care of

1. authorized data access and data protection
2. unauthorized data access and data protection
3. authorized data access
4. data protection

ANSWER

---

Question 111 : The expression 'delayed load' is used in context of

1. prefetching
2. pipelining

- 3. processor-printer communication
- 4. memory-monitor communication

ANSWER

pipelining

---

Question 112 : \_\_\_\_\_ is a method for inducing concurrency in problems that can be solved using the divide-and-conquer strategy.

- 1. exploratory decomposition
- 2. speculative decomposition
- 3. data-decomposition
- 4. Recursive decomposition

ANSWER

data-decomposition

---

Question 113 : If no node having a copy of a cache block, this technique is known as

- 1. Uniform memory access
- 2. Cached
- 3. Un-cached
- 4. Commit

ANSWER

---

1: Computer system of a parallel computer is capable of

- A. Decentralized computing
- B. Parallel computing
- C. Centralized computing
- D. Decentralized computing
- E. Distributed computing
- F. All of these
- G. None of these

**Ans :**

A

2: Writing parallel programs is referred to as

- A. Parallel computation
- B. Parallel processes

- C. Parallel development
- D. Parallel programming
- E. Parallel computation
- F. All of these
- G. None of these

**Ans :**

D

3: Simplifies application's of three-tier architecture is \_\_\_\_\_.

- A. Maintenance
- B. Initiation
- C. Implementation
- D. Deployment
- E. All of these
- F. None of these

**Ans :**

D

4: Dynamic networks of networks, is a dynamic connection that grows is called

- A. Multithreading
- B. Cyber cycle
- C. Internet of things
- D. Cyber-physical system
- E. All of these
- F. None of these

**Ans :**

C

5: In which application system Distributed systems can run well?

- A. HPC
- D. HTC
- C. HRC
- D. Both A and B
- E. All of these
- F. None of these

**Ans :**

D

6: In which systems desire HPC and HTC.

- A. Adaptivity
- B. Transparency
- C. Dependency
- D. Secretive
- E. Adaptivity
- F. All of these
- G. None of these

**Ans :**

B

7: No special machines manage the network of architecture in which resources are known as

- A. Peer-to-Peer
- B. Space based
- C. Tightly coupled
- D. Loosely coupled
- E. All of these
- F. None of these

**Ans :**

A

8: Significant characteristics of Distributed systems have of

- A. 5 types
- B. 2 types
- C. 3 types
- D. 4 types
- E. All of these
- F. None of these

**Ans :**

C

9: Built of Peer machines are over

- A. Many Server machines
- B. 1 Server machine
- C. 1 Client machine
- D. Many Client machines
- E. All of these
- F. None of these

**Ans :**

D

10: Type HTC applications are

- A. Business
- B. Engineering
- C. Science
- D. Media mass
- E. All of these
- F. None of these

**Ans :**

**A**

11: Virtualization that creates one single address space architecture that of, is called

- A. Loosely coupled
- B. Peer-to-Peer
- C. Space-based
- D. Tightly coupled
- E. Loosely coupled
- F. All of these
- G. None of these

**Ans :**

**C**

12: We have an internet cloud of resources In cloud computing to form

- A. Centralized computing
- B. Decentralized computing
- C. Parallel computing
- D. Both A and B
- E. All of these
- F. None of these

**Ans :**

**E**

13: Data access and storage are elements of Job throughput, of \_\_\_\_\_.

- A. Flexibility
- B. Adaptation
- C. Efficiency
- D. Dependability
- E. All of these
- F. None of these

**Ans :**

**C**

14: Billions of job requests is over massive data sets, ability to support known as

- A. Efficiency
- B. Dependability
- C. Adaptation
- D. Flexibility
- E. All of these
- F. None of these

**Ans :**

**C**

15: Broader concept offers Cloud computing .to select which of the following.

- A. Parallel computing
- B. Centralized computing
- C. Utility computing
- D. Decentralized computing
- E. Parallel computing
- F. All of these
- G. None of these

**Ans :**

C

16: Resources and clients transparency that allows movement within a system is called

- A. Mobility transparency
- B. Concurrency transparency
- C. Performance transparency
- D. Replication transparency
- E. All of these
- F. None of these

**Ans :**

A

17: Distributed program in a distributed computer running a is known as

- A. Distributed process
- B. Distributed program
- C. Distributed application
- D. Distributed computing
- E. All of these
- F. None of these

**Ans :**

B

18: Uniprocessor computing devices is called\_\_\_\_\_.

- A. Grid computing
- B. Centralized computing
- C. Parallel computing
- D. Distributed computing
- E. All of these
- F. None of these

**Ans :**

B

19: Utility computing focuses on a\_\_\_\_\_ model.

- A. Data

- B. Cloud
- C. Scalable
- D. Business
- E. All of these
- F. None of these

**Ans :**

D

20: what is a CPS merges technologies

- A. 5C
- B. 2C
- C. 3C
- D. 4C
- E. All of these
- F. None of these

**Ans :**

C

21: Aberavationn of HPC

- A. High-peak computing
- B. High-peripheral computing
- C. High-performance computing
- D. Highly-parallel computing
- E. All of these
- F. None of these

**Ans :**

C

22: Peer-to-Peer leads to the development of technologies like

- A. Norming grids
- B. Data grids
- C. Computational grids
- D. Both A and B
- E. All of these
- F. None of these

**Ans :**

D

23: Type of HPC applications of.

- A. Management
- B. Media mass
- C. Business
- D. Science
- E. All of these
- F. None of these

**Ans :**

D

24: The development generations of Computer technology has gone through

- A. 6
- B. 3
- C. 4
- D. 5
- E. All of these
- F. None of these

**Ans :**

D

25: Utilization rate of resources in an execution model is known to be its

- A. Adaptation
- B. Efficiency
- C. Dependability
- D. Flexibility
- E. All of these
- F. None of these

**Ans :**

B

26: Even under failure conditions Providing Quality of Service (QoS) assurance is the responsibility of

- A. Dependability
- B. Adaptation
- C. Flexibility
- D. Efficiency
- E. All of these
- F. None of these

**Ans :**

A

27: Interprocessor communication that takes place

- A. Centralized memory
- B. Shared memory
- C. Message passing
- D. Both A and B
- E. All of these
- F. None of these

**Ans :**

D

28: Data centers and centralized computing covers many and

- A. Microcomputers
- B. Minicomputers
- C. Mainframe computers
- D. Supercomputers
- E. All of these
- F. None of these

**Ans :**

D

29: Which of the following is an primary goal of HTC paradigm\_\_\_\_\_.

- A. High ratio Identification
- B. Low-flux computing
- C. High-flux computing
- D. Computer utilities
- E. All of these
- F. None of these

**Ans :**

C

30: The high-throughput service provided is measures taken by

- A. Flexibility
- B. Efficiency
- C. Adaptation
- D. Dependability
- E. All of these
- F. None of these

**Ans :**

D

---

A modem is very helpful to link up two computers with the help of?

- (A). telephone line
- (B). dedicated line
- (C). All of these
- (D). None of these

**Ans : (C)**

A whole micro-computer system consists of which of the following?

- (A). microprocessor
- (B). memory
- (C). peripheral equipment
- (D). all of these
- (E). None of these

**Ans : (D).**

Which of the following program is a micro-program written in 0 and 1?

- (A). binary micro-program
- (B). binary microinstruction
- (C). symbolic microinstruction
- (D). Symbolic microinstruction
- (E). None of these

**Ans : A**

A pipeline is similar to which of the following?

- (A). a gas line
- (B). house pipeline
- (C). both a and b
- (D). an automobile assembly line
- (E). None of these

**Ans : D**

A processor performing fetching or decoding of instructions during the execution of another instruction is commonly known as?

- (A). Super-scaling
- (B). Parallel Computation
- (C). Pipe-lining
- (D). None of these

**Ans : D**

An optimizing compiler performs which of the following?

- (A). Better compilation of the given code.
- (B). better memory management.
- (C). Takes the benefit of processor type and decreases its process time.
- (D). Both a and c
- (E). None of these

**Ans : C**

Which of the following wires is a collection of lines that connects several devices?

- (A). internal wires
- (B). peripheral connection wires
- (C). Both a and b
- (D). bus
- (E). None of these

**Ans : (D).**

Which of the following is an instruction to give a small delay in the program?

- (A). NOP
- (B). LDA
- (C). BEA
- (D). None of these

**Ans : A**

How to define a peripheral?

- (A). any physical device connected to the computer
- (B). tape drive connected to a computer
- (C). any drives installed in the computer

(D). None of these

**Ans : A**

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<b>UNIT ONE</b>	<b>SUB : 410241 HPC</b>					
<b>Sr. No.</b>	<b>Questions</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>Answer</b>
1	A pipeline is like .....	an automobile assembly line	house pipeline	both a and b	a gas line	<b>a</b>
2	Data hazards occur when .....	Greater performance loss	Pipeline changes the order of read/write access to operands	Some functional unit is not fully pipelined	Machine size is limited	<b>b</b>
3	Systems that do not have parallel processing capabilities are	SISD	SIMD	MIMD	All of the above	<b>a</b>
4	How does the number of transistors per chip increase according to Moore 's law?	Quadratically	Linearly	Cubicly	Exponentially	<b>d</b>
5	Parallel processing may occur	in the instruction stream	B. in the data stream	both[A] and [B]	none of the above	<b>c</b>
6	Execution of several activities at the same time.	processing	parallel processing	serial processing	multitasking	<b>b</b>
7	Cache memory works on the principle of	Locality of data	Locality of memory	Locality of reference	Locality of reference & memory	<b>c</b>

8	SIMD represents an organization that _____.	refers to a computer system capable of processing several programs at the same time.	represents organization of single computer containing a control unit, processor unit and a memory unit.	includes many processing units under the supervision of a common control unit	none of the above.	<b>c</b>
9	A processor performing fetch or decoding of different instruction during the execution of another instruction is called _____.	Super-scaling	Pipe-lining	Parallel Computation	None of these	<b>b</b>
10	General MIMD configuration usually called	a multiprocessor	a vector processor	array processor	none of the above.	<b>a</b>
11	A Von Neumann computer uses which one of the following?	SISD	SIMD	MISD	MIMD.	<b>a</b>
12	MIMD stands for	Multiple instruction multiple data	Multiple instruction memory data	Memory instruction multiple data	Multiple information memory data	<b>a</b>
13	MIPS stands for:	Memory Instruction Per Second	Major Instruction Per Second	Main Information Per Second	Million Instruction Per Second	<b>d</b>
14	M.J. Flynn's parallel processing classification is based on:	Multiple Instructions	Multiple data	Both (a) and (b)	None of the above	<b>c</b>
15	VLIW stands for:	Vector Large Instruction Word	Very Long Instruction Word	Very Large Integrated Word	Very Low Integrated Word	<b>b</b>

16	The major disadvantage of pipeline is:	High cost individual dedicated	Initial setup time	If branch instruction is encountered the pipe has to be flushed	All of the above	<b>c</b>
17	A topology that involves Tokens.	Star	Ring	Bus	Daisy Chaining	<b>b</b>
18	multipoint topology is	bus	star	mesh	ring	<b>a</b>
19	In super-scalar mode, all the similar instructions are grouped and executed together.	TRUE	False			<b>a</b>
20	Which mechanism performs an analysis on the code to determine which data items may become unsafe for caching, and they mark those items accordingly?	Directory protocol	Snoopy protocol	Server based cache coherence	Compiler based cache coherence	<b>d</b>
21	How many processors can be organized in 5-dimensional binary hypercube system?	25	10	32	20	<b>c</b>
22	Multiprocessors are classified as _____.	SIMD	MIMD	SISD	MISD	<b>b</b>
23	Which of the following is not one of the interconnection structures?	Crossbar switch	Hypercube system	Single port memory	Time-shared common bus	<b>c</b>
24	Which combinational device is used in crossbar switch for selecting proper memory from multiple addresses?	Multiplexer	Decoder	Encoder	Demultiplexer	<b>a</b>

25	How many switch points are there in crossbar switch network that connects 9 processors to 6 memory modules?	50	63	60	54	<b>d</b>
26	In a three-cube structure, node 101 cannot communicate directly with node?	1	11	100	111	<b>b</b>
27	Which method is used as an alternative way of snooping-based coherence protocol?	Directory protocol	Memory protocol	Compiler based protocol	None of above	<b>a</b>
28	snoopy cache protocol are used in -----based system	bus	mesh	star	hypercube	<b>a</b>
29	superscalar architecture contains -----execution units for instruction execution	multiple	single	none of the above		<b>a</b>
30	time taken by header of a message between two directly connected nodes is called as-----	startup time	per hop time	per word transfer time	packaging time	<b>b</b>
31	the number of switch requirement for a network with n input and n output is -----	n	n <sup>2</sup>	n <sup>3</sup>	n <sup>4</sup>	<b>b</b>
32	which of the following is not static network	bus	ring	mesh	crossbar switch	<b>d</b>
33	In super-scalar processors, ----- mode of execution is used.	In-order	Post order	Out of order	None of the mentioned	<b>c</b>
34	----- have been developed specifically for pipelined systems.	Utility software	Speed up utilities	Optimizing compilers	None of the above	<b>c</b>

35	Which of the following is a combination of several processors on a single chip?	Multicore architecture	RISC architecture	CISC architecture	Subword parallelism	<b>a</b>
36	The important feature of the VLIW is .....	ILP	Cost effectiveness	performance	None of the mentioned	<b>a</b>
37	The parallel execution of operations in VLIW is done according to the schedule determined by .....	sk scheduler	Interpreter	Compiler	Encoder	<b>c</b>
38	The VLIW processors are much simpler as they do not require of .....	Computational register	Complex logic circuits	SSD slots	Scheduling hardware	<b>d</b>
39	The VLIW architecture follows ..... approach to achieve parallelism.	MISD	SISD	SIMD	MIMD	<b>d</b>
40	Which of the following is not a Pipeline Conflicts?	Timing Variations	Branching	Load Balancing	Data Dependency	<b>c</b>

<b>UNIT TWO</b>	<b>SUB : 410241 HPC</b>					
<b>Sr. No.</b>	<b>Questions</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>Answer</b>
1	Task dependency graph is -----	directed	undirected	directed acyclic	undirected acyclic	<b>c</b>
2	In task dependency graph longest directed path between any pair of start and finish node is called as -----	total work	critical path	task path	task length	<b>b</b>
3	which of the following is not a granularity type	course grain	large grain	medium grain	fine grain	<b>b</b>
4	which of the following is a an example of data decomposition	matrix multiplication	merge sort	quick sort	15 puzzal	<b>a</b>
5	which problems can be handled by recursive decomposition	backtracking	greedy method	divide and conquer problem	branch and bound	<b>c</b>
6	In this decomposition problem decomposition goes hand in hand with its execution	data decomposition	recursive decomposition	explorative decomposition	speculative decomposition	<b>c</b>
7	which of the following is not an example of explorative decomposition	n queens problem	15 puzzal problem	tic tac toe	quick sort	<b>d</b>
8	Topological sort can be applied to which of the following graphs?	a) Undirected Cyclic Graphs	b) Directed Cyclic Graphs	c) Undirected Acyclic Graphs	d) Directed Acyclic Graphs	<b>d</b>

9	In most of the cases, topological sort starts from a node which has _____	a) Maximum Degree b) Minimum Degree c) Any degree d) Zero Degree				<b>d</b>
10	Which of the following is not an application of topological sorting?	a) Finding prerequisite of a task b) Finding Deadlock in an Operating System c) Finding Cycle in a graph d) Ordered Statistics				<b>d</b>
11	In -----task are defined before starting the execution of the algorithm	dynamic task static task regular task one way task				<b>b</b>
12	which of the following is not the array distribution method of data partitioning	block cyclic block cyclic chunk				<b>d</b>
13	blocking optimization is used to improve temmporal locality for reduce	hit miss misses hit rate cache misses				<b>b</b>
14	CUDA thought that 'unifying theme' of every form of parallelism is	CDA thread PTA thread CUDA thread CUD thread				<b>c</b>
15	Topological sort of a Directed Acyclic graph is?	a) Always unique b) Always Not unique c) Sometimes unique and sometimes not unique d) Always unique if graph has even number of vertices				<b>c</b>
16	threads being block altogether and being executed in the sets of 32 threads called a	thread block 32 thread 32 block unit block				<b>a</b>
17	True or False: The threads in a thread block are distributed across SM units so that each thread is executed by one SM unit.	TRUE FALSE				<b>a</b>

18	When the topological sort of a graph is unique?	a) When there exists a hamiltonian path in the graph	b) In the presence of multiple nodes with indegree 0	c) In the presence of single node with indegree 0	d) In the presence of single node with outdegree 0	<b>a</b>
19	What is a high performance multi-core processor that can be used to accelerate a wide variety of applications using parallel computing.	CPU	DSP	GPU	CLU	<b>c</b>
20	A good mapping does not depends on which following factor	knowledge of task sizes	the size of data associated with tasks	characteristics of inter-task interactions	task overhead	<b>d</b>
21	CUDA is a parallel computing platform and programming model	TRUE	FALSE			<b>a</b>
22	Which of the following is <i>not</i> a form of parallelism supported by CUDA	Vector parallelism - Floating point computations are executed in parallel on wide vector units	Thread level task parallelism - Different threads execute a different tasks	Block and grid level parallelism - Different blocks or grids execute different tasks	Data parallelism - Different threads and blocks process different parts of data in memory	<b>a</b>
23	The style of parallelism supported on GPUs is best described as	MISD - Multiple Instruction Single Data	SIMT - Single Instruction Multiple Thread	SISD - Single Instruction Single Data	MIMD	<b>b</b>
24	True or false: Functions annotated with the <code>_global_</code> qualifier may be executed on the host or the device	TRUE	FALSE			<b>a</b>

25	Which of the following correctly describes a GPU kernel	A kernel may contain a mix of host and GPU code	All thread blocks involved in the same computation use the same kernel	A kernel is part of the GPU's internal micro-operating system, allowing it to act as an independent host	kernel may contain only host code	<b>b</b>
26	a code known as grid which runs on GPU consisting of a set of	32 thread	unit block	32 block	thread block	<b>d</b>
27	which of the following is not an parallel algorithm model	data parallel model	task graph model	task model	work pool model	<b>c</b>
28	Having load before the store in a running program order, then interchanging this order, results in a	WAW hazards	Destination registers	WAR hazards	Registers	<b>c</b>
29	model based on the passing of stream of data through process arranged in a succession is called as	producer consumer model	hybrid model	task graph model	work pool model	<b>a</b>
30	When instruction i and instruction j are tends to write the same register or the memory location, it is called	Input dependence	Output dependence	Ideal pipeline	Digital call	<b>b</b>
31	Multithreading allowing multiple-threads for sharing the functional units of a	Multiple processor	Single processor	Dual core	Corei5	<b>b</b>
32	Allowing multiple instructions for issuing in a clock cycle, is the goal of	Single-issue processors	Dual-issue processors	Multiple-issue processors	No-issue processors	<b>c</b>

33	OpenGL stands for:	A. Open General Liability	B. Open Graphics Library	C. Open Guide Line	D. Open Graphics Layer	<b>b</b>
34	which of the following is not an advantage of OpenGL	There is more detailed documentation for OpenGL while other API's don't have such detailed documentation.	OpenGL is portable.	OpenGL is more functional than any other API.	It is not a cross-platform API,	<b>d</b>
35	work pool model uses ----- approach for task assignment	static	dynamic	centralized	decentralized	<b>b</b>
36	which of the following is false regarding data parallel model	all task perform same computations	degree of parallelism increase with size of problem	matrix multiplication is example of data parallel	dynamic mapping is done	<b>d</b>
37	which of the following are methods for containing interaction overheads	maximizing data locality	minimize volume of data exchange	min frequency of interactions	all the above	<b>d</b>
38	which of the following are classes of dynamic mapping centralized method	self scheduling	chunk scheduling	both a and b	none of the above	<b>c</b>
39	which of the following is not scheme for static mapping	block distribution	block cyclic distributions	cyclic distributions	self scheduling	<b>d</b>

<b>UNIT THREE</b>	<b>SUB : 410241 HPC</b>					
<b>Sr. No.</b>	<b>Questions</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>Answer</b>
e.g 1	<b>Write down question</b>	<b>Option a</b>	<b>Option b</b>	<b>Option c</b>	<b>Option d</b>	<b>a/b/c/d</b>
1	Group communication operations are built using which primitives?	one to all	all to all	point to point	None of these	<b>c</b>
2	___ can be performed in an identical fashion by inverting the process.	Recursive Doubling	Reduction	Broadcast	None of these	<b>b</b>
3	Broadcast and reduction operations on a mesh is performed	along the rows	along the columns	both a and b concurrently	None of these	<b>c</b>
4	Cost Analysis on a ring is	$(ts + twm)(p - 1)$	$(ts - twm)(p + 1)$	$(tw + tsm)(p - 1)$	$(tw - tsm)(p + 1)$	<b>a</b>
5	Cost Analysis on a mesh is	$2ts(\sqrt{p} + 1) + twm(p - 1)$	$2tw(\sqrt{p} + 1) + tsm(p - 1)$	$2tw(\sqrt{p} - 1) + tsm(p - 1)$	$2ts(\sqrt{p} - 1) + twm(p - 1)$	<b>d</b>
6	Communication between two directly link nodes	Cut-through routing	Store-and-forward routing	Nearest neighbour communication	None	<b>c</b>
7	All-to-one communication (reduction) is the dual of ___ broadcast.	all-to-all	one-to-all	one-to-one	all-to-one	<b>b</b>
8	Which is known as Reduction?	all-to-one	all-to-all	one-to-one	one-to-all	<b>a</b>

9	Which is known as Broadcast?	one-to-one	one-to-all	all-to-all	all-to-one	<b>b</b>
10	The dual of all-to-all broadcast is	all-to-all reduction	all-to-one reduction	Both	None	<b>a</b>
11	All-to-all broadcast algorithm for the 2D mesh is based on the	Linear Array Algorithm	Ring algorithm	Both	None	<b>b</b>
12	In the first phase of 2D Mesh All to All, the message size is __	p	$m * \sqrt{p}$	m	$p * \sqrt{m}$	<b>c</b>
13	In the second phase of 2D Mesh All to All, the message size is __	m	$p * \sqrt{m}$	p	$m * \sqrt{p}$	<b>d</b>
14	In All to All on Hypercube, The size of the message to be transmitted at the next step is ___ by concatenating the received message with their current data	doubled	tripled	halved	no change	<b>a</b>
15	The all-to-all broadcast on Hypercube needs ___ steps	p	$\sqrt{p} - 1$	$\log p$	None	<b>c</b>
16	One-to-All Personalized Communication operation is commonly called __	gather operation	concatenation	scatter operation	None	<b>c</b>
17	The dual of the scatter operation is the	concatenation	gather operation	Both	None	<b>c</b>

18	In Scatter Operation on Hypercube, on each step, the size of the messages communicated is ____	tripled	halved	doubled	no change	<b>b</b>
19	Which is also called "Total Exchange" ?	All-to-all broadcast	All-to-all personalized communication	all-to-one reduction	None	<b>b</b>
20	All-to-all personalized communication can be used in ____	Fourier transform	matrix transpose	sample sort	all of the above	<b>d</b>
21	In collective communication operations, collective means	involve group of processors	involve group of algorithms	involve group of variables	none of these	<b>a</b>
22	efficiency of data parallel algorithm depends on the	efficient implementation of the algorithm	efficient implementation of the operation	both	none	<b>b</b>
23	All processes participate in a single ____ interaction operation.	global	local	wide	variable	<b>a</b>
24	subsets of processes in ____ interaction.	global	local	wide	variable	<b>b</b>
25	Goal of good algorithm is to implement commonly used ____ pattern.	communication	interaction	parallel	regular	<b>a</b>
26	Reduction can be used to find the sum, product, maximum, minimum of ____ of numbers.	tuple	list	sets	all of above	<b>c</b>
27	source ____ is bottleneck.	process	algorithm	list	tuple	<b>a</b>

28	only connections between single pairs of nodes are used at a time is	good utilization	poor utilization	massive utilization	medium utilization	<b>b</b>
29	all processes that have the data can send it again is	recursive doubling	naive approach	reduction	all	<b>a</b>
30	The ___ do not snoop the messages going through them.	nodes	variables	tuple	list	<b>a</b>
31	accumulate results and send with the same pattern is...	broadcast	naive approach	recursive doubling	reduction symmetric	<b>d</b>
32	every node on the linear array has the data and broadcast on the columns with the linear array algorithm in ____	parallel	vertical	horizontal	all	<b>a</b>
33	using different links every time and forwarding in parallel again is	better for congestion	better for reduction	better for communication	better for algorithm	<b>a</b>
34	In a balanced binary tree processing nodes is equal to	leaves	number of elemnts	branch	none	<b>a</b>
35	In one -to- all broadcast there is	divide and conquer type algorithm	sorting type algorithm	searching type algorithm	simple algorithm	<b>a</b>
36	For sake of simplicity, the number of nodes is a power of	1	2	3	4	<b>b</b>
37	Nides with zero in i least significant bits participate in ____	algorithm	broadcast	communication	searching	<b>c</b>

38	every node has to know when to communicate that is	call the procedure	call for broadcast	call for communication	call the congestion	<b>a</b>
39	the procedure is disturbed and require only point-to-point _____	synchronization	communication	both	none	<b>a</b>
40	Renaming relative to the source is _____ the source.	XOR	XNOR	AND	NAND	<b>a</b>

<b>UNIT FOUR</b>	<b>SUB : 410241 HPC</b>					
<b>Sr. No.</b>	<b>Questions</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>Answer</b>
e.g 1	<b>Write down question</b>	Option a	Option b	Option c	Option d	a/b/c/d
1	mathematically efficiency is	$e=s/p$	$e=p/s$	$e^*s=p/2$	$e=p+e/e$	<b>a</b>
2	Cost of a parallel system is sometimes referred to ___ of product	work	processor time	both	none	<b>c</b>
3	Scaling Characteristics of Parallel Programs Ts is	increase	constant	decreases	none	<b>b</b>
4	Speedup tends to saturate and efficiency ___ as a consequence of Amdahl's law.	increase	constant	decreases	none	<b>c</b>
5	Speedup obtained when the problem size is ___ linearly with the number of processing elements.	increase	constant	decreases	depend on problem size	<b>a</b>
6	The $n \times n$ matrix is partitioned among n processors, with each processor storing complete ___ of the matrix.	row	column	both	depend on processor	<b>a</b>
7	cost-optimal parallel systems have an efficiency of ___	1	n	logn	complex	<b>a</b>
8	The $n \times n$ matrix is partitioned among $n^2$ processors such that each processor owns a ___ element.	n	$2n$	single	double	<b>c</b>
9	how many basic communication operations are used in matrix vector multiplication	1	2	3	4	<b>c</b>
10	In DNS algorithm of matrix multiplication it used	1d partition	2d partition	3d partition	both a,b	<b>c</b>

11	In the Pipelined Execution, steps contain	normalization	communication	elimination	all	<b>d</b>
12	the cost of the parallel algorithm is higher than the sequential run time by a factor of __	3/2	2/3	3*2	2/3+3/2	<b>a</b>
13	The load imbalance problem in Parallel Gaussian Elimination: can be alleviated by using a ___ mapping	acyclic	cyclic	both	none	<b>b</b>
14	A parallel algorithm is evaluated by its runtime in function of	the input size,	the number of processors,	the communication parameters.	all	<b>d</b>
15	For a problem consisting of W units of work, p__W processors can be used optimally.	<=	>=	<	>	<b>a</b>
16	$C(W) \_\Theta(W)$ for optimality (necessary condition).	>	<	<=	equals	<b>d</b>
17	many interactions in practical parallel programs occur in ___ pattern	well defined	zig-zac	reverse	straight	<b>a</b>
18	efficient implementation of basic communication operation can improve	performance	communication	algorithm	all	<b>a</b>
19	efficient use of basic communication operations can reduce	development effort and	software quality	both	none	<b>a</b>
20	Group communication operations are built using ___ Messaging primitives.	point-to-point	one-to-all	all-to-one	none	<b>a</b>
21	one processor has a piece of data and it need to send to everyone is	one -to-all	all-to-one	point -to-point	all of above	<b>a</b>
22	the dual of one -to-all is	all-to-one reduction	one -to-all reduction	point -to-point reducption	none	<b>a</b>

23	Data items must be combined piece-wise and the result made available at _____	target processor finally	target variable finatly get receiver			<b>a</b>
24	wimpleat way to send p-1 messages from source to the other p-1 processors	Algorithm	communication	concurrency	receiver	<b>c</b>
25	In a eight node ring, node _____ is source of broadcast	1	2	8	0	<b>d</b>
26	The processors compute _____ product of the vector element and the loval matrix	local	global	both	none	<b>a</b>
27	one to all broadcast use	recursive doubling	simple algorithm	both	none	<b>a</b>
28	In a broadcast and reduction on a balanced binary tree reduction is done in _____	recursive order	straight order	vertical order	parallel order	<b>a</b>
29	if "X" is the message to broadcast it initially resides at the source node	1	2	8	0	<b>d</b>
30	logical operators used in algorithm are	XOR	AND	both	none	<b>c</b>
31	Generalization of broadcast in Which each processor is	Source as well as destination	only source	only destination	none	<b>a</b>
32	The algorithm terminates in _____ steps	p	p+1	p+2	p-1	<b>d</b>
33	Each node first sends to one of its neighbours the data it need to....	broadcast	identify	verify	none	<b>a</b>
34	The second communication phase is a columnwise _____ broadcast of consolidated	All-to-all	one -to-all	all-to-one	point-to-point	<b>a</b>

35	All nodes collects ____ message corresponding to $\sqrt{p}$ nodes to their respectively	$\sqrt{p}$	p	$p+1$	$p-1$	a
36	It is not possible to port ____ for higher dimensional network	Algorithm	hypercube	both	none	a
37	If we port algorithm to higher dimemsional network it would cause	error	contention	recursion	none	b
38	In the scatter operation ____ node send message to every other node	single	double	triple	none	a
39	The gather Operation is exactly the inverse of ____	scatter operation	recursion operation	execution	none	a
40	Similar communication pattern to all-to-all broadcast except in the ____	reverse order	parallel order	straight order	vertical order	a

<b>UNIT FIVE</b>	<b>SUB : 410241 HPC</b>					
<b>Sr. No.</b>	<b>Questions</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>Answer</b>
e.g 1	<b>Write down question</b>	<b>Option a</b>	<b>Option b</b>	<b>Option c</b>	<b>Option d</b>	<b>a/b/c/d</b>
1	In _____, the number of elements to be sorted is small enough to fit into the process's main memory.	internal sorting	internal searching	external sorting	external searching	<b>a</b>
2	_____ algorithms use auxiliary storage (such as tapes and hard disks) for sorting because the number of elements to be sorted is too large to fit into memory.	internal sorting	internal searching	External sorting	external searching	<b>c</b>
3	____ can be comparison-based or noncomparison-based.	searching	Sorting	both a and b	none of above	<b>b</b>
4	The fundamental operation of comparison-based sorting is _____.	compare-exchange	searching	Sorting	swapping	<b>a</b>
5	The complexity of bubble sort is $\Theta(n^2)$ .	TRUE	FALSE			<b>a</b>
6	Bubble sort is difficult to parallelize since the algorithm has no concurrency.	TRUE	FALSE			<b>a</b>
7	Quicksort is one of the most common sorting algorithms for sequential computers because of its simplicity, low overhead, and optimal average complexity.	TRUE	FALSE			<b>a</b>
8	The performance of quicksort depends critically on the quality of the _____.	non-pivot	pivot	center element	len of array	<b>b</b>

9	the complexity of quicksort is $O(n \log n)$ .	TRUE	FALSE			<b>a</b>
10	DFS begins by expanding the initial node and generating its successors. In each subsequent step, DFS expands one of the most recently generated nodes.	TRUE	FALSE			
11	The main advantage of _____ is that its storage requirement is linear in the depth of the state space being searched.	BFS	DFS	a and b	none of above	<b>b</b>
12	_____ algorithms use a heuristic to guide search.	BFS	DFS	a and b	none of above	<b>a</b>
13	If the heuristic is admissible, the BFS finds the optimal solution.	TRUE	FALSE			<b>a</b>
14	The search overhead factor of the parallel system is defined as the ratio of the work done by the parallel formulation to that done by the sequential formulation	TRUE	FALSE			<b>a</b>
15	The critical issue in parallel depth-first search algorithms is the distribution of the search space among the processors.	TRUE	FALSE			<b>a</b>
16	Graph search involves a closed list, where the major operation is a _____	sorting	searching	lookup	none of above	<b>c</b>
17	_____ algorithms use auxiliary storage (such as tapes and hard disks) for sorting because the number of elements to be sorted is too large to fit into memory.	internal sorting	internal searching	External sorting	external searching	<b>c</b>
18	_____ can be comparison-based or noncomparison-based.	searching	Sorting	both a and b	none of above	<b>b</b>

19	If the heuristic is admissible, the BFS finds the optimal solution.	TRUE	FALSE			<b>a</b>
20	The search overhead factor of the parallel system is defined as the ratio of the work done by the parallel formulation to that done by the sequential formulation	TRUE	FALSE			<b>a</b>
21	Breadth First Search is equivalent to which of the traversal in the Binary Trees?	Pre-order Traversal	Post-order Traversal	Level-order Traversal	In-order Traversal	<b>c</b>
22	Time Complexity of Breadth First Search is? (V – number of vertices, E – number of edges)	$O(V + E)$	$O(V)$	$O(E)$	$O(V^*E)$	<b>a</b>
23	Which of the following is not an application of Breadth First Search?	When the graph is a Binary Tree	When the graph is a Linked List	When the graph is a n-ary Tree	When the graph is a Ternary Tree	<b>b</b>
24	In BFS, how many times a node is visited?	Once	Twice	Equivalent to number of indegree of the node	Thrice	<b>c</b>
25	Is Best First Search a searching algorithm used in graphs.	TRUE	FALSE			<b>a</b>
26	The critical issue in parallel depth-first search algorithms is the distribution of the search space among the processors.	TRUE	FALSE			<b>a</b>
27	Graph search involves a closed list, where the major operation is a _____	sorting	searching	lookup	none of above	<b>c</b>

28	The fundamental operation of comparison-based sorting is _____.	compare-exchange	searching	Sorting	swapping	<b>a</b>
29	The complexity of bubble sort is $\Theta(n^2)$ .	TRUE	FALSE			<b>a</b>
30	DFS begins by expanding the initial node and generating its successors. In each subsequent step, DFS expands one of the most recently generated nodes.	TRUE	FALSE			
31	The main advantage of _____ is that its storage requirement is linear in the depth of the state space being searched.	BFS	DFS	a and b	none of above	<b>b</b>
32	Breadth First Search is equivalent to which of the traversals in the Binary Trees?	Pre-order Traversal	Post-order Traversal	Level-order Traversal	In-order Traversal	<b>c</b>
33	Time Complexity of Breadth First Search is? (V – number of vertices, E – number of edges)	$O(V + E)$	$O(V)$	$O(E)$	$O(V^*E)$	<b>a</b>
34	Which of the following is not an application of Breadth First Search?	When the graph is a Binary Tree	When the graph is a Linked List	When the graph is a n-ary Tree	When the graph is a Ternary Tree	<b>b</b>
35	In BFS, how many times a node is visited?	Once	Twice	Equivalent to number of indegree of the node	Thrice	<b>c</b>
36	Is Best First Search a searching algorithm used in graphs.	TRUE	FALSE			<b>a</b>

37	Which of the following is not a stable sorting algorithm in its typical implementation.	Insertion Sort	Merge Sort	Quick Sort	Bubble Sort	<b>c</b>
38	Which of the following is not true about comparison based sorting algorithms?	The minimum possible time complexity of a comparison based sorting algorithm is $O(n\log n)$ for a random input array	Any comparison based sorting algorithm can be made stable by using position as a criteria when two elements	Counting Sort is not a comparison based sorting algorithm	Heap Sort is not a comparison based sorting algorithm.	<b>d</b>
39	In _____, the number of elements to be sorted is small enough to fit into the process's main memory.	internal sorting	internal searching	external sorting	external searching	<b>a</b>

<b>UNIT SIX</b>	<b>SUB : 410241 HPC</b>					
<b>Sr. No.</b>	<b>Questions</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>Answer</b>
e.g 1	<b>Write down question</b>					
1	A CUDA program is comprised of two primary components: a host and a ____.	GPU kernel	CPU kernel	OS	none of above	<b>a</b>
2	The kernel code is identified by the _____ qualifier with void return type	_host_	_global_	_device_	void	<b>b</b>
3	The kernel code is only callable by the host	TRUE	FALSE			<b>a</b>
4	The kernel code is executable on the device and host	TRUE	FALSE			<b>b</b>
5	Calling a kernel is typically referred to as _____.	kernel thread	kernel initialization	kernel termination	kernel invocation	<b>d</b>
6	Host codes in a CUDA application can Initialize a device	TRUE	FALSE			<b>a</b>
7	Host codes in a CUDA application can Allocate GPU memory	TRUE	FALSE			<b>a</b>
8	A CUDA program is comprised of two primary components: a host and a ____.	GPU kernel	CPU kernel	OS	none of above	<b>a</b>
9	A CUDA program is comprised of two primary components: a host and a ____.	GPU kernel	CPU kernel	OS	none of above	<b>a</b>
10	The kernel code is identified by the _____ qualifier with void return type	_host_	_global_	_device_	void	<b>b</b>
11	Host codes in a CUDA application can not Invoke kernels	TRUE	FALSE			<b>b</b>

12	CUDA offers the Chevron Syntax to configure and execute a kernel.	TRUE	FALSE			<b>a</b>
13	the BlockPerGrid and ThreadPerBlock parameters are related to the _____ model supported by CUDA.	host	kernel	thread abstraction	none of above	<b>c</b>
14	_____ is Callable from the device only	host_	_global_	_device_	none of above	<b>c</b>
15	_____ is Callable from the host	host_	_global_	_device_	none of above	<b>b</b>
16	_____ is Callable from the host	host_	_global_	_device_	none of above	<b>a</b>
17	CUDA supports _____ in which code in a single thread is executed by all other threads.	tread division	tread termination	thread abstraction	none of above	<b>c</b>
18	In CUDA, a single invoked kernel is referred to as a _____.	block	tread	grid	none of above	<b>c</b>
19	A grid is comprised of _____ of threads.	block	bunch	host	none of above	<b>a</b>
20	A block is comprised of multiple _____.	treads	bunch	host	none of above	<b>a</b>
21	a solution of the problem in representing the parallelism in algorithm is	CUD	PTA	CDA	CUDA	<b>d</b>
22	_____ is Callable from the host	host_	_global_	_device_	none of above	<b>b</b>
23	_____ is Callable from the host	host_	_global_	_device_	none of above	<b>a</b>
24	A CUDA program is comprised of two primary components: a host and a _____.	GPU kernel	CPU kernel	OS	none of above	<b>a</b>
25	The kernel code is dentified by the _____ qualifier with void return type	host_	_global_	_device_	void	<b>b</b>

26	Host codes in a CUDA application can not Reset a device	TRUE	FALSE			<b>b</b>
27	Host codes in a CUDA application can not Invoke kernels	TRUE	FALSE			<b>b</b>
28	A CUDA program is comprised of two primary components: a host and a ____.	GPU kernel	CPU kernel	OS	none of above	<b>a</b>
29	Calling a kernel is typically referred to as _____.	kernel thread	kernel initialization	kernel termination	kernel invocation	<b>d</b>
30	In CUDA, a single invoked kernel is referred to as a _____.	block	tread	grid	none of above	<b>c</b>
31	A grid is comprised of _____ of threads.	block	bunch	host	none of above	<b>a</b>
32	A block is comprised of multiple _____.	treads	bunch	host	none of above	<b>a</b>
33	A CUDA program is comprised of two primary components: a host and a _____.	GPU kernel	CPU kernel	OS	none of above	<b>a</b>
34	_____ is Callable from the host	_host_	_global_	_device_	none of above	<b>a</b>
35	In CUDA, a single invoked kernel is referred to as a _____.	block	tread	grid	none of above	<b>c</b>
36	the BlockPerGrid and ThreadPerBlock parameters are related to the _____ model supported by CUDA.	host	kernel	thread abstract ion	none of above	<b>c</b>
37	Host codes in a CUDA application can Transfer data to and from the device	TRUE	FALSE			<b>a</b>
38	Host codes in a CUDA application can not Deallocate memory on the GPU	TRUE	FALSE			<b>b</b>

39	Host codes in a CUDA application can not Reset a device	TRUE	FALSE			<b>b</b>
40	Calling a kernel is typically referred to as _____.	kernel thread	kernel initialization	kernel termination	kernel invocation	<b>d</b>

UNIT FIVE SUB : 410241 HPC					
Questions	Option 1	Option 2	Option 3	Option 4	Ans
Which of the following statements is NOT TRUE for Internal Sorting algorithms	Usually deal with small number of elements	No of elements must be able to fit in process's main memory	Use auxilliary memory like tape or hard disk	Ususally are of type compare-exchange	3
In sorting networks for INCREASING COMPARATOR with input x,y select the correct output X', Y' from the following options	$X' = \min \{ x, y \}$ and $Y' = \min \{ x, y \}$	$X' = \max \{ x, y \}$ and $Y' = \min \{ x, y \}$	$X' = \min \{ x, y \}$ and $Y' = \max \{ x, y \}$	$X' = \max \{ x, y \}$ and $Y' = \max \{ x, y \}$	3
In sorting networks for DECREASING COMPARATOR with input x,y select the correct output X', Y' from the following options	$X' = \min \{ x, y \}$ and $Y' = \min \{ x, y \}$	$X' = \max \{ x, y \}$ and $Y' = \min \{ x, y \}$	$X' = \min \{ x, y \}$ and $Y' = \max \{ x, y \}$	$X' = \max \{ x, y \}$ and $Y' = \max \{ x, y \}$	2
Which of the following is TRUE for <b>Bitonic Sequence</b> a) Monotonically increasing b) Monotonically Decreasing c) With cyclic shift of indices d) First increasing then decreasing	a) and b)	a) and b) and d)	a) and b) and c)	a) and b) and c) and d)	4
Which of the following is <b>NOT</b> a BITONIC Sequence	{8, 6, 4, 2, 3, 5, 7, 9}	{0, 4, 8, 9, 2, 1}	{3, 5, 7, 9, 8, 6, 4, 2}	{1, 2, 4, 7, 6, 0, 1}	4
The procedure of sorting a bitonic sequence using bitonic splits is called	Bitonic Merge	Bitonic Split	Bitonic Divide	Bitonic Series	1

UNIT FIVE SUB : 410241 HPC					
Questions	Option 1	Option 2	Option 3	Option 4	Ans
Which of the following statements is NOT TRUE for Internal Sorting algorithms	Usually deal with small number of elements	No of elements must be able to fit in process's main memory	Use auxilliary memory like tape or hard disk	Ususally are of type compare-exchange	3
While mapping Bitonic sort on Hypercube, Compare-exchange operations take place between wires whose labels differ in	One Bit	Two bits	Three Bits	Four bits	1
Which of following is NOT A WAY of mapping the input wires of the bitonic sorting network to a MESH of processes	Row Major Mapping	Column Major Mapping	Row Major Snakelike mapping	Row Major Shuffled Mapping	2
Which is the sorting algorithm in below given steps - 1. procedure X_SORT(n) 2. begin 3. for i := n - 1 downto 1 do 4. for j := 1 to i do 5. compare-exchange(aj, aj + 1); 6. end X_SORT	Selection Sort	Bubble Sort	Parallel Selction Sort	Parallel Bubble Sort	2
The <b>odd-even transposition</b> algorithm sorts n elements in n phases (n is even), each of which requires -----compare-exchange operations	2n	n2	n/2	n	3

<b>UNIT FIVE SUB : 410241 HPC</b>					
<b>Questions</b>	<b>Option 1</b>	<b>Option 2</b>	<b>Option 3</b>	<b>Option 4</b>	<b>Ans</b>
Which of the following statements is NOT TRUE for Internal Sorting algorithms	Usually deal with small number of elements	No of elements must be able to fit in process's main memory	Use auxilliary memory like tape or hard disk	Ususally are of type compare-exchange	3
What is TRUE about SHELL SORT	Moves elements only one position at a time	Moves elements long distance	During second phase algorithm switches to odd even transposition sort	both 2 and 3	4
Which is the fastest sorting algorithm	Bubble Sort	Odd-Even Transposition Sort	Shell Sort	Quick Sort	4
Quicksort's performance is greatly affected by the way it partitions a sequence.	TRUE	FALSE			1
Pivot in Quick sort can be selected as	Always First Element	Always Last element	Always Middle index Element	Randomly Selected Element	4
Quick sort uses Recursive Decomposition	TRUE	FALSE			1
In first step of parallelizing quick sort for n elements to get subarrays, which of the following statement is TRUE	Only one process is used	n processes are used	two processes are used	None of the above	1

<b>UNIT FIVE SUB : 410241 HPC</b>					
<b>Questions</b>	<b>Option 1</b>	<b>Option 2</b>	<b>Option 3</b>	<b>Option 4</b>	<b>Ans</b>
Which of the following statements is NOT TRUE for Internal Sorting algorithms	Usually deal with small number of elements	No of elements must be able to fit in process's main memory	Use auxilliary memory like tape or hard disk	Ususally are of type compare-exchange	3
In Binary tree representation created by execution of Quick sort, Pivot is at	Leaf Node	Root of tree	Any internal node	None of the above	2
What is the worst case time complexity of a quick sort algorithm?	$O(N)$	$O(N \log N)$	$O(N^2)$	$O(\log N)$	3
What is the average running time of a quick sort algorithm?	$O(N)$	$O(N \log N)$	$O(N^2)$	$O(\log N)$	2
Odd-even transposition sort is a variation of	Quick Sort	Shell Sort	Bubble Sort	Selection Sort	3
What is the average case time complexity of odd-even transposition sort?	$O(N \log N)$	$O(N)$	$O(\log N)$	$O(N^2)$	4
Shell sort is an improvement on	Quick Sort	Bubble Sort	Insertion sort	Selection Sort	3
In parallel Quick Sort Pivot is sent to processes by	Broadcast	Multicast	Selective Multicast	Unicast	1

UNIT FIVE SUB : 410241 HPC					
Questions	Option 1	Option 2	Option 3	Option 4	Ans
Which of the following statements is NOT TRUE for Internal Sorting algorithms	Usually deal with small number of elements	No of elements must be able to fit in process's main memory	Use auxilliary memory like tape or hard disk	Ususally are of type compare-exchange	3
In parallel Quick Sort each process divides the unsorted list into	n Lists	2 Lists	4 Lists	n-1 Lists	2
Time Complexity of DFS is? (V – number of vertices, E – number of edges)	$O(V + E)$	$O(V)$	$O(E)$	$O(V^*E)$	1
A person wants to visit some places. He starts from a vertex and then wants to visit every vertex till it finishes from one vertex, backtracks and then explore other vertex from same vertex. What algorithm he should use?	BFS	DFS	Prim's	Kruskal's	2
Given an array of n elements and p processes, in the message-passing version of the parallel quicksort, each process stores -----elements of array	$n*p$	$n-p$	$p/n$	$n/p$	4
In parallel quick sort Pivot selecton strategy is crucial for	Maintaing load balance	Maintaining uniform distribution of elements in process groups	Effective Pivot selection in next level	all of the above	4

<b>UNIT FIVE SUB : 410241 HPC</b>					
<b>Questions</b>	<b>Option 1</b>	<b>Option 2</b>	<b>Option 3</b>	<b>Option 4</b>	<b>Ans</b>
Which of the following statements is NOT TRUE for Internal Sorting algorithms	Usually deal with small number of elements	No of elements must be able to fit in process's main memory	Use auxilliary memory like tape or hard disk	Ususally are of type compare-exchange	3
In execution of the hypercube formulation of quicksort for $d = 3$ , split along -----dimention to partition sequence into two big blocks, one greater than pivot and other smaller than pivot as shown in diagram	first	scond	third	None of above	3
Which Parallel formulation of Quick sort is possible	Shared-Address-Space Parallel Formulation	Message Passing formulation	Hypercube Formulation	All of the above	4
Which formulation of Dijkstra's algorithm exploits more parallelism	source-partitioned formulation	source-parallel formulation	Partitioned-Parallel Formulation	All of above	2
In Dijkstra's all pair shortest path each process compute the single-source shortest paths for all vertices assigned to it in SOURCE PARTITIONED FORMULATION	TRUE	FALSE			1

UNIT FIVE SUB : 410241 HPC					
Questions	Option 1	Option 2	Option 3	Option 4	Ans
Which of the following statements is NOT TRUE for Internal Sorting algorithms	Usually deal with small number of elements	No of elements must be able to fit in process's main memory	Use auxilliary memory like tape or hard disk	Ususally are of type compare-exchange	3
A complete graph is a graph in which each pair of vertices is adjacent	TRUE	FALSE			1
The space required to store the adjacency matrix of a graph with n vertices is	in order of n	in order of $n \log n$	in order of $n^2$	in order of $n/2$	3
Graph can be represented by	Identity Matrix	Adjacency Matrix	Sprse list	Sparse matrix	2
to solve the all-pairs shortest paths problem which algorithm/s is/are used a) Floyd's algorithm b) Dijkstra's single-source shortest paths c) Prim's Algorithm d) Kruskal's Algorithm	a) and c)	a) and b)	b) and c)	c) and d)	2
Simple backtracking is a depth-first search method that terminates upon finding the first solution.	TRUE	FALSE			1
Best-first search (BFS) algorithms can search both graphs and trees.	TRUE	FALSE			1

<b>UNIT FIVE SUB : 410241 HPC</b>					
<b>Questions</b>	<b>Option 1</b>	<b>Option 2</b>	<b>Option 3</b>	<b>Option 4</b>	<b>Ans</b>
Which of the following statements is NOT TRUE for Internal Sorting algorithms	Usually deal with small number of elements	No of elements must be able to fit in process's main memory	Use auxilliary memory like tape or hard disk	Ususally are of type compare-exchange	3
A* algorithm is a	BFS algorithm	DFS Algorithm	Prim's Algorithm	Kruskal's Algorithm	1
identify Load-Balancing Scheme/s	Asynchronous Round Robin	Global Round Robin	Random Polling	All above methods	4
important component of best-first search (BFS) algorithms is	Open List	Closed List	Node List	Mode List	1

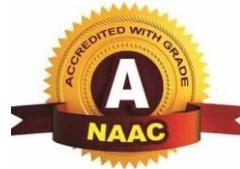
<b>UNIT SIX</b>	<b>SUB : 410241 HPC</b>					
<b>Sr. No.</b>	<b>Questions</b>	<b>Option 1</b>	<b>Option 2</b>	<b>Option 3</b>	<b>Option 4</b>	<b>Ans</b>
1	Any condition that causes a processor to stall is called as ____.	Hazard	Page fault	System error	None of the above	1
2	The time lost due to branch instruction is often referred to as ____.	Latency	Delay	Branch penalty	None of the above	3
3	____ method is used in centralized systems to perform out of order execution.	Scorecard	Score boarding	Optimizing	Redundancy	2
4	The computer cluster architecture emerged as an alternative for ____.	ISA	Workstation	Super computers	Distributed systems	3
5	NVIDIA CUDA Warp is made up of how many threads?	512	1024	312	32	4
6	Out-of-order instructions is not possible on GPUs.	TRUE	FALSE	--	--	2
7	CUDA supports programming in ....	C or C++ only	Java, Python, and more	C, C++, third party wrappers for Java, Python, and more	Pascal	3
8	FADD, FMAD, FMIN, FMAX are ---- supported by Scalar Processors of NVIDIA GPU.	32-bit IEEE floating point instructions	32-bit integer instructions	both	none of the above	1

9	Each streaming multiprocessor (SM) of CUDA hardware has ----- scalar processors (SP).	1024	128	512	8	<b>4</b>
10	Each NVIDIA GPU has ----- Streaming Multiprocessors	8	1024	512	16	<b>4</b>
11	CUDA provides ----- warp and thread scheduling. Also, the overhead of thread creation is on the order of ----.	“programming-overhead”, 2 clock	“zero-overhead”, 1 clock	64, 2 clock	32, 1 clock	<b>2</b>
12	Each warp of GPU receives a single instruction and “broadcasts” it to all of its threads. It is a ---- operation.	SIMD (Single instruction multiple data)	SIMT (Single instruction multiple thread)	SISD (Single instruction single data)	SIST (Single instruction single thread)	<b>2</b>
13	Limitations of CUDA Kernel	recursion, call stack, static variable declaration	No recursion, no call stack, no static variable declarations	recursion, no call stack, static variable declaration	No recursion, call stack, no static variable declarations	<b>2</b>
14	What is Unified Virtual Machine	It is a technique that allow both CPU and GPU to read from single virtual machine, simultaneously.	It is a technique for managing separate host and device memory spaces.	It is a technique for executing device code on host and host code on device.	It is a technique for executing general purpose programs on device instead of host.	<b>1</b>
15	_____ became the first language specifically designed by a GPU Company to facilitate general purpose computing on ____.	Python, GPUs.	C, CPUs.	CUDA C, GPUs.	Java, CPUs.	<b>3</b>

16	The CUDA architecture consists of ----- for parallel computing kernels and functions.	RISC instruction set architecture	CISC instruction set architecture	ZISC instruction set architecture	PTX instruction set architecture	<b>4</b>
17	CUDA stands for -----, designed by NVIDIA.	Common Union Discrete Architecture	Complex Unidentified Device Architecture	Compute Unified Device Architecture	Complex Unstructured Distributed Architecture	<b>3</b>
18	The host processor spawns multithread tasks (or kernels as they are known in CUDA) onto the GPU device. State true or false.	TRUE	FALSE	---	---	<b>1</b>
19	The NVIDIA G80 is a ---- CUDA core device, the NVIDIA G200 is a ---- CUDA core device, and the NVIDIA Fermi is a ---- CUDA core device.	128, 256, 512	32, 64, 128	64, 128, 256	256, 512, 1024	<b>1</b>
20	NVIDIA 8-series GPUs offer ----- .	50-200 GFLOPS	200-400 GFLOPS	400-800 GFLOPS	800-1000 GFLOPS	<b>1</b>
21	IADD, IMUL24, IMAD24, IMIN, IMAX are ----- supported by Scalar Processors of NVIDIA GPU.	32-bit IEEE floating point instructions	32-bit integer instructions	both	none of the above	<b>2</b>
22	CUDA Hardware programming model supports: a) fully generally data-parallel archtecture; b) General thread launch; c) Global load-store; d) Parallel data cache; e) Scalar architecture; f) Integers, bit operation	a,c,d,f	b,c,d,e	a,d,e,f	a,b,c,d,e,f	<b>4</b>

23	In CUDA memory model there are following memory types available: a) Registers; b) Local Memory; c) Shared Memory; d) Global Memory; e) Constant Memory; f) Texture Memory.	a, b, d, f	a, c, d, e, f	a, b, c, d, e, f	b, c, e, f	<b>3</b>
24	What is the equivalent of general C program with CUDA C: int main(void) { printf("Hello, World!\n"); return 0; }	int main ( void ) { kernel <<<1,1>>>0; printf("Hello, World!\n"); return 0; }	_global_ void kernel( void ) { } int main ( void ) { kernel <<<1,1>>>0; printf("Hello, World!\n"); return 0; }	_global_ void kernel( void ) { kernel <<<1,1>>>0; printf("Hello, World!\n"); return 0; }	_global_ int main ( void ) { kernel <<<1,1>>>0; printf("Hello, World!\n"); return 0; }	<b>2</b>
25	Which function runs on Device (i.e. GPU): a) _global_ void kernel (void ) { } b) int main ( void ) { ... return 0; }	a	b	both a,b	---	<b>1</b>
26	A simple kernel for adding two integers: <code>_global_ void add( int *a, int *b, int *c ) { *c = *a + *b; }</code> where <code>_global_</code> is a CUDA C keyword which indicates that:	add() will execute on device, add() will be called from host	add() will execute on host, add() will be called from device	add() will be called and executed on host	add() will be called and executed on device	<b>1</b>
27	If variable a is host variable and dev_a is a device (GPU) variable, to allocate memory to dev_a select correct statement:	cudaMalloc( &dev_a, sizeof( int ) )	malloc( &dev_a, sizeof( int ) )	cudaMalloc( (void**) &dev_a, sizeof( int ) )	malloc( (void**) &dev_a, sizeof( int ) )	<b>3</b>

28	If variable a is host variable and dev_a is a device (GPU) variable, to copy input from variable a to variable dev_a select correct statement:	memcpy( dev_a, &a, size);	cudaMemcpy( dev_a, &a, size, cudaMemcpyHostToDevice );	memcpy( void* ) dev_a, &a, size);	cudaMemcpy( void* ) &dev_a, &a, size, cudaMemcpyDeviceToHost );	<b>2</b>
29	Triple angle brackets mark in a statement inside main function, what does it indicates?	a call from host code to device code	a call from device code to host code	less than comparison	greater than comparison	<b>1</b>
30	What makes a CUDA code runs in parallel	<code>_global_</code> indicates parallel execution of code	main() function indicates parallel execution of code	Kernel name outside triple angle bracket indicates execution of kernel N times in parallel	first parameter value inside triple angle bracket (N) indicates execution of kernel N times in parallel	<b>4</b>



**Name of the Teacher: Dr. Prasad S.Halgaonkar**

**Class: BE  
AY: 2020-21**

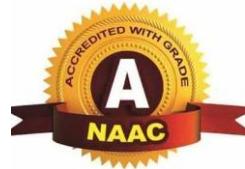
**Subject: High Performance Computing  
SEM: I**

## **UNIT-1**

1)	Conventional architectures coarsely comprise of a_____  a) processor b) Memory system c) Datapath. d) All of Above
<b>Ans:</b>	<b>d</b>
<b>Explanation:</b>	
2)	Data intensive applications utilize_____  a) High aggregate throughput b) High aggregate network bandwidth c) High processing and memory system performance. d) None of above
<b>Ans:</b>	<b>a</b>
<b>Explanation:</b>	
3)	A pipeline is like_____  a. Overlaps various stages of instruction execution to achieve performance. b. House pipeline c. Both a and b d. gas line
<b>Ans:</b>	<b>a</b>
<b>Explanation:</b>	
4)	Scheduling of instructions is determined _____  a) True Data Dependency b) Resource Dependency c) Branch Dependency d) All of above
<b>Ans:</b>	<b>d</b>
<b>Explanation:</b>	
5)	VLIW processors rely on_____



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	<ul style="list-style-type: none"><li>a) Compile time analysis</li><li>b) Initial time analysis</li><li>c) Final time analysis</li><li>d) Mid time analysis</li></ul>
<b>Ans:</b>	<b>a</b>
<b>Explanation:</b>	
6)	Memory system performance is largely captured by_____
	<ul style="list-style-type: none"><li>a) Latency</li><li>b) Bandwidth</li><li>c) Both a and b</li><li>d) none of above</li></ul>
<b>Ans:</b>	<b>c</b>
<b>Explanation:</b>	
7)	The fraction of data references satisfied by the cache is called_____
	<ul style="list-style-type: none"><li>a) Cache hit ratio</li><li>b) Cache fit ratio</li><li>c) Cache best ratio</li><li>d) none of above</li></ul>
<b>Ans:</b>	<b>a</b>
<b>Explanation:</b>	
8)	A single control unit that dispatches the same Instruction to various processors is____
	<ul style="list-style-type: none"><li>a) SIMD</li><li>b) SPMD</li><li>c) MIMD</li><li>d) None of above</li></ul>
<b>Ans:</b>	<b>a</b>
<b>Explanation:</b>	
9)	The primary forms of data exchange between parallel tasks are_____
	<ul style="list-style-type: none"><li>a. Accessing a shared data space</li><li>b. Exchanging messages.</li><li>c. Both A and B</li><li>d. None of Above</li></ul>
<b>Ans:</b>	<b>c</b>
<b>Explanation:</b>	
10)	Switches map a fixed number of inputs to outputs.
	<ul style="list-style-type: none"><li>a) True</li><li>b) False</li></ul>



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<b>Ans:</b>	<b>a</b>
<b>Explanation:</b>	
11)	The stage in which the CPU fetches the instructions from the instruction cache in superscalar organization is <ul style="list-style-type: none"><li>a) Prefetch stage</li><li>b) D1 (first decode) stage</li><li>c) D2 (second decode) stage</li><li>d) Final stage</li></ul>
<b>Ans:</b>	<b>a</b>
<b>Explanation:</b>	In the prefetch stage of pipeline, the CPU fetches the instructions from the instruction cache, which stores the instructions to be executed. In this stage, CPU also aligns the codes appropriately.
12)	The CPU decodes the instructions and generates control words in <ul style="list-style-type: none"><li>a) Prefetch stage</li><li>b) D1 (first decode) stage</li><li>c) D2 (second decode) stage</li><li>d) Final stage</li></ul>
<b>Ans:</b>	<b>b</b>
<b>Explanation:</b>	In D1 stage, the CPU decodes the instructions and generates control words. For simple RISC instructions, only single control word is enough for starting the execution.
13)	The fifth stage of pipeline is also known as <ul style="list-style-type: none"><li>a) read back stage</li><li>b) read forward stage</li><li>c) write back stage</li><li>d) none of the mentioned</li></ul>
<b>Ans:</b>	<b>c</b>
<b>Explanation:</b>	The fifth stage or final stage of pipeline is also known as "Write back (WB) stage".
14)	In the execution stage the function performed is <ul style="list-style-type: none"><li>a) CPU accesses data cache</li><li>b) executes arithmetic/logic computations</li><li>c) executes floating point operations in execution unit</li><li>d) all of the mentioned</li></ul>
<b>Ans:</b>	<b>d</b>
<b>Explanation:</b>	In the execution stage, known as E-stage, the CPU accesses data cache, executes arithmetic/logic computations, and floating point operations in execution unit.
15)	The stage in which the CPU generates an address for data memory references in this stage is <ul style="list-style-type: none"><li>a) prefetch stage</li><li>b) D1 (first decode) stage</li><li>c) D2 (second decode) stage</li><li>d) execution stage</li></ul>
<b>Ans:</b>	<b>c</b>



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<b>Explanation:</b>	In the D2 (second decode) stage, CPU generates an address for data memory references in this stage. This stage is required where the control word from D1 stage is again decoded for final execution.
16)	The feature of separated caches is <ul style="list-style-type: none"><li>a) supports the superscalar organization</li><li>b) high bandwidth</li><li>c) low hit ratio</li><li>d) all of the mentioned</li></ul>
<b>Ans:</b>	<b>d</b>
<b>Explanation:</b>	The separated caches have low hit ratio compared to a unified cache, but have the advantage of supporting the superscalar organization and high bandwidth.
17)	In the operand fetch stage, the FPU (Floating Point Unit) fetches the operands from <ul style="list-style-type: none"><li>a) floating point unit</li><li>b) instruction cache</li><li>c) floating point register file or data cache</li><li>d) floating point register file or instruction cache</li></ul>
<b>Ans:</b>	<b>C</b>
<b>Explanation:</b>	In the operand fetch stage, the FPU (Floating Point Unit) fetches the operands from either floating point register file or data cache.
18)	The FPU (Floating Point Unit) writes the results to the floating point register file in <ul style="list-style-type: none"><li>a) X1 execution state</li><li>b) X2 execution state</li><li>c) write back stage</li><li>d) none of the mentioned</li></ul>
<b>Ans:</b>	<b>c</b>
<b>Explanation:</b>	In the two execution stages of X1 and X2, the floating point unit reads the data from the data cache and executes the floating point computation. In the "write back stage" of pipeline, the FPU (Floating Point Unit) writes the results to the floating point register file.
19)	The floating point multiplier segment performs floating point multiplication in <ul style="list-style-type: none"><li>a) single precision</li><li>b) double precision</li><li>c) extended precision</li><li>d) all of the mentioned</li></ul>
<b>Ans:</b>	<b>d</b>
<b>Explanation:</b>	The floating point multiplier segment performs floating point multiplication in single precision, double precision and extended precision.
20)	The instruction or segment that executes the floating point square root instructions is <ul style="list-style-type: none"><li>a) floating point square root segment</li><li>b) floating point division and square root segment</li><li>c) floating point divider segment</li><li>d) none of the mentioned</li></ul>



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<b>Ans:</b>	c
<b>Explanation:</b>	The floating point divider segment executes the floating point division and square root instructions.
<b>21)</b>	<p>The floating point rounder segment performs rounding off operation at</p> <p>a) after write back stage b) before write back stage c) before arithmetic operations d) none of the mentioned</p>
<b>Ans:</b>	b
<b>Explanation:</b>	The results of floating point addition or division process may be required to be rounded off, before write back stage to the floating point registers.
<b>21)</b>	<p>Which of the following is a floating point exception that is generated in case of integer arithmetic?</p> <p>a) divide by zero b) overflow c) denormal operand d) all of the mentioned</p>
<b>Ans:</b>	D
<b>Explanation:</b>	In the case of integer arithmetic, the possible floating point exceptions in Pentium are: 1. divide by zero 2. overflow 3. denormal operand 4. underflow 5. invalid operation.

Name and Sign of Subject Teacher



**Name of the Teacher: Dr. Prasad S.Halgaonkar**

**Class: BE**  
**AY: 2020-21**

**Subject: High Performance Computing**  
**SEM: I**

## **UNIT-2**

**Note: Correct Answers are in Bold Fonts**

1. The First step in developing a parallel algorithm is\_  
**A. To Decompose the problem into tasks that can be executed concurrently**  
B. Execute directly  
C. Execute indirectly  
D. None of Above
  
2. The number of tasks into which a problem is decomposed determines its\_  
**A. Granularity**  
B. Priority  
C. Modernity  
D. None of above
  
3. The length of the longest path in a task dependency graph is called\_  
**A. the critical path length**  
B. the critical data length  
C. the critical bit length  
D. None of above
  
4. The graph of tasks (nodes) and their interactions/data exchange (edges)\_  
**A. Is referred to as a task interaction graph**  
B. Is referred to as a *task Communication graph*  
C. Is referred to as a *task interface graph*  
D. None of Above
  
5. Mappings are determined by\_  
**A. task dependency**  
**B. task interaction graphs**  
**C. Both A and B**  
D. None of Above
  
6. Decomposition Techniques are\_  
A. recursive decomposition  
B. data decomposition  
C. exploratory decomposition



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- D. speculative decomposition  
**E. All of Above**
7. The *Owner Computes Rule* generally states that the process assigned a particular data item is responsible for\_
- A. All computation associated with it**  
B. Only one computation  
C. Only two computation  
D. Only occasionally computation
8. A simple application of exploratory decomposition is\_
- A. The solution to a 15 puzzle**  
B. The solution to 20 puzzle  
C. The solution to any puzzle  
D. None of Above
9. Speculative Decomposition consist of \_
- A. conservative approaches  
B. optimistic approaches  
**C. Both A and B**  
D. Only B
10. task characteristics include:
- A. Task generation.  
B. Task sizes.  
C. Size of data associated with tasks.  
**D. All of Above**
11. Choose the most accurate (**CORRECT**) statement:
- a. Scalability is a measure of the capacity to increase speedup in proportion to the number of processors**  
b. Efficiency is the ratio of the serial run time of the best sequential algorithm for solving a problem to the time taken by the parallel algorithm to solve the same problem on  $p$  processors  
c. Run time is the time that elapses from the moment a parallel computation starts to the moment the last processor finishes.  
d. Superlinear is the fraction of time for which a processor is usefully employed
12. Parallelism can be used to increase the (parallel) size of the problem is applicable in \_\_\_\_\_.
- a. Amdahl's Law  
**b. Gustafson-Barsis's Law**  
c. Newton's Law



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- d. Pascal's Law
13. \_\_\_\_\_ is due to load imbalance, synchronization, or serial components as parts of overheads in parallel programs.
- Interprocess interaction
  - Synchronization
  - Idling**
  - Excess computation
14. Which of the following parallel methodological design elements focuses on recognizing opportunities for parallel execution?
- Partitioning**
  - Communication
  - Agglomeration
  - Mapping
15. Considering to use weak or strong scaling is part of \_\_\_\_\_ in addressing the challenges of distributed memory programming.
- Splitting the problem
  - Speeding up computations**
  - Speeding up communication
  - Speeding up hardware
16. Domain and functional decomposition are considered in the following parallel methodological design elements, EXCEPT:
- Partitioning
  - Communication
  - Agglomeration**
  - Mapping
17. Synchronization is one of the common issues in parallel programming. The issues related to synchronization include the followings, EXCEPT:
- Deadlock
  - Livelock
  - Fairness
  - Correctness**
18. Which of the followings is the **BEST** description of Message Passing Interface (MPI)?
- A specification of a shared memory library
  - MPI uses objects called communicators and groups to define which collection of processes may communicate with each other**
  - Only communicators and not groups are accessible to the programmer only by a "handle"
  - A communicator is an ordered set of processes

Name and Sign of Subject Teacher



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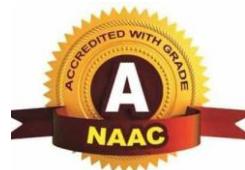
<b>Name of the Teacher:</b> Mr. B A Chaugule <b>Class:</b> BE <b>AY:</b> 2020-21	
<b>UNIT-1</b>	
1)	Execution of several activities at the same time. a) processing b) parallel processing c) serial processing d) multitasking
<b>Ans:</b>	<b>b</b>
<b>Explanation:</b>	
2)	Parallel processing has single execution flow. a) True b) False
<b>Ans:</b>	<b>b</b>
<b>Explanation:</b>	The statement is false. Sequential programming specifically has single execution flow.
3)	A term for simultaneous access to a resource, physical or logical. a) Multiprogramming b) Multitasking c) Threads d) Concurrency
<b>Ans:</b>	<b>d</b>
<b>Explanation:</b>	Concurrency is the term used for the same. When several things are accessed simultaneously, the job is said to be concurrent.
4)	_____ leads to concurrency. a) Serialization b) Parallelism c) Serial processing d) Distribution
<b>Ans:</b>	<b>b</b>
<b>Explanation:</b>	Parallelism leads naturally to Concurrency. For example, Several processes trying to print a file on a single printer.
5)	A parallelism based on increasing processor word size. a) Increasing b) Count based c) Bit based d) Bit level
<b>Ans:</b>	<b>d</b>
<b>Explanation:</b>	Bit level parallelism is based on increasing processor word size. It focuses on hardware capabilities for structuring.
6)	The measure of the "effort" needed to maintain efficiency while adding processors. a) Maintainability b) Efficiency



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	c) Scalability d) Effectiveness
<b>Ans:</b>	<b>C</b>
<b>Explanation:</b>	The measure of the "effort" needed to maintain efficiency while adding processors is called as scalability.
7)	Several instructions execution simultaneously in _____
	a) processing b) parallel processing c) serial processing d) multitasking
<b>Ans:</b>	<b>b</b>
<b>Explanation:</b>	In parallel processing, the several instructions are executed simultaneously.
8)	Conventional architectures coarsely comprise of a_
	a) A processor b) Memory system c) Data path. d) All of Above
<b>Ans:</b>	<b>d</b>
<b>Explanation:</b>	
9)	A pipeline is like_
	a) Overlaps various stages of instruction execution to achieve performance. b) House pipeline c) Both a and b d) A gas line
<b>Ans:</b>	<b>a</b>
<b>Explanation:</b>	
10)	VLIW processors rely on_
	a) Compile time analysis b) Initial time analysis c) Final time analysis d) Mid time analysis
<b>Ans:</b>	<b>a</b>
<b>Explanation:</b>	
11)	Memory system performance is largely captured by_
	a) Latency b) Bandwidth c) Both a and b d) none of above
<b>Ans:</b>	<b>c</b>
<b>Explanation:</b>	
12)	The fraction of data references satisfied by the cache is called_
	a) Cache hit ratio b) Cache fit ratio



	c) Cache best ratio d) none of above
<b>Ans:</b>	<b>a</b>
<b>Explanation:</b>	
13)	A single control unit that dispatches the same instruction to various processors is _____
	a) SIMD b) SPMD c) MIMD d) None of above
<b>Ans:</b>	<b>a</b>
<b>Explanation:</b>	
14)	The primary forms of data exchange between parallel tasks are _____
	a) Accessing a shared data space b) Exchanging messages. c) Both A and B d) None of Above
<b>Ans:</b>	<b>c</b>
<b>Explanation:</b>	
16)	Switches map a fixed number of inputs to outputs.
	a) True b) False
<b>Ans:</b>	<b>a</b>
<b>Explanation:</b>	

## UNIT-2

1)	The First step in developing a parallel algorithm is _____
	a) To Decompose the problem into tasks that can be executed concurrently b) Execute directly c) Execute indirectly d) None of Above
<b>Ans:</b>	<b>a</b>
<b>Explanation:</b>	
2)	The number of tasks into which a problem is decomposed determines its _____
	a) Granularity b) Priority c) Modernity d) None of above
<b>Ans:</b>	<b>A</b>
<b>Explanation:</b>	
3)	The length of the longest path in a task dependency graph is called _____
	a) the critical path length b) the critical data length c) the critical bit length



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	d) None of above
<b>Ans:</b>	<b>a</b>
<b>Explanation:</b>	
4)	The graph of tasks (nodes) and their interactions/data exchange (edges)_
	a) Is referred to as a task interaction graph b) Is referred to as a task Communication graph c) Is referred to as a task interface graph d) None of Above
<b>Ans:</b>	<b>a</b>
<b>Explanation:</b>	
5)	Mappings are determined by_
	a) task dependency b) task interaction graphs c) Both A and B d) None of Above
<b>Ans:</b>	<b>c</b>
<b>Explanation:</b>	
6)	Decomposition Techniques are_
	a) recursive decomposition b) data decomposition c) exploratory decomposition d) speculative decomposition e) All of Above
<b>Ans:</b>	<b>E</b>
<b>Explanation:</b>	
7)	The Owner Computes Rule generally states that the process assigned a particular data item is responsible for_
	a) All computation associated with it b) Only one computation c) Only two computation d) Only occasionally computation
<b>Ans:</b>	<b>A</b>
<b>Explanation:</b>	
8)	A simple application of exploratory decomposition is_
	a) The solution to a 15 puzzle b) The solution to 20 puzzle c) The solution to any puzzle d) None of Above
<b>Ans:</b>	<b>A</b>
<b>Explanation:</b>	
9)	Speculative Decomposition consist of _



	<ul style="list-style-type: none"><li>a) conservative approaches</li><li>b) optimistic approaches</li><li>c) Both A and B</li><li>d) Only B</li></ul>
<b>Ans:</b>	<b>C</b>
<b>Explanation:</b>	
10)	task characteristics include: <ul style="list-style-type: none"><li>a) Task generation.</li><li>b) Task sizes.</li><li>c) Size of data associated with tasks.</li><li>d) All of Above</li></ul>
<b>Ans:</b>	<b>d</b>
<b>Explanation:</b>	
<b>UNIT-3</b>	
1)	Group communication operations are built using point-to-point messaging primitives <ul style="list-style-type: none"><li>a) True</li><li>b) False</li></ul>
<b>Ans:</b>	<b>A</b>
<b>Explanation:</b>	
2)	Communicating a message of size m over an uncongested network takes time $ts + tmw$ <ul style="list-style-type: none"><li>a) True</li><li>b) False</li></ul>
<b>Ans:</b>	<b>A</b>
<b>Explanation:</b>	
3)	The dual of one-to-all broadcast is_ <ul style="list-style-type: none"><li>a) All-to-one reduction</li><li>b) All-to-one receiver</li><li>c) All-to-one Sum</li><li>d) None of Above</li></ul>
<b>Ans:</b>	<b>A</b>
<b>Explanation:</b>	
4)	A hypercube has_ <ul style="list-style-type: none"><li>a) <math>2d</math> nodes</li><li>b) <math>2d</math> nodes</li><li>c) <math>2n</math> Nodes</li><li>d) <math>N</math> Nodes</li></ul>
<b>Ans:</b>	<b>a</b>
<b>Explanation:</b>	
5)	A binary tree in which processors are (logically) at the leaves and internal nodes are routing nodes.

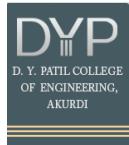


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	a) True b) False
<b>Ans:</b>	<b>A</b>
<b>Explanation:</b>	
6)	In All-to-All Broadcast each processor is the source as well as destination.
	a) True b) False
<b>Ans:</b>	<b>A</b>
<b>Explanation:</b>	
7)	The Prefix Sum Operation can be implemented using the_
	a) All-to-all broadcast kernel. b) All-to-one broadcast kernel. c) One-to-all broadcast Kernel d) Scatter Kernel
<b>Ans:</b>	<b>A</b>
<b>Explanation:</b>	
8)	In the scatter operation_
	a) Single node send a unique message of size m to every other node b) Single node send a same message of size m to every other node c) Single node send a unique message of size m to next node d) None of Above
<b>Ans:</b>	<b>A</b>
<b>Explanation:</b>	
9)	The gather operation is exactly the inverse of the_
	a) Scatter operation b) Broadcast operation c) Prefix Sum d) Reduction operation
<b>Ans:</b>	<b>A</b>
<b>Explanation:</b>	
10)	In All-to-All Personalized Communication Each node has a distinct message of size m for every other node
	a) True b) False
<b>Ans:</b>	<b>a</b>
<b>Explanation:</b>	

Name and Sign of Subject Teacher



**D. Y. Patil College of Engineering, Akurdi, Pune 411044**  
**Department of Computer Engineering**

Date: 23/07/2020

Class : BE Computer  
Academic Year : 2020-21

Div: A + B  
Sem : I

Subject : High Performance Computing  
Exam Date: 23/07/2020

<b><i>Q. No.</i></b>	<b><i>Question Description</i></b>	<b><i>Options</i></b>	<b><i>Correct Answer</i></b>	<b><i>Marks</i></b>	<b><i>CO</i></b>	<b><i>PO</i></b>	<b><i>PSO</i></b>	<b><i>BTL</i></b>
1	Select different aspects of parallelism	A. data intensive applications utilize high aggregate throughput B. server applications utilize high aggregate network bandwidth C. scientific applications typically utilize high processing and memory system performance D. all of the above	<b>D</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>4</b>
2	Select correct answer: DRAM access times have only improved at the rate of roughly ____% per year over this interval.	A. 10 B. 20 C. 40 D. 50	<b>A</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>4</b>
3	Justify, why to use parallel computing?	A. Real world is massively parallel B. Save time and/or time C. Solve larger / more complex problems D. Provide concurrency E. All of the above	<b>E</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>5</b>
4	Analyze, if the second instruction has data dependencies with the first, but the third instruction does not, the first	A. In-order B. Out-of-order C. Both of the above D. None of the above	<b>B</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>4</b>

	and third instructions can be co-scheduled. Which type if this issue is?							
5	Select the parameters which captures Memory system performance	A. Latency B. Bandwidth C. Both of the above D. None of the above	C	2	1	3	3	4
6	Consider the example of a fire-hose. If the water comes out of the hose five seconds after the hydrant is turned on. Once the water starts flowing, if the hydrant delivers water at the rate of 15 gallons/second. Analyze the bandwidth and latency.	A. Bandwidth: 5 gallons/second and Latency: 15 seconds B. Bandwidth: 5*15 gallons/second and Latency: 15 seconds C. Bandwidth: 15 gallons/second and Latency: 5 seconds D. Bandwidth: 3 gallons/second and Latency: 5 seconds	C	2	1	4	3	5
7	Select alternate approaches for Hiding Memory Latency	A. Prefetching B. Multithreading C. spatial locality D. all of the above	D	2	1	3	3	4
8	Select which clause in OpenMP is similar to the private, except values of variables are initialized to corresponding values before the	A. Private B. Firstprivate C. Shared D. All of the above	B	2	1	5	3	4

	parallel directive.						
9	The time which includes all overheads that are determined by the length of the message like bandwidth of links, error checking and correction, etc. is called as	A. Startup time (ts) B. Per-hop time (th) C. Per-word transfer time (tw) D. All of the above	C	2	1	1	3 1
10	Select in which routing technique, Message is divided into packets?	A. Store-and-forward routing B. Packet routing C. cut-through-routing D. in both 2 and 3	D	2	1	3	3 4
11	Which of the following is an efficient method of cache updating?	A. Snoopy writes B. Write through C. Write within D. Buffered write	A	2	1	1	3 1
12	Select which protocol is used for maintaining coherence of multiple processors?	A. Data coherence protocols B. Commit coherence protocols C. Recurrence D. Cache coherence protocols	D	2	1	3	3 4
13	From inter-processor communication, the misses arises are often called	A. Coherence misses B. Commit misses C. Parallel processing D. Hit rate	A	2	1	1	3 1
14	As per Flynn's Classification, where Parallel processing may occur?	A. in the instruction stream B. in the data stream C. both of the above D. none of the above	C	2	1	1	3 1

15	Which of the following projects of Blue Gene is not in development?	A. Blue Gene / L B. Blue Gene / M C. Blue Gene / P D. Blue Gene / Q	<b>B</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>1</b>
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(Mrs. Dhanashree Phalke) (Mrs. Vaishali Kolhe)  
 Subject Teacher Academic Coordinator

( Dr. Kailash Shaw)  
 Dept. NBA Coordinator

(Dr. Vinayak Kottawar)  
 HOD Computer

**Unit Test II**

Date: 26/08/2020

Class : BE Computer  
 Academic Year : 2020-21

Div: A + B  
 Sem : I

Subject : High Performance Computing  
 Exam Date: 26/08/2020

<b><i>Q. No.</i></b>	<b><i>Question Description</i></b>	<b><i>Options 28</i></b>	<b><i>Correct Answer</i></b>	<b><i>Marks</i></b>	<b><i>CO</i></b>	<b><i>PO</i></b>	<b><i>PSO</i></b>	<b><i>BTL</i></b>
1	Task interaction graphs represent _____ dependencies, whereas task dependency graphs represent _____ dependencies.	A. control, data B. task, data C. process, control D. data, control	<b>D</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>4</b>
2	Select correct answer. Which graph represents tasks as nodes and their interactions/data exchange as edges?	A. task dependency graph B. process dependency graph C. process interaction graph D. task interaction graph	<b>D</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>4</b>
3	The average number of tasks that can be processed in parallel over the execution of the program is called as _____	A. average degree of concurrency B. degree of concurrency C. critical path length D. maximum concurrency	<b>A</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>4</b>
4	The number of tasks that can be executed in	A. average concurrency B. degree of concurrency C. critical path length	<b>B</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>4</b>

	parallel is the _____ of a decomposition.	D. maximum concurrency						
5	A decomposition can be illustrated in the form of a directed graph with nodes corresponding to tasks and edges indicating that the result of one task is required for processing the next. Such graph is called as _____	A. process dependency graph B. task dependency graph C. task interaction graph D. process interaction graph	<b>B</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>4</b>
6	In which case, the owner computes rule implies that the output is computed by the process to which the output data is assigned?	A. input data decomposition B. output data decomposition C. Both of the above D. None of the above	<b>B</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>3</b>	<b>5</b>
7	Select relevant task characteristics from the options given below:	A. Task generation B. Task sizes C. Size of data associated with tasks D. All of the above	<b>D</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>4</b>
8	A classic example of game playing - each 15 puzzle board is the example of _____	A. Static Task Generation B. Dynamic Task Generation C. None of the above D. All of the above	<b>B</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>4</b>
9	Analyze task interaction pattern	A. static regular interaction pattern B. static irregular interaction pattern	<b>B</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>5</b>

	of the multiplication of a sparse matrix with a vector.	C. dynamic regular interaction pattern D. dynamic irregular interaction pattern						
10	Select the methods for containing Interaction Overheads.	A. Maximize data locality B. Minimize volume of data exchange C. Minimize frequency of interactions D. Minimize contention and hot-spots E. All of the above	<b>E</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>4</b>
11	Which model is equally suitable to shared-address-space or message-passing paradigms, since the interaction is naturally two ways.	A. Work pool model B. Master slave model C. Data parallel model D. Producer consumer or pipeline model	<b>B</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>4</b>
12	In which type of the model, tasks are dynamically assigned to the processes for balancing the load?	A. Work pool model B. Master slave model C. Data parallel model D. Producer consumer or pipeline model	<b>A</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>4</b>
13	Select the appropriate stage of GPU Pipeline which receives commands from CPU and also pulls geometry information from system memory.	A. pixel processing B. vertex processing C. memory interface D. host interface	<b>D</b>	<b>2</b>	<b>2</b>	<b>12</b>	<b>3</b>	<b>4</b>
14	Select the hardware specifications	A. GPU Clock Speed B. Size of memory bus C. Amount of available memory	<b>E</b>	<b>2</b>	<b>2</b>	<b>12</b>	<b>3</b>	<b>1</b>

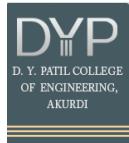
	which most affect the GPU cards speed.	D. Memory Clock Rate E. All of the above						
15	Select the appropriate stage of GPU Pipeline where computations include texture mapping and math operations.	A. pixel processing B. vertex processing C. memory interface D. host interface	<b>A</b>	<b>2</b>	<b>2</b>	<b>12</b>	<b>3</b>	<b>1</b>

(Mrs. Dhanashree Phalke)  
Subject Teacher

(Mrs. Vaishali Kolhe)  
Academic Coordinator

( Dr. Kailash Shaw)  
Dept. NBA Coordinator

(Dr. Vinayak Kottawar)  
HOD Computer



**D. Y. Patil College of Engineering, Akurdi, Pune 411044**  
**Department of Computer Engineering**

**Unit Test III**

Date: 14/10/2020

Class : BE Computer  
Academic Year : 2020-21

Div: A  
Sem : I

Subject : High Performance Computing  
Exam Date: 14/10/2020

<b><i>Q. No.</i></b>	<b><i>Question Description</i></b>	<b><i>Options 28</i></b>	<b><i>Correct Answer</i></b>	<b><i>Marks</i></b>	<b><i>CO</i></b>	<b><i>PO</i></b>	<b><i>PSO</i></b>	<b><i>BTL</i></b>
1	In all-to-one reduction, data items must be combined piece-wise and the result made available at a _____ processor.	A. First B. Last C. Target D. N-1	C	2	3	1	3	4
2	Analyze the Cost of Scatter and Gather .	A. $T=tw \log p + ts m (p-1)$ B. $T=ts \log p + tw m (p-1)$ C. $T=ts \log p - tw m (p-1)$ D. $T=tw \log p - ts m (p-1)$	B	2	3	4	3	4
3	All-to-all personalized communication is also known as _____.	A. partial exchange B. total exchange C. both of the above D. none of the above	B	2	3	1	3	1
4	All-to-all personalized communication is performed independently in each row with clustered messages of size _____ on a mesh.	A. m B. p C. $m\sqrt{p}$ D. $p\sqrt{m}$	C	2	3	1	3	4
5	In All-to-All Personalized Communication on a Ring, the size of the message reduces by _____ at each step	A. m B. p C. m-1 D. p-1	A	2	3	1	3	1

6	All-to-All Broadcast and Reduction algorithm on a Ring terminates in _____ steps.	A. p B. p+1 C. p-1 D. p*p	C	2	3	1	3	1
7	In All-to-all Broadcast on a Mesh, operation performs in which sequence?	A. rowwise, rowwise B. rowwise, columnwise C. columnwise, rowwise D. columnwise, columnwise	B	2	3	1	3	3
8	In the _____ operation, a single node sends a unique message of size m to every other node.	A. Scatter B. gather	A	2	3	3	3	1
9	In the _____ operation, a single node collects a unique message from each node.	A. Scatter B. gather	B	2	3	3	3	1
10	Messages get smaller in _____ and stay constant in _____.	A. broadcast, gather B. gather, broadcast C. scatter , broadcast D. scatter, gather	C	2	3	1	3	4
11	The time taken by all-to-all broadcast on a ring is _____.	A. $T= 2t_s(\sqrt{p - 1}) + t_wm(p-1)$ B. $T= (t_s + t_wm)(p-1)$ C. $T= t_s \log_p + t_wm(p-1)$ D. $T= 2t_s(\sqrt{p - 1}) - t_wm(p-1)$	B	2	3	4	3	4
12	The time taken by all-to-all broadcast on a mesh is _____.	A. $T= 2t_s(\sqrt{p - 1}) + t_wm(p-1)$ B. $T= (t_s + t_wm)(p-1)$ C. $T= t_s \log_p + t_wm(p-1)$ D. $T= 2t_s(\sqrt{p - 1}) - t_wm(p-1)$	A	2	3	4	3	4
13	The time taken by all-to-all broadcast on a hypercube is _____.	A. $T= 2t_s(\sqrt{p - 1}) + t_wm(p-1)$ B. $T= (t_s + t_wm)(p-1)$ C. $T= t_s \log_p + t_wm(p-1)$ D. $T= 2t_s(\sqrt{p - 1}) - t_wm(p-1)$	C	2	3	4	3	4
14	_____ is a special permutation in which	A. Left shift B. Right shift	C	2	3	1	3	1

	node $i$ sends a data packet to node $(i + q) \bmod p$ in a $p$ -node ensemble ( $0 \leq q \leq p$ ).	C. Circular shift D. Linear shift						
15	The prefix-sum operation can be implemented using the _____ kernel	A. all-to-all reduction B. all-to-all broadcast C. one-to-all broadcast D. all-to-one broadcast	<b>B</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>1</b>

(Mrs. Dhanashree Phalke)  
Subject Teacher

(Mrs. Vaishali Kolhe)  
Academic Coordinator

( Dr. Kailash Shaw)  
Dept. NBA Coordinator

(Dr. Vinayak Kottawar)  
HOD Computer

**Unit Test IV**

Date: 09/11/2020

Class : BE Computer  
 Academic Year : 2020-21

Div: A  
 Sem : I

Subject : High Performance Computing  
 Exam Date: 11/11/2020

<b>Q. No.</b>	<b>Question Description</b>	<b>Options 28</b>	<b>Correct Answer</b>	<b>Marks</b>	<b>CO</b>	<b>PO</b>	<b>PSO</b>	<b>BTL</b>
1	Select the parameters on which the parallel runtime of a program depends.	A. Input size B. Number of processors C. Communication parameters of the machine D. All of the above	<b>D</b>	<b>2</b>	<b>4</b>	<b>1</b>	<b>3</b>	<b>4</b>
2	The time that elapses from the moment the first processor starts to the moment the last processor finishes execution is called as _____.	A. Serial runtime B. Parallel runtime C. Overhead runtime D. Excess runtime	<b>B</b>	<b>2</b>	<b>4</b>	<b>4</b>	<b>3</b>	<b>4</b>
3	Select how the overhead function ( $T_o$ ) is calculated.	A. $T_o = T_P - T_S$ B. $T_o = p * n T_P - T_S$ C. $T_o = p T_P - T_S$ D. $T_o = T_P - p T_S$	<b>C</b>	<b>2</b>	<b>4</b>	<b>1</b>	<b>3</b>	<b>1</b>
4	What is the ratio of the time taken to solve a problem on a single processor to the time required to solve the same problem on a parallel computer with $p$ identical processing elements?	A. Efficiency B. Overall time C. Speedup D. Scaleup	<b>C</b>	<b>2</b>	<b>4</b>	<b>1</b>	<b>3</b>	<b>4</b>
5	The parallel time for odd-even sort (efficient)	A. 3.75 B. 3.5	<b>B</b>	<b>2</b>	<b>4</b>	<b>1</b>	<b>3</b>	<b>1</b>

	parallelization of bubble sort) is 50 seconds. The serial time for bubblesort is 175 seconds. Evaluate the speedup of bubble sort.	C. 0.33 D. 0.26						
6	Consider the problem of adding $n$ numbers by using $n$ processing elements. The serial time taken is $\Theta(n)$ and parallel time is $\Theta(\log n)$ . Evaluate the efficiency.	A. $E = \Theta(n / \log n)$ B. $E = \Theta(n \log n)$ C. $E = \Theta(\log n / n)$ D. $E = \Theta(1 / \log n)$	<b>D</b>	<b>2</b>	<b>4</b>	<b>1</b>	<b>3</b>	<b>1</b>
7	What will be the efficiency of cost optimal parallel systems?	A. $E = O(n)$ . B. $E = O(1)$ . C. $E = O(p)$ . D. $E = O(n \log n)$ .	<b>B</b>	<b>2</b>	<b>4</b>	<b>1</b>	<b>3</b>	<b>3</b>
8	Which law states that the maximum speedup of a parallel program is limited by the sequential fraction of the initial sequential program?	A. Amdahl's Law B. Flynn's Law C. Moore's Law D. Van Neumann's Law	<b>A</b>	<b>2</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>1</b>
9	Arrange the steps for the Matrix-Vector 2-D partitioning:  i) result vector is computed by performing an all-to-one reduction along the columns. ii) Alignment of the vector $x$ along the principal diagonal of the matrix. iii) Copy the vector	A. i, ii, iii B. ii, iii, i C. iii, i, ii D. ii, i, iii	<b>B</b>	<b>2</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>1</b>

	elements from each diagonal process to all the processes in the corresponding column using $n$ simultaneous broadcasts among all processors in the column.							
10	Arrange the communication sequence in Matrix-Vector 2-D partitioning:  i) all-to-one reduction in each row ii) one-to-all broadcast of each vector element among the $n$ processes of each column iii) one-to-one communication to align the vector along the main diagonal	A. i, ii, iii B. ii, iii, i C. iii, ii, i D. ii, i, iii	C	2	4	1	3	4
11	Parallel time in Rowwise 1-D Partitioning of Matrix-Vector Multiplication where p=n is ____.	A. $\Theta(1)$ B. $\Theta(n \log n)$ C. $\Theta(n^2)$ D. $\Theta(n)$	D	2	4	4	3	4
12	What are the sources of overhead in parallel programs?	A. Interprocess interaction B. Idling C. Excess computation D. All of the above	D	2	4	4	3	4
13	What are the performance metrics of parallel systems?	A. Execution time B. Total parallel overhead C. Speedup	E	2	4	4	3	4

		D. Efficiency E. All of the above						
14	The isoefficiency function determines the ease with which a parallel system can maintain a constant efficiency. True or false?	A. True B. False	<b>A</b>	<b>2</b>	<b>4</b>	<b>1</b>	<b>3</b>	<b>1</b>
15	Which matrix-matrix multiplication algorithm uses a 3-D partitioning?	A. Cannon's algorithm B. DNS algorithm C. Both of the above D. None of the above	<b>B</b>	<b>2</b>	<b>4</b>	<b>1</b>	<b>3</b>	<b>1</b>

(Mrs. Dhanashree Phalke)  
Subject Teacher

(Mrs. Vaishali Kolhe)  
Academic Coordinator

( Dr. Kailash Shaw)  
Dept. NBA Coordinator

(Dr. Vinayak Kottawar)  
HOD Computer

**Prelim Exam**

Date: 29/12/2020

Class : BE Computer  
 Academic Year : 2020-21

Div: A & B  
 Sem : I

Subject : High Performance Computing  
 Exam Date: 31/12/2020

<i>Q. No.</i>	<i>Question Description</i>	<i>Options</i>	<i>Corre ct Answ er</i>	<i>Marks</i>	<i>CO</i>	<b>PO</b>	<b>PSO</b>	<b>BTL</b>
1	Which of the following is the type of parallelism?	<b>a. Bit level parallelism</b> <b>b. Instruction level parallelism</b> <b>c. Loop level parallelism</b> <b>d. All of the above</b>	D	1	1	<b>1,1</b> 2	1	2
2	Which of the parallelism is used by VLIW	<b>a. Bit level parallelism</b> <b>b. Instruction level parallelism</b> <b>c. Loop level parallelism</b> <b>d. Task level Parallelism</b>	B	1	1	<b>1,1</b> 2	1	2
3	Tendency of a software process to access information items whose addresses are near one another known as	<b>a. Spatial Locality</b> <b>b. Temporal locality</b> <b>c. Permanent Locality</b> <b>d. Sequential Locality</b>	a	1	1	<b>1</b>	1	1
4	Parallel Computers are classified based on Flynn's taxonomy which among the following options does not come under this	<b>a. SISD</b> <b>b. SIMD</b> <b>c. MIMD</b> <b>d. SIPD</b>	d	1	1	<b>1,1</b> 2	1	1
5	Which among the following is the popular multistage network	<b>a. Hypercube</b> <b>b. Omega</b>	b	1	1	<b>1</b>	1	2

		<b>c. Gamma</b>  <b>d. K-D Mesh</b>						
6	The multicore architecture that consists of dedicated application specific processor cores that would target the issue of running variety of applications to be executed on a computer.	<b>a. Homogeneous core architecture.</b>  <b>b. Heterogeneous core architecture.</b>  <b>c. Polaris core architecture</b>  <b>d. None of the above</b>	<b>b</b>	1	1	<b>1</b>	<b>1</b>	<b>3</b>
7	Decomposition of computation into a small number of large task is	<b>a. Fine grained granularity</b>  <b>b. course grained granularity</b>  <b>c. coarse grained granularity</b>  <b>d. task grained granularity</b>	<b>C</b>	1	2	<b>1</b>	<b>3</b>	<b>1</b>
8	Which among the following is the type of decomposition	<b>a. Data-decomposition</b>  <b>b. Hybrid decomposition</b>  <b>c. Speculative decomposition</b>  <b>d. All of the above</b>	<b>D</b>	1	2	<b>1,1 2</b>	<b>3</b>	<b>2</b>
9	The 15-puzzle problem uses which type of decomposition	<b>a. Data decomposition</b>  <b>b. Exploratory decomposition</b>  <b>c. Speculative decomposition</b>  <b>d. Recursive decomposition</b>	<b>B</b>	1	2	<b>1,4 12</b>	<b>3</b>	<b>2</b>

10	An interaction pattern is considered to be _____ if it has some structure that can be exploited for efficient implementation	<ul style="list-style-type: none"> <li><b>a. Structured interaction</b></li> <li><b>b. unstructured interaction</b></li> <li><b>c. Regular interaction</b></li> <li><b>d. Irregular interaction</b></li> </ul>	C	1	2	<b>1,1 2</b>	<b>3</b>	<b>2</b>
11	The mapping in which tasks are distributed to processes during execution is called as_____	<ul style="list-style-type: none"> <li><b>a. Dynamic mapping</b></li> <li><b>b. Static mapping</b></li> <li><b>c. Pre-execution mapping</b></li> <li><b>d. In-process mapping</b></li> </ul>	a	1	2	<b>1</b>	<b>1</b>	<b>1</b>
12	The parallel algorithm model in which mapping of tasks is done dynamically where pointer to tasks is stored in physically shared list/priority queue/hash table/tree is called	<ul style="list-style-type: none"> <li><b>a. The data parallel model</b></li> <li><b>b. Producer consumer model</b></li> <li><b>c. The task graph model</b></li> <li><b>d. Work pool model</b></li> </ul>	d	1	2	<b>1,2</b>	<b>1</b>	<b>2</b>
13	The world's first GPU is marketed by NVIDIA in 1999 is	<ul style="list-style-type: none"> <li><b>a. GeForce 356</b></li> <li><b>b. GeForce 256</b></li> <li><b>c. GeForce 3800</b></li> <li><b>d. GeForce 956</b></li> </ul>	B	1	6	<b>5</b>	<b>3</b>	<b>1</b>
14	The operation in which data from all processes are combined at a single destination process is	<ul style="list-style-type: none"> <li><b>a. All to one reduction</b></li> <li><b>b. All to all reduction</b></li> <li><b>c. one to all reduction</b></li> <li><b>d. None of the above</b></li> </ul>	A	1	3	<b>1</b>	<b>1</b>	<b>2</b>
15	In scatter operation a single node sends a unique message to every node is also called as	<ul style="list-style-type: none"> <li>a. One-to-one personalized communication</li> <li>b. One-to-all broadcast</li> </ul>	C	1	3	<b>1</b>	<b>1</b>	<b>2</b>

		communication c. One-to-all personalized communication <b>d. all-to-all personalized communication</b>						
16	Single port communication node can communicate on all the channels connected to it and provides apparent speedup	a. True b. False	<b>B</b>	1	3	<b>1</b>	<b>1</b>	<b>1</b>
17	Symmetric multiprocessors architecture are sometimes known as	a. <b>Uniform memory access</b>  b. <b>Static memory access</b>  c. <b>Variable memory access</b>  d. <b>All of the above</b>	<b>A</b>	1	3	<b>1</b>	<b>1</b>	<b>1</b>
18	Heuristic is way of trying	a. <b>To discover something or an idea embedded in a program</b>  b. <b>To search and measure how far a node in a search tree seems to be from a goal</b>  c. <b>To compare two nodes in a search tree to see if one is better than another</b>  d. <b>All of the mentioned</b>	<b>a</b>	1	4	<b>1,2</b>	<b>3</b>	<b>2</b>
19	A * algorithm is based on	a. <b>Breadth-First search</b>  b. <b>Depth-first Search</b>  c. <b>Best first search</b>  d. <b>Hill climbing</b>	<b>C</b>	1	5	<b>1,2</b>	<b>1</b>	<b>2</b>

20	Best – First search can be implemented using the following data structure	<ul style="list-style-type: none"> <li><b>a. Queue</b></li> <li><b>b. Stack</b></li> <li><b>c. Priority Queue</b></li> <li><b>d. Circular Queue</b></li> </ul>	C	1	5	<b>1,2</b>	<b>1</b>	<b>1</b>
21	_____is a measure of the fraction of time for which a processing element is usefully employed	<ul style="list-style-type: none"> <li><b>a. Scalability</b></li> <li><b>b. Efficiency</b></li> <li><b>c. Speedup</b></li> <li><b>d. Isoefficiency</b></li> </ul>	B	1	5	<b>1,2</b>	<b>1</b>	<b>2</b>
22	The _____of a parallel system is a measure of its capacity to increase speedup in proportion to the number of processing elements	<ul style="list-style-type: none"> <li><b>A. speedup</b></li> <li><b>B. Cost</b></li> <li><b>C. Efficiency</b></li> <li><b>D. Scalability</b></li> </ul>	D	1	3	<b>1,1 2</b>	<b>1</b>	<b>2</b>
23	_____helps us determine the best algorithm/architecture combination for a particular problem without explicitly analyzing all possible combinations under all possible co	<ul style="list-style-type: none"> <li><b>a. Isoefficiency Metric of scalability</b></li> <li><b>b. Efficiency metric of scalability</b></li> <li><b>c. Cost metric of scalability</b></li> <li><b>d. None of the above</b></li> </ul>	A	1	3	<b>1,3</b>	<b>1</b>	<b>2</b>
24	It is defined as a ratio of the time taken to solve a problem on a single processing element to the time computer with p identical processing elements	<ul style="list-style-type: none"> <li><b>a. Total parallel overhead</b></li> <li><b>b. Efficiency</b></li> <li><b>c. Cost</b></li> <li><b>d. speedup</b></li> </ul>	D	1	3	<b>1,1 2</b>	<b>1</b>	<b>1</b>
25	In Practice a speedup greater than p is sometimes observed. It is called as _____	<ul style="list-style-type: none"> <li><b>a. scalability effect</b></li> <li><b>b. superscalar effect</b></li> </ul>	C	1	3	<b>1,2, 12</b>	<b>1</b>	<b>1</b>

		<b>c. super linearity effect</b> <b>d. speedup effect</b>						
26	Odd-even transposition sort is not cost-optimal, because time product is	<b>a. <math>\theta(n^2)</math></b> <b>b. <math>\theta(n^{\log n})</math></b> <b>c. <math>O(n^3)</math></b> <b>d. <math>O(n+\log n)</math></b>	A	1	5	<b>1,2, 5</b>	<b>3</b>	<b>3</b>
27	The quicksort algorithm, which has an average complexity of	<b>a. <math>O(n^3)</math></b> <b>b. <math>O(n+\log n)</math></b> <b>c. <math>\theta(n^{\log n})</math></b> <b>d. <math>\theta(n^2)</math></b>	C	1	5	<b>1,2, 5</b>	<b>1</b>	<b>3</b>
28	Parallel code executes in many concurrent Device (GPU) threads across multiple parallel processing elements, called	<b>a. Synchronising multiprocessor</b> <b>b. Streaming multiprocessor</b> <b>c. Scalable multiprocessor</b> <b>d. Summative multiprocessor</b>	B	1	6	<b>1,2, 12</b>	<b>1</b>	<b>2</b>
29	_____ partitions the vertices among different processes and has each process compute the single-source shortest path for all vertices assigned to it	<b>a. Source parallel formulation</b> <b>b. Single partitioned formulation</b> <b>c. Source partitioned formulation</b> <b>d. Shortest path partitioned formulation</b>	C	1	5	<b>1,2, 12</b>	<b>3</b>	<b>2</b>
30	A processor, assigned with a thread block that executes	<b>a. Multithreaded DIMS</b>	B	1	2	<b>1</b>	<b>1</b>	<b>1</b>

	code, which we usually call a	<b>processor</b>  <b>b. Multithreaded SIMD processor</b>  <b>c. Multithreaded queue</b>  <b>d. Multithreaded stack</b>						
31	Processor of system, which can read/write GPU memory, is known as	<b>a. Server</b>  <b>b. Kernel</b>  <b>c. Guest</b>  <b>d. Host</b>	<b>D</b>	1	6	<b>1</b>	<b>1</b>	<b>1</b>
32	CUDA stands for	<b>a. Compute uniform device architecture</b>  <b>b. Computing universal device architecture</b>  <b>c. Computer unicode device architecture</b>  <b>d. Compute unified device architecture</b>	<b>D</b>	1	6	<b>1,2, 5</b>	<b>2</b>	<b>1</b>
33	The device that are being used primarily for database, file server and mostly for web application are known as	<b>a. Servers</b>  <b>b. Desktops</b>  <b>c. Tablets</b>  <b>d. Supercomputers</b>	<b>A</b>	1	1	<b>1</b>	<b>1</b>	<b>1</b>
34	GPU are designed for running a large number of complex tasks	<b>a. True</b>  <b>b. False</b>	<b>B</b>	1	6	<b>1,2</b>	<b>1</b>	<b>1</b>
35	The parallel algorithm design contains a number of processes where one process may send the identical data to all other processes is called as	<b>a. All to one broadcast</b>  <b>b. All to all broadcast</b>  <b>c. One to all broadcast</b>  <b>d. None of these</b>	<b>C</b>	1	3	<b>1</b>	<b>1</b>	<b>2</b>
36	The efficient utilization can be done by devising a	<b>a. Recursive doubling</b>  <b>b. Recursive</b>		1	3	<b>1</b>	<b>1</b>	<b>1</b>

	broadcasting algorithm with the method known as	c. Scatter and Gather d. None of these	a					
37	The balanced tree is mapped neutrally from the hypercube algorithm for one-to-all broadcast where intermediate are the _____ and each leaf nodes are the _____	a. switching nodes, processing nodes <b>b. processing nodes, switching nodes</b>	a	1	3	<b>1,1</b> 2	1	2
38	Finding prefix-sum operation is also called as scan operation	a. True <b>b. False</b>	a	1	3	<b>1,1</b> 2	1	1
39	All to all personalized communication is also called as	a. Scan operation b. Total exchange method c. None of these	B	1	3	<b>1,1</b> 2	1	2
40	On which network broadcast and reduction operations performed in two steps: 1. Operations along with row 2. Operations along with column	a. Ring b. Hypercube c. Linear array <b>d. Mesh</b>	d	1	3	<b>1,1</b> 2	1	2
41	Gather operation is also called as all to one reduction	a. True <b>b. False</b>	b	1	3	<b>1,8</b>	1	1
42	The method which is used in various parallel algorithm like Fourier transform, matrix transpose, some parallel database join operations is called as	a. All-to-all personalized communication b. All-to-all Broadcast c. Total exchange method d. Both a & c	d	1	3	<b>1,1</b> 2	1	1
43	Consider a sequence in which numbers are originally arranged<2,4,5,6,1>, then sequence of Prefix sum will be	a. <2,6,11,17,18> b. <6,15,21,22> c. None of these	a	1	3	<b>4</b>	2	3
44	Select the parameters on which the parallel runtime of a program depends.	A. input size B. number of processors C.	D	<b>1</b>	<b>4</b>	1	<b>3</b>	<b>4</b>

		ommunication parameters of the machine D. ll of the above						
45	The time that elapses from the moment the first processor starts to the moment the last processor finishes execution is called as _____.	A. Serial runtime B. Parallel runtime C. Overhead runtime D. Excess runtime	B	1	4	4	3	4
46	Select how the overhead function ( $T_o$ ) is calculated.	A. $T_o = T_p - T_s$ B. $T_o = p * n T_p - T_s$ C. $T_o = p T_p - T_s$ D. $T_o = T_p - p T_s$	C	1	4	1	3	1
47	The parallel time for odd-even sort (efficient parallelization of bubble sort) is 50 seconds. The serial time for bubble sort is 175 seconds. Evaluate the speedup of bubble sort.	A. 3.75 B. 3.5 C. 0.33 D. 0.26	B	1	4	1	3	1
48	Consider the problem of adding $n$ numbers by using $n$ processing elements. The serial time taken is $\Theta(n)$ and parallel time is $\Theta(\log n)$ . Evaluate the efficiency.	A. $E = \Theta(n / \log n)$ B. $E = \Theta(n \log n)$ C. $E = \Theta(\log n / n)$ D. $E = \Theta(1 / \log n)$	D	1	4	1	3	1
49	What will be the efficiency of cost optimal parallel systems?	A. $E = O(n)$ . B. $E = O(1)$ .	B	1	4	1	3	3

		C. $E = O(p)$ .  D. $E = O(n \log n)$ .						
50	Which law states that the maximum speedup of a parallel program is limited by the sequential fraction of the initial sequential program?	A. Amdahl's Law  B. Flynn's Law  C. Moore's Law  D. Van Neumann's Law	<b>A</b>	<b>1</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>1</b>
51	Arrange the steps for the Matrix-Vector 2-D partitioning  i) result vector is computed by performing an all-to-one reduction along the columns.  ii) Alignment of the vector $x$ along the principal diagonal of the matrix.  iii) Copy the vector elements from each diagonal process to all the processes in the corresponding column using $n$ simultaneous broadcasts among all processors in the column.	A. i, ii, iii  B. ii, iii, i  C. iii, i, ii  D. ii, i, iii	<b>B</b>	<b>1</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>1</b>
52	Arrange the communication sequence in Matrix-Vector 2-D partitioning:  i) all-to-one reduction in each row  ii) one-to-all broadcast of each vector element among the $n$ processes of each column  iii) one-to-one	A. i, ii, iii  B. ii, iii, i  C. iii, ii, i  D. ii, i, iii	<b>C</b>	<b>1</b>	<b>4</b>	<b>1</b>	<b>3</b>	<b>4</b>

	communication to align the vector along the main diagonal							
53	Parallel time in Rowwise 1-D Partitioning of Matrix-Vector Multiplication where p=n is ____.	A. $\Theta(1)$ B. $\Theta(n \log n)$ C. $\Theta(n^2)$ D. $\Theta(n)$	D	1	4	4	3	4
54	NVIDIA thought that ‘unifying theme’ of every forms of parallelism is the	a. CDA thread b. PTA thread c. CUDA thread d. CUD thread	c	1	6	1,2, 12	1	2
55	Thread being blocked altogether and being executed in sets of 32 threads, called a	a. Thread block b. 32 thread c. 32 block d. Unit block	a	1	6	1,2, 12	1	2
56	Length of a vector operation in a real program is often	a. Known b. Unknown c. Visible d. Invisible	a	1	6	1,2, 12, 6	1	3
57	A code, known as grid which runs on a GPU consisting of a set of	a. 32 thread b. Unit block c. 32 block d. Thread block	d	1	6	1,1 2,5	1	1
58	NVDIA unvield the industrys first directX 10 GPU is_____	a. GTX 1050	b	1	6	1,1 2,5	1	1

		b. GeForce 8800 GTX c. GeForce GTX 1080 d. GTX 1060				1		
59	The number of instructions being executed defines the	a. Instruction count b. Hit time c. Clock rate d. All above	A	1	2	1	1	1
60	In CUDA Programming kernel is launch using which pair of brackets?	a. <<<>>> b. {{{}{}}} c. ((0)) d. [[[]]]	d	1	6	1,2, 12, 5	3	2
61	In CUDA programming the transfer of data between host and device special function used is ___	a. Memcopy() b. Memorycpy() c. cudaMemcpy() d. cudaMemcpy()	c	1	6	1,2, 12, 5	1	1
62	Streaming multiprocessor in CUDA, divides the thread in a block is called as___	a. WRAP b. Packet c. Grid d. Thread block	a	1	6	1,1 2,5	1	2
63	Sources of overheads in parallel program are	a. Idling b. Interprocess communication c. Excess computation d. All of the above	d	1	3	1,1 2,2	1	2
64	What are the sources of overhead in parallel	A. Interprocess interaction	D	1	4	4	3	4

	programs?	B. Idling C. Excess computation D. All of the above						
65	What are the performance metrics of parallel systems?	A. Execution time B. Total parallel overhead C. Speedup D. Efficiency E. All of the above	E	1	4	4	3	4
66	The isoefficiency function determines the ease with which a parallel system can maintain a constant efficiency. True or false?	A. True B. False	A	1	4	1	3	1
67	Which matrix-matrix multiplication algorithm uses a 3-D partitioning?	A. Cannon's algorithm B. DNS algorithm C. Both of the above D. None of the above	B	1	4	1	3	1
68	A solution representing a parallelism in an algorithm is	<b>A. CDA</b> <b>B. PTA</b> <b>C. CUDA</b> <b>D. CUD</b>	C	1	6	1	1	2
69	Blocking optimization is used to improve temporal locality, for reduce	<b>A. Hit miss</b> <b>B. Misses</b>	B	1	5	1	1	2

		<b>C. Hit rate</b>  <b>D. Cache misses</b>						
70	Data are allocated to disks in the RAID at the	<b>A. Block level</b>  <b>B. Cache level</b>  <b>C. Low level</b>  <b>D. High level</b>	<b>A</b>	1	6	<b>1</b>	<b>1</b>	<b>1</b>
71	In CUDA C programming serial code is executed by__and parallel code is executed by__	<b>a. CPU, CPU</b>  <b>b. GPU,CPU</b>  <b>c. GPU, GPU</b>  <b>d. CPU, GPU</b>	<b>d</b>	1	6	<b>1,2, 12, 5</b>	<b>2</b>	<b>2</b>
72	Kernel function is qualified by the qualifier	<b>a. __local__</b>  <b>b. __universal__</b>  <b>c. __global__</b>  <b>d. A or C</b>	<b>C</b>	1	6	<b>1,3</b>	<b>1</b>	<b>1</b>

(Mrs. D.A. Phalke & Mrs. Neha D. Patil) (Mrs. Vaishali Kolhe) ( Dr. Kailash Shaw) (Dr. Vinayak Kottawar)  
 Subject Teacher Academic Coordinor Dept. NBA Coordinator HOD Computer

## HPC MCQ QB for Insem Examination

### Unit I

1. Conventional architectures coarsely comprise of a\_

- A. A processor
- B. Memory system
- C Data path.
- D All of Above**

2. Data intensive applications utilize\_

- A High aggregate throughput**
- B High aggregate network bandwidth
- C High processing and memory system performance.
- D None of above

3. A pipeline is like\_

- A Overlaps various stages of instruction execution to achieve performance.**
- B House pipeline
- C Both a and b
- D A gas line

4. Scheduling of instructions is determined\_

- A True Data Dependency
- B Resource Dependency
- C Branch Dependency
- D All of above**

5. VLIW processors rely on\_

- A Compile time analysis**
- B Initial time analysis
- C Final time analysis
- D Mid time analysis

6. Memory system performance is largely captured by\_

- A Latency
- B Bandwidth
- C Both a and b**
- D none of above

7. The fraction of data references satisfied by the cache is called\_

**A Cache hit ratio**

- B Cache fit ratio
- B Cache best ratio
- C none of above

8. A single control unit that dispatches the same Instruction to various processors is\_\_

**A SIMD**

- B SPMD
- C MIMD
- D None of above

9. The primary forms of data exchange between parallel tasks are\_\_

A Accessing a shared data space

B Exchanging messages.

**C Both A and B**

- D None of Above

10. Switches map a fixed number of inputs to outputs.

**A True**

B False

## Unit 2

1. The First step in developing a parallel algorithm is\_\_

**A. To Decompose the problem into tasks that can be executed concurrently**

- B. Execute directly
- C. Execute indirectly
- D. None of Above

2. The number of tasks into which a problem is decomposed determines its\_\_

**A. Granularity**

- B. Priority
- C. Modernity
- D. None of above

3. The length of the longest path in a task dependency graph is called\_\_

**A. the critical path length**

- B. the critical data length
- C. the critical bit length
- D. None of above

4. The graph of tasks (nodes) and their interactions/data exchange (edges)\_

- A. Is referred to as a *task interaction graph***  
B. Is referred to as a *task Communication graph*  
C. Is referred to as a *task interface graph*  
D. None of Above
5. Mappings are determined by\_
- A. task dependency  
B. task interaction graphs  
**C. Both A and B**  
D. None of Above
6. Decomposition Techniques are\_
- A. recursive decomposition  
B. data decomposition  
C. exploratory decomposition  
D. speculative decomposition  
**E. All of Above**
7. The *Owner Computes Rule* generally states that the process assigned a particular data item is responsible for\_
- A. All computation associated with it**  
B. Only one computation  
C. Only two computation  
D. Only occasionally computation
8. A simple application of exploratory decomposition is\_
- A. The solution to a 15 puzzle**  
B. The solution to 20 puzzle  
C. The solution to any puzzle  
D. None of Above
9. Speculative Decomposition consist of \_
- A. conservative approaches  
B. optimistic approaches  
**C. Both A and B**  
D. Only B
10. task characteristics include:
- A. Task generation.  
B. Task sizes.  
C. Size of data associated with tasks.  
**D. All of Above**

## Unit 3

1. Group communication operations are built using point-to-point messaging primitives
  - A. **True**
  - B. False
2. Communicating a message of size  $m$  over an uncongested network takes time  $ts + tmw$ 
  - A. **True**
  - B. False
3. The dual of one-to-all broadcast is\_
  - A. **All-to-one reduction**
  - B. All-to-one receiver
  - C. All-to-one Sum
  - D. None of Above
4. A hypercube has\_
  - A.  **$2^d$  nodes**
  - B.  $2d$  nodes
  - C.  $2n$  Nodes
  - D. N Nodes
5. A binary tree in which processors are (logically) at the leaves and internal nodes are routing nodes.
  - A. **True**
  - B. False
6. In All-to-All Broadcast each processor is the source as well as destination.
  - A. **True**
  - B. False
7. The Prefix Sum Operation can be implemented using the\_
  - A. **All-to-all broadcast kernel.**
  - B. All-to-one broadcast kernel.
  - C. One-to-all broadcast Kernel
  - D. Scatter Kernel
8. In the *scatter* operation\_

- A. Single node send a unique message of size m to every other node**
- B. Single node send a same message of size m to every other node
  - C. Single node send a unique message of size m to next node
  - D. None of Above
9. The gather operation is exactly the inverse of the\_
- A. Scatter operation**
- B. Broadcast operation
  - C. Prefix Sum
  - D. Reduction operation
10. In All-to-All Personalized Communication Each node has a distinct message of size m for every other node
- A. True**
- B. False
1. It is \_\_\_\_\_ strength and \_\_\_\_\_ permeability.
- a) High, high
  - b) Low, low
  - c) High, low**
  - d) Low, high
- View Answer**
- Answer: c
- Explanation: It is specifically chosen so as to have particularly appropriate properties for the expected use of the structure such as high strength and low permeability.
2. High Performance concrete works out to be economical.
- a) True**
- b) False
- View Answer**
- Answer: a
- Explanation: High Performance concrete works out to be economical, even though its initial cost is high.
3. HPC is not used in high span bridges.
- a) True
  - b) False**
- View Answer**
- Answer: b
- Explanation: Major applications of high-performance concrete in the field of Civil Engineering constructions have been in the areas of long-span bridges, high-rise buildings or structures, highway pavements, etc.
4. Concrete having 28- days' compressive strength in the range of 60 to 100 MPa.
- a) HPC**

- b) VHPC
- c) OPC
- d) HSC

[View Answer](#)

Answer: a

Explanation: High Performance Concrete having 28- days' compressive strength in the range of 60 to 100 MPa.

5. Concrete having 28-days compressive strength in the range of 100 to 150 MPa.

- a) HPC
- b) VHPC**
- c) OPC
- d) HSC

[View Answer](#)

Answer: b

Explanation: Very high performing Concrete having 28-days compressive strength in the range of 100 to 150 MPa.

6. High-Performance Concrete is \_\_\_\_\_ as compared to Normal Strength Concrete.

- a) Less brittle
- b) Brittle
- c) More brittle**
- d) Highly ductile

[View Answer](#)

Answer: c

Explanation: High-Performance Concrete is more brittle as compared to Normal Strength Concrete (NSC), especially when high strength is the main criteria.

7. The choice of cement for high-strength concrete should not be based only on mortar-cube tests but it should also include tests of compressive strengths of concrete at \_\_\_\_\_ days.

- a) 28, 56, 91**
- b) 28, 60, 90
- c) 30, 60, 90
- d) 30, 45, 60

[View Answer](#)

Answer: a

Explanation: The choice of cement for high-strength concrete should not be based only on mortar-cube tests but it should also include tests of compressive strengths of concrete at 28, 56, and 91 days.

8. For high-strength concrete, a cement should produce a minimum 7-days mortar-cube strength of approximately \_\_\_\_ MPa.

- a) 10
- b) 20

**c) 30**

d) 40

[View Answer](#)

Answer: c

Explanation: For high-strength concrete, a cement should produce a minimum 7-days mortar-cube strength of approximately 30 MPa.

9. \_\_\_\_\_ mm nominal maximum size aggregates gives optimum strength.

a) 9.5 and 10.5

b) 10.5 and 12.5

**c) 9.5 and 12.5**

d) 11.5 and 12.5

[View Answer](#)

Answer: c

Explanation: Many studies have found that 9.5 mm to 12.5 mm nominal maximum size aggregates gives optimum strength.

10. Due to low w/c ratio \_\_\_\_\_

a) It doesn't cause any problems

**b) It causes problems**

c) Workability is easy

d) Strength is more

[View Answer](#)

Answer: b

Explanation: Due to the low w/c ratio, it causes problems so superplasticizers are used.

	<b>marks</b>	<b>question</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>ans</b>
<b>0</b>	1	Interconnection Networks can be classified as?	Both	Dynamic	Static	Direct Network	Both Static and Dynamic.
<b>1</b>	1	Parallel Computers are used to solve which types of problems.	Both	Algorithmic Problems	Optimization Problems	None	This is an explaination.
<b>2</b>	1	How many clocks control all the stages in a pipeline?	One	Three	Four	Five	One clock Is used to control all the stages.
<b>3</b>	1	Main memory in parallel computing is ____?	Shared	Parallel	Fixed	None	Main memory is shared in parallel computing.
<b>4</b>	1	Which of these is not a class of parallel computing architetcture?	Application Checkpointing	Distributed Computing	Symmetric Multiprocessing	Multicore Computing	Ans- (d)- Application checkpointing. is not a class of parallel computer architecture.
<b>5</b>	1	Parallel Computing software solutions and Techniques includes:	All	Automatic Parallelization	Parallel Programming languages.	Application Checkpointing	Parallel computing software solutionincludes all of the following.. This is an explanation
<b>6</b>	2	The Processors are connected to the memory through a set of?	Switches	Cables	Buses	Registers	The Processors are connected thru. the switches.
<b>7</b>	2	Superscalar Architetcture has how many execution units?	Two	One	Three	Four	This is an explaination.
<b>8</b>	2	What is used to hold the intermediate output in a pipeline	Intermediate Register	Cache	RAM	ROM	The Intermediate Registers are used to hold the output.
<b>9</b>	2	Which oranization performs sequencing of Human Genome?	International Human Genome Sequencing and Consortium	International Sequencing and Consortium for Human Genome	Human Genome Sequencing and Consortium, Org.	Genome Sequencing for Humans and Consortium, Org.	This is an explaination.
<b>10</b>	2	There are how many stages in RISC Processor?	Five	Three	Two	Six	Ans(c)- Five stages are there in a RISC processor.
<b>11</b>	2	Over the last decade, The DRAM access time has improved at what rate per year?	0.1	0.2	0.15	None of the above	The DRAM acess time rate has improved at a rate of 10% over the last decade.

	marks	question	A	B	C	D	ans
12	2	Which memory acts as low-latency high bandwidth storage?	Cache	Register	DRAM	EPROM	Cache acts as low latency high bandwidth storage .This is an explanation.
13	2	Which processor architecture is this?	SIMD	MIMD	MISD	MIMD	This is an explaination.
14	2	Which core processor is this?	Quad-Core	Dual-Core	Octa-Core	Single-Core	This diagram shows Quad-Core.
15	2	Which of these is not a scalable design principle?	Data Caching	Decomposition	Simplification	Parsimony	Data Caching is not a principle of scable design.
16	2	The distance between any two nodes in Bus Based network is?	O(1)	O(n Logn)	O(N)	O(n^2)	O(1) is the ditance between any two nodes.
17	2	Early SIMD computers include:	All	MPP	CM-2	Illiac IV	All of these are early staged SIMD parallel computers.
18	2	This is which configuration in Omega networks.	Pass-through	Cross-Over	Shuffle	None	This is called Pass-through configuration.
19	2	Automatic Parallelization technique doesn't includes:	Share Memory	Analyse	Schedule	Parse	Parallelization includes parse, analyse schedule and code generation.
20	2	The Pentium 4 or P4 processor has how many stage pipeline?	20	15	18	10	The P4 processor has 20 staged pipeline. This is an explanation.
21	3	Which protocol is not used to remove concurrent writes?	Identify	Priority	Common	Sum	Sum, Priority and common are used to remove concurrent writes.
22	3	EREW PRAM stands for?	Exclusive Read and Exclusive Write	Erasable Read and Erasable Write PRAM	Easily Read and Easily Write	None	EREW stands for Exclusive Read and Exclsiuve Write PRAM.
23	3	During each clock cycle, multiple instructions are piped into the processor in_____?	Parallel	Series	Both a and b	None	Multiple Instuctiön are piped in parallel. This is an explanation.
24	3	Which Interconnection Network uses this equation.	Multistage Networks	Cross-Bar	Dynamic Networks	Bus-Staged	Multistaged Network uses this eqn.

	marks	question	A	B	C	D	ans
25	3	How many types of parallel computing are available from both proprietary and open source parallel computing vendors?	4	2	3	6	There are generally four types of parallel computing, available from both proprietary and open source parallel computing vendors.
26	3	If a piece of data is repeatedly used, the effective latency of this memory system can be reduced by the cache. The fraction of data references satisfied by the cache is called?	Hit Ratio	Memory ratio	Hit Fraction	Memory Fraction.	If a piece of data is repeatedly used, the effective latency of this memory system can be reduced by the cache. The fraction of data references satisfied by the cache is called the cache hit ratio.
27	3	Superscalar Architecture can create problem in?	Scheduling	Phasing	Data Extraction	Data-Compiling	Superscalar Architecture can cause problems in CPU scheduling.
28	3	In cut-through routing, a message is broken into fixed size units called?	Flits	Flow Digits	Control Digits	All	In cut-through routing, a message is broken into fixed size units called flits.
29	3	The total communication time for cut-through routing is?	A	B	C	D	This is an explanation.
30	1	The Disadvantage of GPU Pipeline is?	Load-balancing	Data balancing	Process balancing	All of the above	This is an explanation.
31	1	Examples of GPU Processors are:	Both	AMD Processors	NVIDIA	None	Both AMD and NVIDIA.
32	1	Simultaneous execution of different programs on a data stream is called?	Stream Parallelism	Data Execution	Data-parallelism	None	Simultaneous execution of different programs on a data stream is called Stream Parallelism.
33	1	Early GPU controllers were known as?	Video Shifters	GPU Shifters	GPU Controllers	Video-Movers	This is an Explanation.
34	1	_____ development is a critical component of problem solving using computers?	Algorithm	Code	Pseudocode	Problem	Algorithm development is a critical component of problem solving using computers

	marks	question	A	B	C	D	ans
35	1	GPU stands for?	Graphics Processsing Unit	Graphical Processing Unit	Gaming Processing Unit	Graph Processing Unit	This is an Explaination.
36	1	What leads to concurrency?	Parallelism	Serial Processing	Decomposition	All	Parallelism leads naturally to Concurrency. For example, Several processes trying to print a file on a single printer.
37	2	The process of determining which screen-space pixel locations are covered by each\triangle is known as?	Rasterization	Pixelisation	Fragmentation	Space-Determining Process	Rasterization is the process of determining which screen-space pixel locations are covered by each\triangle.
38	2	The programmable units of the GPU follow which programming model?	SPMD	MISD	MIMD	SIMD	The programmable units of the GPU follow a single program multiple-data (SPMD) programming model.
39	2	Which space can ease the programming effort, especially if the distribution of data is different in different phases of the algorithm?	Shared Address	Parallel Address	Data- Address	Series-Address	Shared Address space can ease the programming effort, especially if the distribution of data is different in different phases of the algorithm.
40	2	Which are the hardware units that physically perform computations?	Processssor	ALU	CPU	CU	Processors are the hardware units that physically perform computations
41	2	Examples of Graphics API are?	All	DirectX	CUDA	Open-CL	All of the these are examples of Graphics API
42	2	The mechanism by which tasks are assigned to processes for execution is called ____?	Mapping	Computation	Process	None	The mechanism by which tasks are assigned to processes for execution is called mapping.

	marks	question	A	B	C	D	ans
43	2	A decomposition into a large number of small tasks is called _____ granularity.	Fine- grained	Coarse-grained	Vector-granied	All	A decomposition into a large number of small tasks is called fine-grained granularity.
44	2	Identical operations being applied concurrently on different data items is called?	Data- Parallelism	Parallelism	Data Serialsm	Concurrency	Identical operations being applied concurrently on different data items is called Data Parallelism.
45	2	System which do not have parallel processsing capabiities?	SISD	SIMD	MISD	MIMD	This is the explainantion.
46	2	The time and the location in the program of a static one-way interaction is known as ?	Priori	Polling	Decomposition	Execution	The time and the location in the program of a static one-way interaction is known a priori.
47	2	Memory access in RISC architecture is limited to which instructions?	STA and LDA	CALL and RET	Push and POP	MOV and JMP	This is the explaination.
48	2	Which Algorithms can be implemented in both shared-address-space and message-passing paradigms?	Data-Parallel Algo.	Quick-Sort Algo.	Data Algorithm	Bubble Sort Algo.	Data Parallel algorithms can be implemented in both shared-address-space and message-passing paradigms
49	2	Which type of Distribution is this?	Randomized Block Distribution	Block-Cyclic Distribution	Cyclic Distribution	None	This figure shows Randomized Block Distribution.
50	2	An abstraction used to express such dependencies among tasks and their relative order of execution is known as _____?	Task- Dependency Graph.	Dependency Graph.	Time- Dependency Graph	None	An abstraction used to express such dependencies among tasks and their relative order of execution is known as a task-dependency graph.

	marks	question	A	B	C	D	ans
51	3	Which is the simplest way to distribute an array and assign uniform contiguous portions of the array to different processes?	Block Distribution	Array Distribution	Process Distribution	All	Block distributions are some of the simplest ways to distribute an array and assign uniform contiguous portions of the array to different processes
52	3	An example of a decomposition with a regular interaction pattern is?	Image-dithering problem.	Travelling Salesman Problem	Time-complexity Problems	8 Queen problem.	An example of a decomposition with a regular interaction pattern is the problem of image dithering.
53	3	A feature of a task-dependency graph that determines the average degree of concurrency for a given granularity is	Critical-path	Process-path	Granularity.	Concurrency	A feature of a task-dependency graph that determines the average degree of concurrency for a given granularity is critical path.
54	3	The shared-address-space programming paradigms can handle which interactions?	Both	Two way	One way	None	The shared-address-space programming paradigms can handle both one-way and two-way interactions.
55	3	Which distribution can result in an almost perfect load balance due to the extreme fine-grained underlying decomposition.	Cyclic Distribution.	Array Distribution	Block-Cyclic Distribution	Block Distribution.	Cyclic Distribution can result in an almost perfect load balance due to the extreme fine-grained underlying decomposition.
56	3	Data sharing interactions can be categorized as _____ interactions?	Both	Read-Write	Read only	None	Data sharing interactions can be categorized as either read-only or read-write interactions

	marks	question	A	B	C	D	ans
57	3	What is the way of structuring a parallel algorithm by selecting a decomposition and mapping technique and applying the appropriate strategy to minimize interactions called?	Algorithm Model	Parallel Model	Data Model	Mapping Model	Algo. Model is a way of structuring a parallel algorithm by selecting a decomposition and mapping technique and applying the appropriate strategy to minimize interactions.
58	3	Which Algorithm is this?	Serial column based Algo.	Column-Algorithm	Bubble Sort Algo.	None.	This is Serial Column based algorithm.
59	3	Algorithms based on the task graph model include:	All	Matrix-Factorization	Parallel QuickSort	Quicksort	This is an Explaination.
60	1	Which model permits simultaneous communication on all the channels connected to a node?	All-port communication	One-port communication	Dual-port communication	Quad-port communication	All-port communication model permits simultaneous communication on all the channels connected to a node.
61	1	A process sends the same m-word message to every other process, but different processes may broadcast different messages. It is called?	All to All Broadcast	One to All Broadcast	All to All Reduction	None	This is an Explaination.
62	1	The Matrix is transposed using which operation?	All to All personalized communication	One-to-all personalized communication	All-to-one personalized communication	One to one personalized communication.	This is an Explaination.
63	1	Each node in a two-dimensional wraparound mesh has how many ports?	Four	Two	Three	One	Each node in a two-dimensional wraparound mesh has four ports
64	1	Circular shift is a member of a broader class of global communication operations known as?	Permutation	Combination.	Both a and b	None	This is ann explaination.
65	1	We define _____ as the operation in which node i sends a data packet to node $(i + q) \bmod p$ in a p-node ensemble ( $0 < q < p$ ).	Circular q-shift	Linear shift	Circular shift	Linear q-shift.	We define a circular q-shift as the operation in which node i sends a data packet to node $(i + q) \bmod p$ in a p-node ensemble ( $0 < q < p$ ).

	marks	question	A	B	C	D	ans
66	1	Parallel algorithms often require a single process to send identical data to all other processes or to a subset of them. This operation is known as?	One to All Broadcast	One to One Broadcast	All to One Broadcast	None	Parallel algorithms often require a single process to send identical data to all other processes or to a subset of them. This operation is known as One to All Broadcast.
67	1	In which Communication each node sends a distinct message of size m to every other node?	All to All personalized communication	One to One personalized communication	All-to-one personalized communication	One-to-all personalized communication.	This is an Explaination.
68	1	All to All personalized communication operation is not used in a which of these parallel algorithms?	Quick Sort	Matrix-Transpose	Fourier Transformation	Database Join operation	This is an Explaination.
69	1	The Dual of one-to-all broadcast is?	All to one Reduction	All to one Broadcast	One to Many Reduction	All to All Broadcast	The dual of one to all Broadcast is called all to one reduction.
70	1	Reduction on a linear array can be performed by _____ the direction and the sequence of communication?	Reversing	Forwarding	Escaping	Widening	Reduction on a linear array can be performed by simply reversing the direction and the sequence of communication
71	2	This equation is used to solve which topology operations in all to all communications?	Hypercube	Mesh	Ring	Linear-Array	This is an Explaination.
72	2	\nThe communication pattern of all-to-all broadcast can be used to perform _____?	Third Variation of Reduction	Second Variation of Reduction	First Variation of Reduction	Fifth Variation of Reduction	This is an Explaination.
73	2	A single node sends a unique message of size m to every other node. This operation is known as _____?	Scatter	Reduction	Gather	Concatenate	In the scatter operation, a single node sends a unique message of size m to every other node.
74	2	The Algorithm represents which broadcast?	All to All Broadcast	All to All Broadcast	All to All Reduction	One to One Reduction	This is an explanation.
75	2	The message can be broadcast in how many steps?	Log(p)	Log( $p^2$ )	One	Sin(p)	The message can be broadcast in log p steps.
76	2	This equation is used to solve which operations?	All to All personalized communication	One-to-all personalized communication	One to one personalized communication	All-to-one personalized communication.	This is an Explaination.

	marks	question	A	B	C	D	ans
77	2	There are how many computations for $n^2$ words of data transferred among the nodes?	$N^3$	Tan n	$E^n$	Log n	There are $n^3$ computations for $n^2$ words of data transferred among the nodes.
78	2	Scatter Operation is also known as?	One-to-all personalized communication	One-to-one personalized communication	All-to-one personalized communication	All-to-all personalized communication.	Scatter operation is also known as One-to-all personalized communication.
79	2	A Hypercube with 2d nodes can be regarded as a d-dimensional mesh with _____ nodes in each dimension.	Two	One	Three	Four	A hypercube with 2d nodes can be regarded as a d-dimensional mesh with two nodes in each dimension
80	2	One-to-all broadcast and all-to-one reduction are used in several important parallel algorithms including?	All	Gaussian Elimination	Shortest path Algo.	Matrix- Vector multiplication	This is an Explanation.
81	2	Each node of the distributed-memory parallel computer is a _____ shared-memory multiprocessor.	NUMA	UMA	CCMA	None	Each node of the distributed-memory parallel computer is a NUMA shared-memory multiprocessor.
82	2	To perform a q-shift, we expand q as a sum of distinct powers of _____?	2	3	e	Log p	To perform a q-shift, we expand q as a sum of distinct powers of 2 .
83	3	In which implementation of circular shift, the entire row to data set is shifted by	Mesh	Hypercube	Ring	Linear	This is an Explanation
84	3	On a p-node hypercube with all-port communication, the coefficients of tw in the expressions for the communication times of one-to-all and all-to-all broadcast and personalized communication are all smaller than their single-port counterparts by a factor of?	Log(p)	Cos(p)	Sin(p)	$E^p$	On a p-node hypercube with all-port communication, the coefficients of tw in the expressions for the communication times of one-to-all and all-to-all broadcast and personalized communication are all smaller than their single-port counterparts by a factor of $\log p$ .

	marks	question	A	B	C	D	ans
85	3	The Equation represents which analysis in All to All Broadcasts?	Cost Analysis	Time Analysis	Data Model Analysis	Space- Time Analysis	Ans-(c) Cost Analysis.
86	3	On a p-node hypercube, the size of each message exchanged in the i th of the log p steps is?	A	B	C	D	A
87	3	Which broadcast is applied on this 3D hypercube?	One to All Broadcast	One to One Broadcast	All to One Broadcast	All to one Reduction	This figure shows One to All Broadcast being applied on 3D hypercube.
88	3	The Equation represents which analysis in One to All Broadcasts?	Cost Analysis	Time Analysis	Data Analysis	Space Analysis	This is an explanation.
89	3	The time for circular shift on a hypercube can be improved by almost a factor of _____ for large messages.	Log p	Cos(p)	$e^p$	sin p	The time for circular shift on a hypercube can be improved by almost a factor of $\log p$ for large messages.
90	1	The execution time of parallel algorithm doesn't depends upon?	Processor	Input Size	Relative computation	Communication speed	The execution time of a parallel algorithm depends not only on input size but also on the number of processing elements used, and their relative computation and interprocess communication speeds.
91	1	Processing elements in a parallel system may become idle due to many reasons such as:	Both	Synchronization	Load Imbalance	The processing element doesn't become idle.	Both synchronization and load imbalance
92	1	If the scaled-speedup curve is close to linear with respect to the number of processing elements, then the parallel system is considered as?	Scalable	Iso-scalable	Non-Scalable	Scale-Efficient	If the scaled-speedup curve is close to linear with respect to the number of processing elements, then the parallel system is considered scalable

	marks	question	A	B	C	D	ans
93	1	Which system is the combination of an algorithm and the parallel architecture on which it is implemented?	Parallel System	Data- Parallel System	Architecture System	Series System	A parallel system is the combination of an algorithm and the parallel architecture on which it is implemented
94	1	What is defined as the speedup obtained when the problem size is increased linearly with the number of processing elements?	Scalable Speedup	Unscalable Speedup	Superlinearity Speedup	Isoefficiency Speedup	Scalable Speedup defined as the speedup obtained when the problem size is increased linearly with the number of processing elements
95	1	The maximum number of tasks that can be executed simultaneously at any time in a parallel algorithm is called its degree of _____.	Concurrency	Parallelism	Linearity	Execution	The maximum number of tasks that can be executed simultaneously at any time in a parallel algorithm is called its degree of concurrency.
96	1	The isoefficiency due to concurrency in 2-D partitioning is:	$O(p)$	$O(n \log p)$	$O(1)$	$O(n^2)$	This is an explanation.
97	2	The total time collectively spent by all the processing elements over and above that required by the fastest known sequential algorithm for solving the same problem on a single processing element is known as?	Total Overhead	Overhead	Serial Runtime	Parallel Runtime	We define total overhead of a parallel system as the total time collectively spent by all the processing elements over and above that required by the fastest known sequential algorithm for solving the same problem on a single processing element.
98	2	Parallel computations involving matrices and vectors readily lend themselves to data _____.	Decomposition	Composition	Linearity	Parallelism	Parallel computations involving matrices and vectors readily lend themselves to data decomposition.

	marks	question	A	B	C	D	ans
99	2	Parallel 1-D with Pipelining is a _____ algorithm?	Synchronous	Asynchronous	Optimal	Cost-optimal	This is an explanation.
100	2	The serial complexity of Matrix-Matrix Multiplication is:	$\tilde{O}(n^3)$	$O(n^2)$	$O(n)$	$O(n \log n)$	This is an explanation
101	2	What is the problem size for $n \times n$ matrix multiplication?	$\tilde{I}(n^3)$	$\tilde{I}(n \log n)$	$\tilde{I}(n^2)$	$\tilde{I}(1)$	$\tilde{I}(n^3)$ is the problem size.
102	2	The given equation represents which function?	Overhead Function	Parallel Model	Series Overtime	Parallel Overtime	This is an explanation.
103	2	The efficiency of a parallel program can be written as:	A	B	C	D	A
104	2	The total number of steps in the entire pipelined procedure is _____?	$\hat{I}(n)$	$\hat{I}(n^2)$	$\hat{I}(n^3)$	$\hat{I}(1)$	The total number of steps in the entire pipelined procedure is $\hat{I}(n)$
105	2	In Canon's Algorithm, the memory used is?	$\hat{I}(n^2)$	$\hat{I}(n)$	$\hat{I}(n^3)$	$\hat{I}(n \log n)$	This is an explanation.
106	2	Consider the problem of multiplying two $n \times n$ dense, square matrices A and B to yield the product matrix C =:	$A \tilde{\times} B$	$A/B$	$A+B$	$A-B$	Consider the problem of multiplying two $n \times n$ dense, square matrices A and B to yield the product matrix $C = A \tilde{\times} B$ .
107	2	The serial runtime of multiplying a matrix of dimension $n \times n$ with a vector is?	A	B	C	D	A
108	2	_____ is a measure of the fraction of time for which a processing element is usefully employed.	Efficiency	Linearity	Overtime Function	Superlinearity	Efficiency is a measure of the fraction of time for which a processing element is usefully employed.
109	2	When the work performed by a serial algorithm is greater than its parallel formulation or due to hardware features that put the serial implementation at a disadvantage. This phenomena is known as?	Superlinear Speedup	Linear Speedups	Super Linearity	Performance Metrics	This is an explaintion
110	3	The all-to-all broadcast and the computation of $y[i]$ both take time?	$\hat{I}(n)$	$\hat{I}(n \log n)$	$\hat{I}(n^2)$	$\hat{I}(n^3)$	This is an explanation.

	marks	question	A	B	C	D	ans
111	3	If virtual processing elements are mapped appropriately onto physical processing elements, the overall communication time does not grow by more than a factor of	N/p	P/n	N+p	N*p	If virtual processing elements are mapped appropriately onto physical processing elements, the overall communication time does not grow by more than a factor of n/p
112	3	Parallel execution time can be expressed as a function of problem size, overhead function, and the number of processing elements. The Formed eqn is:	A	B	C	D	A
113	3	In 2-D partitioning, the first alignment takes time=?	Ts + twn/ â^sp.\n	Ts - twn/â^sp.\n	Ts*twn/â^sp.\n	Ts/ twn*â^sp.\n	Ts + twn/â^sp.\n
114	3	Using fewer than the maximum possible number of processing elements to execute a parallel algorithm is called _____?	Scaling Down	Scaling up	Scaling	Stimulation	Using fewer than the maximum possible number of processing elements to execute a parallel algorithm is called scaling down.
115	3	Which of the following is a drawback of matrix matrix multiplication?	Memory Optimal	Efficient	Time-bound	Complex	This is an explanation
116	3	Consider the problem of sorting 1024 numbers (n = 1024, log n = 10) on 32 processing elements. The speedup expected is	P/log n	P*log n	P+log n	N*log p	Consider the problem of sorting 1024 numbers (n = 1024, log n = 10) on 32 processing elements. The speedup expected is p/log n
117	3	Consider the problem of adding n numbers on p processing elements such that p < n and both n and p are powers of 2. The overall parallel execution time of the problem is:	$\hat{e}^{TM}((n/p) \log p).$	$\hat{e}^{TM}((n*p) \log p).$	$\hat{e}^{TM}((p/n) \log p).$	$\hat{e}^{TM}((n) \log p).$	Ans-(a)- $\hat{e}^{TM}((n/p) \log p).$
118	3	DNS algorithm has _____ runtime?	$\hat{a},!(n)$	$\hat{a},!(n^2)$	$\hat{a},!(n^3)$	$\hat{a},!(\log n)$	DNS has $\hat{a},!(n)$ runtime

	marks	question	A	B	C	D	ans
119	3	The serial algorithm requires _____ multiplications and additions in matrix-vector multiplication.\n\n	$N^2$	$N^3$	$\log n$	$n \log(n)$	Ans-(b)- $n^2$ . The serial algorithm requires $n^2$ multiplications and additions.\n\n
120	1	The time required to merge two sorted blocks of $n/p$ elements is _____? \n\n	$\hat{O}(n/p)$	$\hat{O}(n)$	$\hat{O}(p/n)$	$\hat{O}(n \log p)$	The time required to merge two sorted blocks of $n/p$ elements is $\hat{O}(n/p)$ . \n\n
121	1	In Parallel DFS, the stack is split into two equal pieces such that the size of the search space represented by each stack is the same. Such a split is called?.	Half-Split	Half-Split	Parallel-Split	None	The stack is split into two equal pieces such that the size of the search space represented by each stack is the same. Such a split is called a half-split.
122	1	To avoid sending very small amounts of work, nodes beyond a specified stack depth are not given away. This depth is called the _____ depth.	Cut-Off	Breakdown	Full	Series	To avoid sending very small amounts of work, nodes beyond a specified stack depth are not given away. This depth is called the cutoff depth.
123	1	In sequential sorting algorithms, the input and the sorted sequences are stored in which memory?	Process Memory	Secondary Memory	Main Memory	External Memory	In sequential sorting algorithms, the input and the sorted sequences are stored in the process's memory
124	1	Each process sends its block to the other process. Now, each process merges the two sorted blocks and retains only the appropriate half of the merged block. We refer to this operation as?	Compare-Split	Split	Compare	Exchange.	Each process sends its block to the other process. Now, each process merges the two sorted blocks and retains only the appropriate half of the merged block. We refer to this operation as compare-split.

	marks	question	A	B	C	D	ans
125	1	Each process compares the received element with its own and retains the appropriate element. We refer this operation as _____?	Compare Exchange	Exchange	Process-Exchange	All	Each process compares the received element with its own and retains the appropriate element. We refer this as compare exchange.
126	1	Which algorithm maintains the unexpanded nodes in the search graph, ordered according to their l-value?	Parallel BFS	Parallel DFS	Both a and b	None	Parallel BFS maintains the unexpanded nodes in the search graph, ordered according to their l-value.
127	1	The critical issue in parallel depth-first search algorithms is the distribution of the search space among the _____?	Processor	Space	Memory	Blocks	The critical issue in parallel depth-first search algorithms is the distribution of the search space among the processors
128	2	Enumeration Sort uses how many processes to sort n elements?	$N^2$	Logn	$N^3$	N	This is an explanation.
129	2	Which sequence is a sequence of elements $\langle a_0, a_1, \dots, a_{n-1} \rangle$ with the property that either (1) there exists an index $i, 0 \leq i \leq n - 1$ , such that $\langle a_0, \dots, a_i \rangle$ is monotonically increasing and $\langle a_{i+1}, \dots, a_{n-1} \rangle$ is monotonically decreasing, or (2) there exists a cyclic shift of indices so that (1) is satisfied.	Bitonic Sequence	Acyclic Sequence	Asymptotic Sequence	Cyclic Sequence.	A bitonic sequence is a sequence of elements $\langle a_0, a_1, \dots, a_{n-1} \rangle$ with the property that either (1) there exists an index $i, 0 \leq i \leq n - 1$ , such that $\langle a_0, \dots, a_i \rangle$ is monotonically increasing and $\langle a_{i+1}, \dots, a_{n-1} \rangle$ is monotonically decreasing, or (2) there exists a cyclic shift of indices so that (1) is satisfied

	marks	question	A	B	C	D	ans
130	2	To make a substantial improvement over odd-even transposition sort, we need an algorithm that moves elements long distances. Which one of these is such serial sorting algorithm?	Shell Sort	Linear Sort	Quick-Sort	Bubble Sort	To make a substantial improvement over odd-even transposition sort, we need an algorithm that moves elements long distances. Shellsort is one such serial sorting algorithm.
131	2	Quick-Sort is a _____ algorithm?	Divide and Conquer	Greedy Approach	Both a and b	None	Quicksort is a Divide and Conquer algorithm.
132	2	The _____ transposition algorithm sorts n elements in n phases (n is even), each of which requires n/2 compare-exchange operations.	Odd-Even	Odd	Even	None	This is an explaination.
133	2	The average time complexity for Bucket Sort is?	$O(n+k)$	$O(n \log(n+k))$	$O(n^3)$	$\hat{O}(n^2)$	The average time complexity for Bucket Sort is $O(n + k)$ .
134	2	A popular serial algorithm for sorting an array of n elements whose values are uniformly distributed over an interval $[a, b]$ is which algorithm?	Bucket Sort	Quick-Sort Algo.	Linear Sort	Bubble-Sort	A popular serial algorithm for sorting an array of n elements whose values are uniformly distributed over an interval $[a, b]$ is the bucket sort algorithm
135	2	Best Case time complexity of Bubble Sort is:	$O(n)$	$O(n^3)$	$O(n \log n)$	$O(n^2)$	Best case complexity of bubblesort is $O(n)$ .

	marks	question	A	B	C	D	ans
136	2	When more than one process tries to write to the same memory location, only one arbitrarily chosen process is allowed to write, and the remaining writes are ignored. This process is called _____ in quick sort.	CRCW-PRAM	PRAM	Partitioning	CRCW	When more than one process tries to write to the same memory location, only one arbitrarily chosen process is allowed to write, and the remaining writes are ignored. It is called CRCW PRAM quick sort algo.
137	2	Average Time Complexity in a quicksort algorithm is:	$O(n \log n)$	$O(n)$	$O(n^3)$	$\hat{O}(n^2)$	This is an explaination.
138	2	The isoefficiency function of Global Round Robin (GRR) is:	$O(p^2 \log p)$	$O(p \log p)$	$O(\log p)$	$O(p^2)$	The isoefficiency function of GRR is $O(p^2 \log p)$
139	2	A _____ is a device with two inputs x and y and two outputs $x'$ and $y'$ in a Sorting Network.	Comparator	Router	Separator	Switch.	A comparator is a device with two inputs x and y and two outputs $x'$ and $y'$
140	2	If T is a DFS tree in G then the parallel implementation of the algorithm runs in _____ time complexity.	$O(t)$	$O(t \log n)$	$O(\log t)$	$O(1)$	If T is a DFS tree in G then the parallel implementation of the algorithm outputs a proof that can be verified in $O(t)$ time complexity.
141	2	In the quest for fast sorting methods, a number of networks have been designed that sort n elements in time significantly smaller than _____?	$\hat{O}(n \log n)$	$\hat{O}(n)$	$\hat{O}(1)$	$\hat{O}(n^2)$	In the quest for fast sorting methods, a number of networks have been designed that sort n elements in time significantly smaller than $\hat{O}(n \log n)$ .
142	2	The average value of the search overhead factor in parallel DFS is less than _____?	One	Two	Three	Four	The average value of the search overhead factor in parallel DFS is less than one
143	3	Parallel runtime for Ring architecture in a bitonic sort is:	$\hat{O}(n)$	$\hat{O}(n \log n)$	$\hat{O}(n^2)$	$\hat{O}(n^3)$	Parallel runtime for Ring architecture in a bitonic sort is $\hat{O}(n)$

	marks	question	A	B	C	D	ans
144	3	The Sequential Complexity of Odd-Even Transposition Algorithm is:	$\hat{O}(n^2)$	$\hat{O}(n\log n)$	$\hat{O}(n^3)$	$\hat{O}(n)$	This is an explanation.
145	3	The Algorithm represents which bubble sort:	Sequential Bubble Sort	Circular Bubble Sort	Simple Bubble Sort	Linear Bubble Sort	This is an explanation.
146	3	Enumeration Sort uses how much time to sort n elements?	$\hat{O}(1)$	$\hat{O}(n\log n)$	$\hat{O}(n^2)$	$\hat{O}(n)$	This is an explanation.
147	3	The _____ algorithm relies on the binary representation of the elements to be sorted.	Radix-sort	Bubble Sort	Quick-Sort	Bucket-Sort	The radix sort algorithm relies on the binary representation of the elements to be sorted.
148	3	Parallel runtime for Mesh architecture in a bitonic sort is:	$\hat{O}(n/\log n)$	$\hat{O}(n)$	$\hat{O}(n^2)$	$\hat{O}(n^3)$	This is an explanation.
149	1	The number of threads in a thread block is limited by the architecture to a total of how many threads per block?	512	502	510	412	The number of threads in a thread block is also limited by the architecture to a total of 512 threads per block
150	1	CUDA Architecture is mainly provided by which company?	NVIDIA	Intel	Apple	IBM	NVIDIA provides CUDA services.
151	1	In CUDA Architecture, what are subprograms called?	Kernel	Grid	Element	Blocks	Subprograms are called kernels.
152	1	What is the fullform of CUDA?	Compute Unified Device Architecture	Computer Unified Device Architecture	Common USB Device Architecture	Common Unified Disk Architecture	CUDA Stands for Compute Unified Device Architecture.
153	2	Which of these is not an application of CUDA Arhitecture?	Thermo Dynamics	Neural Networks	VLSI Stimulation	Fluid Dynamics	CUDA architecture has no use on Thermo Dynamics.
154	2	CUDA programming is especially well-suited to address problems that can be expressed as _____ computations.	Data parallel	Task Parallel	Both a and b	None	CUDA programming is especially well-suited to address problems that can be expressed as dataparallel computations.
155	2	CUDA C/C++ uses which keyword in programming:	global	kernel	Cuda_void	nvcc	This is an explanation.
156	2	CUDA programs are saved with _____ extension.	.cd	.cx	.cc	.cu	This is an explanation

	marks	question	A	B	C	D	ans
157	2	The Kepler K20-X chip block, contains _____ streaming multiprocessors\n(SMs).	15	8	16	7	The Kepler K20X chip block diagram, containing 15 streaming multiprocessors (SMs)
158	2	The Kepler K20X architecture increases the register file size to:	64K	32K	128K	256K	The K20X architecture increases the register file size to 64K
159	2	The register file in a GPU is of what size?	2 MB	1 MB	3MB	1024B	Register size in a GPU is 2MB.
160	2	NVIDIAâ€™s GPU computing platform is not enabled on which of the following product families:	AMD	Tegra	Quadro	Tesla	This is an explaination.
161	2	Tesla K-40 has compute capability of:	3.5	3.2	3.4	3.1	This is an explaination.
162	2	The SIMD unit creates, manages, schedules and executes _____ threads simultaneously to create a warp.	32	16	24	8	The SIMD unit creates, manages, schedules and executes 32 threads simultaneously to create a warp
163	2	Which hardware is used by the host interface to fasten the transfer of bulk data to and fro the graphics pipeline?	Direct Memory Access	Switch	Hub	Memory Hardware	This is an Explaination
164	2	A _____ is a collection of thread blocks of the same thread dimensionality which all execute the same kernel.	Grid	Core	Element	Blcoks	A â€˜gridâ€™ is a collection of thread blocks of the same thread dimensionality which all execute the same kernel
165	2	Active Warps can be classified into how many types?	3	2	4	5	This is an explaination.
166	2	All threads in a grid share the same _____ space.	Global memory	Local Memory	Synchronized Memory	All	All threads in a grid\nshare the same global memory space
167	2	CUDA was introduced in which year?	2007	2006	2008	2010	This is an explaination.

	marks	question	A	B	C	D	ans
168	3	Unlike a C function call, all CUDA kernel launches are:	Asynchronous	Synchronous	Both a and b	None	Unlike a C function call, all CUDA kernel launches are asynchronous
169	3	A warp consists of _____ consecutive threads and all threads in a warp are executed in Single Instruction Multiple Thread (SIMT) fashion.	32	16	64	128	A warp consists of 32 consecutive threads and all threads in a warp are executed in Single Instruction Multiple Thread (SIMT) fashion
170	3	There are how many streaming multiprocessors in CUDA architecture?	16	8	12	4	This is an explanation.
171	3	In CUDA programming, if CPU is the host then device will be:	GPU	Compiler	HDD	GPGPU	This is an explanation.
172	3	Both grids and blocks use the _____ type with three unsigned integer fields.	Dim3	Dim2	Dim1	Dim4	Both grids and blocks use the dim3 type with three unsigned integer fields
173	3	Tesla P100 GPU based on the Pascal GPU Architecture has 56 Streaming Multiprocessors (SMs), each capable of supporting up to _____ active threads.	2048	512	1024	256	Tesla P100 GPU based on the Pascal GPU Architecture has 56 Streaming Multiprocessors (SMs), each capable of supporting up to 2048 active threads.
174	3	The maximum size at each level of the thread hierarchy is _____ dependent.	Device	Host	Compiler	Memory	The maximum size at each level of the thread hierarchy is device dependent.
175	3	Intel I7 has the memory bus of width:	19B	180B	152B	102B	This is an explanation.
176	3	The _____ is the heart of the GPU architecture:	Streaming Multiprocessor	Multiprocessor	CUDA	Compiler	The Streaming Multiprocessor (SM) is the heart of the GPU architecture.

	<b>marks</b>	<b>question</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>ans</b>
<b>177</b>	3	A kernel is defined using the _____ declaration specification	global	host	device	void	A kernel is defined using the\n__global declaration specification
<b>178</b>	3	The function printThreadInfo() is not used to print out which of the following information about each thread:	Memory Allocations	Block Index	Matrix Coordinates	Control-Index	Ans-(d)- Memory Allocations.

Which is alternative options for latency hiding?

- A. Increase CPU frequency
- B. Multithreading
- C. Increase Bandwidth
- D. Increase Memory

ANSWER: B

\_\_\_\_\_ Communication model is generally seen in tightly coupled system.

- A. Message Passing
- B. Shared-address space
- C. Client-Server
- D. Distributed Network

ANSWER: B

The principal parameters that determine the communication latency are as follows:

- A. Startup time (ts) Per-hop time (th) Per-word transfer time (tw)
- B. Startup time (ts) Per-word transfer time (tw)
- C. Startup time (ts) Per-hop time (th)
- D. Startup time (ts) Message-Packet-Size(W)

ANSWER: A

The number and size of tasks into which a problem is decomposed determines the \_\_

- A. Granularity
- B. Task
- C. Dependency Graph
- D. Decomposition

ANSWER: A

Average Degree of Concurrency is...

- A. The average number of tasks that can run concurrently over the entire duration of execution of the process.

- B. The average time that can run concurrently over the entire duration of execution of the process.
- C. The average in degree of task dependency graph.
- D. The average out degree of task dependency graph.

ANSWER: A

Which task decomposition technique is suitable for the 15-puzzle problem?

- A. Data decomposition
- B. Exploratory decomposition
- C. Speculative decomposition
- D. Recursive decomposition

ANSWER: B

Which of the following method is used to avoid Interaction Overheads?

- A. Maximizing data locality
- B. Minimizing data locality
- C. Increase memory size
- D. None of the above.

ANSWER: A

Which of the following is not parallel algorithm model

- A. The Data Parallel Model
- B. The work pool model
- C. The task graph model
- D. The Speculative Model

ANSWER: D

Nvidia GPU based on following architecture

- A. MIMD
- B. SIMD
- C. SISD
- D. MISD

ANSWER: B

What is Critical Path?

- A. The length of the longest path in a task dependency graph is called the critical path length.
- B. The length of the smallest path in a task dependency graph is called the critical path length.
- C. Path with loop
- D. None of the mentioned.

ANSWER: A

Which decompositioin technique uses divide-andconquer strategy?

- A. recursive decomposition
- B. Sdata decomposition
- C. exploratory decomposition
- D. speculative decomposition

ANSWER: A

If there are 6 nodes in a ring topology how many message passing cycles will be required to complete broadcast process in one to all?

- A. 1
- B. 6
- C. 3
- D. 4

ANSWER: 3

If there is 4 X 4 Mesh topology network then how many ring operation will perform to complete one to all broadcast?

- A. 4
- B. 8
- C. 16
- D. 32

ANSWER: 8

Consider all to all broadcast in ring topology with 8 nodes. How many messages will be present with each node after 3rd step/cycle of communication?

- A. 3
- B. 4
- C. 6
- D. 7

ANSWER: 4

Consider Hypercube topology with 8 nodes then how many message passing cycles will require in all to all broadcast operation?

- A. The longest path between any pair of finish nodes.
- B. The longest directed path between any pair of start & finish node.
- C. The shortest path between any pair of finish nodes.
- D. The number of maximum nodes level in graph.

ANSWER: D

Scatter is \_\_\_\_\_.

- A. One to all broadcast communication
- B. All to all broadcast communication
- C. One to all personalised communication
- D. Node of the above.

ANSWER: C

If there is 4X4 Mesh Topology \_\_\_\_\_ message passing cycles will require complete all to all reduction.

- A. 4
- B. 6
- C. 8
- D. 16

ANSWER: C

Following issue(s) is/are the true about sorting techniques with parallel computing.

- A. Large sequence is the issue
- B. Where to store output sequence is the issue
- C. Small sequence is the issue
- D. None of the above

ANSWER: B

Partitioning on series done after \_\_\_\_\_

- A. Local arrangement

- B. Processess assignments

- C. Global arrangement

- D. None of the above

ANSWER: C

In Parallel DFS processes has following roles.(Select multiple choices if applicable)

- A. Donor

- B. Active

- C. Idle

- D. Passive

ANSWER: A

Suppose there are 16 elements in a series then how many phases will be required to sort the series using parallel odd-even bubble sort?

- A. 8

- B. 4

- C. 5

- D. 15

ANSWER: D

Which are different sources of Overheads in Parallel Programs?

- A. Interprocess interactions

- B. Process Idling

C. All mentioned options

D. Excess Computation

ANSWER: C

The ratio of the time taken to solve a problem on a parallel processors to the time required to solve the same problem on a single processor with p identical processing elements.

A. The ratio of the time taken to solve a problem on a single processor to the time required to solve the same problem on a parallel computer with p identical processing elements.

B. The ratio of the time taken to solve a problem on a single processor to the time required to solve the same problem on a parallel computer with p identical processing elements

C. The ratio of number of multiple processors to size of data

D. None of the above

ANSWER: B

Efficiency is a measure of the fraction of time for which a processing element is usefully employed.

A. TRUE

B. FALSE

ANSWER: A

CUDA helps do execute code in parallel mode using \_\_\_\_\_

A. CPU

B. GPU

C. ROM

D. Cash memory

ANSWER: B

In thread-function execution scenario thread is a \_\_\_\_\_

A. Work

B. Worker

C. Task

D. None of the above

ANSWER: B

In GPU Following statements are true

- A. Grid contains Block
- B. Block contains Threads
- C. All the mentioned options.
- D. SM stands for Streaming MultiProcessor

ANSWER: C

Computer system of a parallel computer is capable of \_\_\_\_\_

- A. Decentralized computing
- B. Parallel computing
- C. Centralized computing
- D. All of these

ANSWER: A

In which application system Distributed systems can run well?

- A. HPC
- B. Distributed Framework
- C. HRC
- D. None of the above

ANSWER: A

A pipeline is like ..... ?

- A. an automobile assembly line
- B. house pipeline
- C. both a and b
- D. a gas line

ANSWER: A

Pipeline implements ?

- A. fetch instruction

- B. decode instruction
- C. fetch operand
- D. all of above

ANSWER: D

A processor performing fetch or decoding of different instruction during the execution of another instruction is called \_\_\_\_\_ ?

- A. Super-scaling
- B. Pipe-lining
- C. Parallel Computation
- D. None of these

ANSWER: B

In a parallel execution, the performance will always improve as the number of processors will increase?

- A. True
- B. False

ANSWER: B

VLIW stands for ?

- A. Very Long Instruction Word
- B. Very Long Instruction Width
- C. Very Large Instruction Word
- D. Very Long Instruction Width

ANSWER: A

In VLIW the decision for the order of execution of the instructions depends on the program itself?

- A. True
- B. False

ANSWER: A

Which one is not a limitation of a distributed memory parallel system?

- A. Higher communication time
- B. Cache coherency
- C. Synchronization overheads
- D. None of the above

ANSWER: B

Which of these steps can create conflict among the processors?

- A. Synchronized computation of local variables
- B. Concurrent write
- C. Concurrent read
- D. None of the above

ANSWER: B

Which one is not a characteristic of NUMA multiprocessors?

- A. It allows shared memory computing
- B. Memory units are placed in physically different location
- C. All memory units are mapped to one common virtual global memory
- D. Processors access their independent local memories

ANSWER: D

Which of these is not a source of overhead in parallel computing?

- A. Non-uniform load distribution
- B. Less local memory requirement in distributed computing
- C. Synchronization among threads in shared memory computing
- D. None of the above

ANSWER: B

Systems that do not have parallel processing capabilities are?

- A. SISD
- B. SIMD
- C. MIMD

D. All of the above

ANSWER: A

How does the number of transistors per chip increase according to Moore's law?

- A. Quadratically
- B. Linearly
- C. Cubically
- D. Exponentially

ANSWER: D

Parallel processing may occur?

- A. in the instruction stream
- B. in the data stream
- C. both[A] and [B]
- D. none of the above

ANSWER: C

To which class of systems does the von Neumann computer belong?

- A. SIMD (Single Instruction Multiple Data)
- B. MIMD (Multiple Instruction Multiple Data)
- C. MISD (Multiple Instruction Single Data)
- D. SISD (Single Instruction Single Data)

ANSWER: D

Fine-grain threading is considered as a \_\_\_\_\_ threading?

- A. Instruction-level
- B. Loop level
- C. Task-level
- D. Function-level

ANSWER: A

Multiprocessor is systems with multiple CPUs, which are capable of independently executing different tasks in parallel. In this category every processor and memory module has similar access time?

- A. UMA
- B. Microprocessor
- C. Multiprocessor
- D. NUMA

ANSWER: A

For inter processor communication the miss arises are called?

- A. hit rate
- B. coherence misses
- C. comitt misses
- D. parallel processing

ANSWER: B

NUMA architecture uses \_\_\_\_\_ in design?

- A. cache
- B. shared memory
- C. message passing
- D. distributed memory

ANSWER: D

A multiprocessor machine which is capable of executing multiple instructions on multiple data sets?

- A. SISD
- B. SIMD
- C. MIMD
- D. MISD

ANSWER: C

In message passing, send and receive message between?

- A. Task or processes

- B. Task and Execution
- C. Processor and Instruction
- D. Instruction and decode

ANSWER: A

The First step in developing a parallel algorithm is\_\_\_\_\_?

- A. To Decompose the problem into tasks that can be executed concurrently
- B. Execute directly
- C. Execute indirectly
- D. None of Above

ANSWER: A

The number of tasks into which a problem is decomposed determines its?

- A. Granularity
- B. Priority
- C. Modernity
- D. None of above

ANSWER: A

The length of the longest path in a task dependency graph is called?

- A. the critical path length
- B. the critical data length
- C. the critical bit length
- D. None of above

ANSWER: A

The graph of tasks (nodes) and their interactions/data exchange (edges)?

- A. Is referred to as a task interaction graph
- B. Is referred to as a task Communication graph
- C. Is referred to as a task interface graph
- D. None of Above

ANSWER: A

Mappings are determined by?

- A. task dependency
- B. task interaction graphs
- C. Both A and B
- D. None of Above

ANSWER: C

Decomposition Techniques are?

- A. recursive decomposition
- B. data decomposition
- C. exploratory decomposition
- D. All of Above

ANSWER: D

The Owner Computes Rule generally states that the process assigned a particular data item is responsible for?

- A. All computation associated with it
- B. Only one computation
- C. Only two computation
- D. Only occasionally computation

ANSWER: A

A simple application of exploratory decomposition is\_?

- A. The solution to a 15 puzzle
- B. The solution to 20 puzzle
- C. The solution to any puzzle
- D. None of Above

ANSWER: A

Speculative Decomposition consist of \_?

- A. conservative approaches
- B. optimistic approaches
- C. Both A and B
- D. Only B

ANSWER: C

task characteristics include?

- A. Task generation.
- B. Task sizes.
- C. Size of data associated with tasks.
- D. All of Above

ANSWER: D

Writing parallel programs is referred to as?

- A. Parallel computation
- B. Parallel processes
- C. Parallel development
- D. Parallel programming

ANSWER: D

Parallel Algorithm Models?

- A. Data parallel model
- B. Bit model
- C. Data model
- D. network model

ANSWER: A

The number and size of tasks into which a problem is decomposed determines the?

- A. fine-granularity
- B. coarse-granularity

C. sub Task

D. granularity

ANSWER: A

A feature of a task-dependency graph that determines the average degree of concurrency for a given granularity is its \_\_\_\_\_ path?

A. critical

B. easy

C. difficult

D. ambiguous

ANSWER: A

The pattern of \_\_\_\_\_ among tasks is captured by what is known as a task-interaction graph?

A. Interaction

B. communication

C. optmization

D. flow

ANSWER: A

Interaction overheads can be minimized by\_\_\_\_?

A. Maximize Data Locality

B. Maximize Volume of data exchange

C. Increase Bandwidth

D. Minimize social media contents

ANSWER: A

Type of parallelism that is naturally expressed by independent tasks in a task-dependency graph is called \_\_\_\_\_ parallelism?

A. Task

B. Instruction

C. Data

D. Program

ANSWER: A

Speed up is defined as a ratio of?

- A.  $s = T_s / T_p$
- B.  $S = T_p / T_s$
- C.  $T_s = S / T_p$
- D.  $T_p = S / T_s$

ANSWER: A

Parallel computing means to divide the job into several \_\_\_\_\_?

- A. Bit
- B. Data
- C. Instruction
- D. Task

ANSWER: D

\_\_\_\_\_ is a method for inducing concurrency in problems that can be solved using the divide-and-conquer strategy?

- A. exploratory decomposition
- B. speculative decomposition
- C. data-decomposition
- D. Recursive decomposition

ANSWER: C

The \_\_\_ time collectively spent by all the processing elements  $T_{all} = p \cdot T_P$ ?

- A. total
- B. Average
- C. mean
- D. sum

ANSWER: A

Group communication operations are built using point-to-point messaging primitives?

A. True

B. False

ANSWER: A

Communicating a message of size  $m$  over an uncongested network takes time  $ts + tmw$ ?

A. True

B. False

ANSWER: A

The dual of one-to-all broadcast is ?

A. All-to-one reduction

B. All-to-one receiver

C. All-to-one Sum

D. None of Above

ANSWER: A

A hypercube has?

A.  $2^d$  nodes

B.  $2^d$  nodes

C.  $2^n$  Nodes

D. N Nodes

ANSWER: A

A binary tree in which processors are (logically) at the leaves and internal nodes are routing nodes?

A. True

B. False

ANSWER: A

In All-to-All Broadcast each processor is the source as well as destination?

A. True

B. False

ANSWER: A

The Prefix Sum Operation can be implemented using the ?

- A. All-to-all broadcast kernel.
- B. All-to-one broadcast kernel.
- C. One-to-all broadcast Kernel
- D. Scatter Kernel

ANSWER: A

In the scatter operation ?

- A. Single node send a unique message of size m to every other node
- B. Single node send a same message of size m to every other node
- C. Single node send a unique message of size m to next node
- D. None of Above

ANSWER: A

The gather operation is exactly the inverse of the ?

- A. Scatter operation
- B. Broadcast operation
- C. Prefix Sum
- D. Reduction operation

ANSWER: A

In All-to-All Personalized Communication Each node has a distinct message of size m for every other node ?

- A. True
- B. False

ANSWER: A

Parallel algorithms often require a single process to send identical data to all other processes or to a subset of them. This operation is known as \_\_\_\_\_ ?

- A. one-to-all broadcast
- B. All to one broadcast
- C. one-to-all reduction
- D. all to one reduction

ANSWER: A

In which of the following operation, a single node sends a unique message of size  $m$  to every other node?

- A. Gather
- B. Scatter
- C. One to all personalized communication
- D. Both A and C

ANSWER: D

Gather operation is also known as \_\_\_\_\_?

- A. One to all personalized communication
- B. One to all broadcast
- C. All to one reduction
- D. All to All broadcast

ANSWER: A

one-to-all personalized communication does not involve any duplication of data?

- A. True
- B. False

ANSWER: A

Gather operation, or concatenation, in which a single node collects a unique message from each node?

- A. True
- B. False

ANSWER: A

Conventional architectures coarsely comprise of a?

- A. A processor
- B. Memory system
- C. Data path.
- D. All of Above

ANSWER: D

Data intensive applications utilize?

- A. High aggregate throughput
- B. High aggregate network bandwidth
- C. High processing and memory system performance.
- D. None of above

ANSWER: A

A pipeline is like?

- A. Overlaps various stages of instruction execution to achieve performance.
- B. House pipeline
- C. Both a and b
- D. A gas line

ANSWER: A

Scheduling of instructions is determined?

- A. True Data Dependency
- B. Resource Dependency
- C. Branch Dependency
- D. All of above

ANSWER: D

VLIW processors rely on?

- A. Compile time analysis
- B. Initial time analysis

C. Final time analysis

D. Mid time analysis

ANSWER: A

Memory system performance is largely captured by?

A. Latency

B. Bandwidth

C. Both a and b

D. none of above

ANSWER: C

The fraction of data references satisfied by the cache is called?

A. Cache hit ratio

B. Cache fit ratio

C. Cache best ratio

D. none of above

ANSWER: A

A single control unit that dispatches the same instruction to various processors is?

A. SIMD

B. SPMD

C. MIMD

D. None of above

ANSWER: A

The primary forms of data exchange between parallel tasks are?

A. Accessing a shared data space

B. Exchanging messages.

C. Both A and B

D. None of Above

ANSWER: C

Switches map a fixed number of inputs to outputs?

A. True

B. False

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Computer system of a parallel computer is capable of?

- A. Decentralized computing
- B. Parallel computing
- C. Centralized computing
- D. Decentralized computing
- E. Distributed computing

ANSWER: A

Writing parallel programs is referred to as?

- A. Parallel computation
- B. Parallel processes
- C. Parallel development
- D. Parallel programming

ANSWER: D

Simplifies applications of three-tier architecture is \_\_\_\_\_?

- A. Maintenance

- B. Initiation
- C. Implementation
- D. Deployment

ANSWER: D

Dynamic networks of networks, is a dynamic connection that grows is called?

- A. Multithreading
- B. Cyber cycle
- C. Internet of things
- D. Cyber-physical system

ANSWER: C

In which application system Distributed systems can run well?

- A. HPC
- D. HTC
- C. HRC
- D. Both A and B

ANSWER: D

In which systems desire HPC and HTC?

- A. Adaptivity
- B. Transparency
- C. Dependency
- D. Secretive

ANSWER: B

No special machines manage the network of architecture in which resources are known as?

- A. Peer-to-Peer
- B. Space based
- C. Tightly coupled
- D. Loosely coupled

ANSWER: A

Significant characteristics of Distributed systems have of ?

- A. 5 types
- B. 2 types
- C. 3 types
- D. 4 types

ANSWER: C

Built of Peer machines are over?

- A. Many Server machines
- B. 1 Server machine
- C. 1 Client machine
- D. Many Client machines

ANSWER: D

Type HTC applications are?

- A. Business
- B. Engineering
- C. Science
- D. Media mass

ANSWER: A

Virtualization that creates one single address space architecture that of, is called?

- A. Loosely coupled
- B. Peer-to-Peer
- C. Space-based
- D. Tightly coupled

ANSWER: C

We have an internet cloud of resources In cloud computing to form?

- A. Centralized computing
- B. Decentralized computing
- C. Parallel computing
- D. All of these

ANSWER: D

Data access and storage are elements of Job throughput, of \_\_\_\_\_?

- A. Flexibility
- B. Adaptation
- C. Efficiency
- D. Dependability

ANSWER: C

Billions of job requests is over massive data sets, ability to support known as?

- A. Efficiency
- B. Dependability
- C. Adaptation
- D. Flexibility

ANSWER: C

Broader concept offers Cloud computing .to select which of the following?

- A. Parallel computing
- B. Centralized computing
- C. Utility computing
- D. Decentralized computing

ANSWER: C

Resources and clients transparency that allows movement within a system is called?

- A. Mobility transparency
- B. Concurrency transparency
- C. Performance transparency

D. Replication transparency

ANSWER: A

Distributed program in a distributed computer running a is known as?

- A. Distributed process
- B. Distributed program
- C. Distributed application
- D. Distributed computing

ANSWER: B

Uniprocessor computing devices is called\_\_\_\_\_?

- A. Grid computing
- B. Centralized computing
- C. Parallel computing
- D. Distributed computing

ANSWER: B

Utility computing focuses on a\_\_\_\_\_ model?

- A. Data
- B. Cloud
- C. Scalable
- D. Business

ANSWER: D

What is a CPS merges technologies?

- A. 5C
- B. 2C
- C. 3C
- D. 4C

ANSWER: C

Aberration of HPC?

- A. High-peak computing
- B. High-peripheral computing
- C. High-performance computing
- D. Highly-parallel computing

ANSWER: C

Peer-to-Peer leads to the development of technologies like?

- A. Norming grids
- B. Data grids
- C. Computational grids
- D. Both A and B

ANSWER: D

Type of HPC applications of?

- A. Management
- B. Media mass
- C. Business
- D. Science

ANSWER: D

The development generations of Computer technology has gone through?

- A. 6
- B. 3
- C. 4
- D. 5

ANSWER: D

Utilization rate of resources in an execution model is known to be its?

- A. Adaptation
- B. Efficiency

C. Dependability

D. Flexibility

ANSWER: B

Even under failure conditions Providing Quality of Service (QoS) assurance is the responsibility of?

A. Dependability

B. Adaptation

C. Flexibility

D. Efficiency

ANSWER: A

Interprocessor communication that takes place?

A. Centralized memory

B. Shared memory

C. Message passing

D. Both A and B

ANSWER: D

Data centers and centralized computing covers many and?

A. Microcomputers

B. Minicomputers

C. Mainframe computers

D. Supercomputers

ANSWER: D

Which of the following is an primary goal of HTC paradigm\_\_\_\_\_?

A. High ratio Identification

B. Low-flux computing

C. High-flux computing

D. Computer utilities

ANSWER: C

The high-throughput service provided is measures taken by

- A. Flexibility
- B. Efficiency
- C. Dependability
- D. Adaptation

ANSWER: D

What are the sources of overhead?

- A. Essential /Excess Computation
- B. Inter-process Communication
- C. Idling
- D. All above

ANSWER: D

Which are the performance metrics for parallel systems?

- A. Execution Time
- B. Total Parallel Overhead
- C. Speedup
- D. All above

ANSWER: D

The efficiency of a parallel program can be written as:  $E = Ts / pTp$ . True or False?

- A. True
- B. False

ANSWER: A

The important feature of the VLIW is \_\_\_\_\_?

- A. ILP
- B. Performance
- C. Cost effectiveness

D. delay

ANSWER: A

## **SUB : 410241 HPC**

Which of the following statements are true with regard to compute capability in CUDA

- A. Code compiled for hardware of one compute capability will not need to be re-compiled to run on hardware of another
- B. Different compute capabilities may imply a different amount of local memory per thread
- C. Compute capability is measured by the number of FLOPS a GPU accelerator can compute.

**Answer : B**

True or False: The threads in a thread block are distributed across SM units so that each thread is executed by one SM unit.

- A. True
- B. False

**Answer : B**

The style of parallelism supported on GPUs is best described as

- A. SISD - Single Instruction Single Data
- B. MISD - Multiple Instruction Single Data
- C. SIMD - Single Instruction Multiple Thread

**Answer : C**

True or false: Functions annotated with the `__global__` qualifier may be executed on the host or the device

- A. True
- B. Flase

**Answer : A**

## SUB : 410241 HPC

Which of the following correctly describes a GPU kernel

- A. A kernel may contain a mix of host and GPU code
- B. All thread blocks involved in the same computation use the same kernel
- C. A kernel is part of the GPU's internal micro-operating system, allowing it to act as an independent host

**Answer : B**

Which of the following is *not* a form of parallelism supported by CUDA

- A. Vector parallelism - Floating point computations are executed in parallel on wide vector units
- B. Thread level task parallelism - Different threads execute a different tasks
- C. Block and grid level parallelism - Different blocks or grids execute different tasks
- D. Data parallelism - Different threads and blocks process different parts of data in memory

**Answer :A**

What strategy does the GPU employ if the threads within a warp diverge in their execution?

- A. Threads are moved to different warps so that divergence does not occur within a single warp
- B. Threads are allowed to diverge
- C. All possible execution paths are run by all threads in a warp serially so that thread instructions do not diverge

**Answer : C**

Which of the following does *not* result in uncoalesced (i.e. serialized) memory access on the K20 GPUs installed on Stampede

- A. Aligned, but non-sequential access
- B. Misaligned data access
- C. Sparse memory access

**Answer : A**

## **SUB : 410241 HPC**

Which of the following correctly describes the relationship between Warps, thread blocks, and CUDA cores?

- A. A warp is divided into a number of thread blocks, and each thread block executes on a single CUDA core
- B. A thread block may be divided into a number of warps, and each warp may execute on a single CUDA core
- C. A thread block is assigned to a warp, and each thread in the warp is executed on a separate CUDA core

**Answer : B**

Shared memory in CUDA is accessible to:

- A. All threads in a single block
- B. Both the host and GPU
- C. All threads associated with a single kernel

**Answer : A**

CUDA Architecture CPU consist of

- A. CUDA Libraries
- B. CUDA Runtime
- C. CUDA Driver
- D. All Above

**Answer : D**

CUDA platform works on

- A. C
- B. C++
- C. Fortran
- D. All Above

**Answer : D**

## **SUB : 410241 HPC**

Threads support Shared memory and Synchronization

- A. True
- B. False

**Answer : A**

Application of CUDA are

- A. Fast Video Transcoding
- B. Medical Imaging
- C. Computational Science
- D. Oil and Natural Resources exploration
- E. All Above

**Answer : E**

GPU execute device code

- A. True
- B. False

**Answer : A**

## **SUB : 410241 HPC**

What are the issues in sorting?

- A. Where the Input and Output Sequences are Stored
- B. How Comparisons are Performed
- C. All above

**Answer : C**

The parallel run time of the formulation for Bubble sort is

- A.  $T_p = O(n/p \log n/p) + O(n) + O(n)$
- B.  $T_p = O(n/p \log n/p) + O(n/p \log p) + O(\ln n/p)$
- C. Non of the above

**Answer : A**

What are the variants of Bubble sort?

- A. Shell sort
- B. Quick sort
- C. Odd-Even transposition
- D. Option A & C

**Answer : D**

What is the overall complexity of parallel algorithm for quick sort?

- A.  $T_p = O(n/p \log n/p) + O(n/p \log p) + O(\log^2 p)$
- B.  $T_p = O(n/p \log n/p) + O(n/p \log p)$
- C.  $T_p = O(n/p \log n/p) + O(\log^2 p)$

**Answer : A**

## SUB : 410241 HPC

Formally, given a weighted graph  $G(V, E, w)$ , the ***all-pairs shortest paths*** problem is to find the shortest paths between all pairs of vertices. True or False?

- A. True
- B. False

**Answer : A**

What is true for parallel formulation of Dijkstra's Algorithm?

- A. One approach partitions the vertices among different processes and has each process compute the single-source shortest paths for all vertices assigned to it. We refer to this approach as the ***source-partitioned formulation***.
- B. Another approach assigns each vertex to a set of processes and uses the parallel formulation of the single-source algorithm to solve the problem on each set of processes. We refer to this approach as the ***source-parallel formulation***.
- C. Both are true
- D. Non of these is true

**Answer : C**

Search algorithms can be used to solve discrete optimization problems. True or False ?

- A. True
- B. False

**Answer : A**

Examples of Discrete optimization problems are ;

- A. planning and scheduling,
- B. The optimal layout of VLSI chips,
- C. Robot motion planning,
- D. Test-pattern generation for digital circuits, and logistics and control.
- E. All of above

**Answer : E**

List the important parameters of Parallel DFS

- A. Work- Splitting Strategies
- B. Load balancing Schemes
- C. All of above

**Answer : C**

## **SUB : 410241 HPC**

List the communication strategies for parallel BFS.

- A. Random communication strategy
- B. Ring communication strategy
- C. Blackboard communication strategy
- D. All of above

**Answer : D**

The lower bound on any comparison-based sort of  $n$  numbers is  $\Theta(n \log n)$

- A. True
- B. False

**Answer : A**

In a compare-split operation

- A. Each process sends its block of size  $n/p$  to the other process
- B. Each process merges the received block with its own block and retains only the appropriate half of the merged block
- C. Both A & B

**Answer : C**

In a typical sorting network

- A. Every sorting network is made up of a series of columns
- B. Each column contains a number of comparators connected in parallel
- C. Both A & B

**Answer : C**

Bubble sort is difficult to parallelize since the algorithm has no concurrency

- A. True
- B. False

**Answer : A**

## SUB : 410241 HPC

What are the sources of overhead?

- A. Essential /Excess Computation
- B. Inter-process Communication
- C. Idling
- D. All above

**Answer : D**

Which are the performance metrics for parallel systems?

- A. Execution Time
- B. Total Parallel Overhead
- C. Speedup
- D. Efficiency
- E. Cost
- F. All above

**Answer : F**

The efficiency of a parallel program can be written as:  $E = Ts / pTp$ . True or False?

- A. True
- B. False

**Answer : A**

Overhead function or **total overhead** of a parallel system as the total time collectively spent by all the processing elements over and above that required by the fastest known sequential algorithm for solving the same problem on a single processing element. True or False?

- A. True
- B. False

**Answer : A**

What is Speedup?

- A. A measure that captures the relative benefit of solving a problem in parallel. It is defined as the ratio of the time taken to solve a problem on a single processing element to the time required to solve the same problem on a parallel computer with  $p$  identical processing elements.
- B. A measure of the fraction of time for which a processing element is usefully employed.
- C. None of the above

**Answer : A**

In an ideal parallel system, speedup is equal to  $p$  and efficiency is equal to one. True or False?

- A. True
- B. False

**Answer : A**

## SUB : 410241 HPC

A parallel system is said to be \_\_\_\_\_ if the cost of solving a problem on a parallel computer has the same asymptotic growth (in  $\Theta$  terms) as a function of the input size as the fastest-known sequential algorithm on a single processing element.

- A. Cost optimal
- B. Non Cost optimal

**Answer : A**

Using fewer than the maximum possible number of processing elements to execute a parallel algorithm is called \_\_\_\_\_ a parallel system in terms of the number of processing elements.

- A. Scaling down
- B. Scaling up

**Answer : B**

The \_\_\_\_\_ function determines the ease with which a parallel system can maintain a constant efficiency and hence achieve speedups increasing in proportion to the number of processing elements.

- A. Isoefficiency
- B. Efficiency
- C. Scalability
- D. Total overhead

**Answer : A**

Minimum execution time for adding n numbers is  $T_p = n/p + 2 \log p$  True or False ?

- A. True
- B. False

**Answer : A**

The overhead function  $T_o = pTP - TS$ .

- A. True
- B. False

**Answer : A**

Performance Metrics for Parallel Systems: Speedup(S) = $TS/TP$

- A. True
- B. False

**Answer : A**

Matrix Vector multiplication 2D Partitions requires some basic communication operations

- A. one-to-one communication to align the vector along the main diagonal
- B. one-to-all broadcast of each vector element among the n processes of each column
- C. all-to-one reduction in each row
- D. All Above

**Answer : D**

Which is alternative options for latency hiding?

- A. Increase CPU frequency
- B. Multithreading
- C. Increase Bandwidth
- D. Increase Memory

ANSWER: B

\_\_\_\_\_ Communication model is generally seen in tightly coupled system.

- A. Message Passing
- B. Shared-address space
- C. Client-Server
- D. Distributed Network

ANSWER: B

The principal parameters that determine the communication latency are as follows:

- A. Startup time (ts) Per-hop time (th) Per-word transfer time (tw)
- B. Startup time (ts) Per-word transfer time (tw)
- C. Startup time (ts) Per-hop time (th)
- D. Startup time (ts) Message-Packet-Size(W)

ANSWER: A

The number and size of tasks into which a problem is decomposed determines the —

- A. Granularity
- B. Task
- C. Dependency Graph
- D. Decomposition

ANSWER: A

Average Degree of Concurrency is...

- A. The average number of tasks that can run concurrently over the entire duration of execution of the process.
- B. The average time that can run concurrently over the entire duration of execution of the process.
- C. The average in degree of task dependency graph.
- D. The average out degree of task dependency graph.

ANSWER: A

Which task decomposition technique is suitable for the 15-puzzle problem?

- A. Data decomposition
- B. Exploratory decomposition
- C. Speculative decomposition
- D. Recursive decomposition

ANSWER: B

Which of the following method is used to avoid Interaction Overheads?

- A. Maximizing data locality
- B. Minimizing data locality
- C. Increase memory size
- D. None of the above.

ANSWER: A

Which of the following is not parallel algorithm model

- A. The Data Parallel Model
- B. The work pool model
- C. The task graph model
- D. The Speculative Model

ANSWER: D

Nvidia GPU based on following architecture

- A. MIMD
- B. SIMD
- C. SISD
- D. MISD

ANSWER: B

What is Critical Path?

- A. The length of the longest path in a task dependency graph is called the critical path length.
- B. The length of the smallest path in a task dependency graph is called the critical path length.
- C. Path with loop
- D. None of the mentioned.

ANSWER: A

Which decomposition technique uses divide-and-conquer strategy?

- A. recursive decomposition
- B. Sdata decomposition
- C. exploratory decomposition
- D. speculative decomposition

ANSWER: A

If there are 6 nodes in a ring topology how many message passing cycles will be required to complete broadcast process in one to all?

- A. 1
- B. 6
- C. 3
- D. 4

ANSWER: 3

If there is 4 X 4 Mesh topology network then how many ring operation will perform to complete one to all broadcast?

- A. 4
- B. 8
- C. 16
- D. 32

ANSWER: 8

Consider all to all broadcast in ring topology with 8 nodes. How many messages will be present with each node after 3rd step/cycle of communication?

- A. 3
- B. 4
- C. 6
- D. 7

ANSWER: 4

Consider Hypercube topology with 8 nodes then how many message passing cycles will require in all to all broadcast operation?

- A. The longest path between any pair of finish nodes.
- B. The longest directed path between any pair of start & finish node.
- C. The shortest path between any pair of finish nodes.
- D. The number of maximum nodes level in graph.

ANSWER: D

Scatter is \_\_\_\_\_.

- A. One to all broadcast communication
- B. All to all broadcast communication
- C. One to all personalised communication
- D. Node of the above.

ANSWER: C

If there is 4X4 Mesh Topology \_\_\_\_\_ message passing cycles will require complete all to all reduction.

- A. 4
- B. 6
- C. 8
- D. 16

ANSWER: C

Following issue(s) is/are the true about sorting techniques with parallel computing.

- A. Large sequence is the issue
- B. Where to store output sequence is the issue
- C. Small sequence is the issue
- D. None of the above

ANSWER: B

Partitioning on series done after \_\_\_\_\_

- A. Local arrangement
- B. Processes assignments
- C. Global arrangement
- D. None of the above

ANSWER: C

In Parallel DFS processes has following roles. (Select multiple choices if applicable)

- A. Donor
- B. Active
- C. Idle
- D. Passive

ANSWER: A

Suppose there are 16 elements in a series then how many phases will be required to sort the series using parallel odd-even bubble sort?

- A. 8
- B. 4
- C. 5
- D. 15

ANSWER: D

Which are different sources of Overheads in Parallel Programs?

- A. Interprocess interactions
- B. Process Idling
- C. All mentioned options
- D. Excess Computation

ANSWER: C

The ratio of the time taken to solve a problem on a parallel processors to the time required to solve the same problem on a single processor with p identical processing elements.

- A. The ratio of the time taken to solve a problem on a single processor to the time required to solve the same problem on a parallel computer with p identical processing elements.
- B. The ratio of the time taken to solve a problem on a single processor to the time required to solve the same problem on a parallel computer with p identical processing elements
- C. The ratio of number of multiple processors to size of data
- D. None of the above

ANSWER: B

Efficiency is a measure of the fraction of time for which a processing element is usefully employed.

- A. TRUE
- B. FALSE

ANSWER: A

CUDA helps do execute code in parallel mode using \_\_\_\_\_

- A. CPU
- B. GPU
- C. ROM
- D. Cash memory

ANSWER: B

In thread-function execution scenario thread is a \_\_\_\_\_

- A. Work
- B. Worker
- C. Task
- D. None of the above

ANSWER: B

In GPU Following statements are true

- A. Grid contains Block
- B. Block contains Threads
- C. All the mentioned options.
- D. SM stands for Streaming MultiProcessor

ANSWER: C

Computer system of a parallel computer is capable of \_\_\_\_\_

- A. Decentralized computing
- B. Parallel computing
- C. Centralized computing
- D. All of these

ANSWER: A

In which application system Distributed systems can run well?

- A. HPC
- B. Distributed Framework
- C. HRC
- D. None of the above

ANSWER: A

A pipeline is like ..... ?

- A. an automobile assembly line
- B. house pipeline
- C. both a and b
- D. a gas line

ANSWER: A

Pipeline implements ?

- A. fetch instruction
- B. decode instruction
- C. fetch operand
- D. all of above

ANSWER: D

A processor performing fetch or decoding of different instruction during the execution of another instruction is called \_\_\_\_\_ ?

- A. Super-scaling
- B. Pipe-lining
- C. Parallel Computation
- D. None of these

ANSWER: B

In a parallel execution, the performance will always improve as the number of processors will increase?

- A. True

- B. False

ANSWER: B

VLIW stands for ?

- A. Very Long Instruction Word
- B. Very Long Instruction Width
- C. Very Large Instruction Word
- D. Very Long Instruction Width

ANSWER: A

In VLIW the decision for the order of execution of the instructions depends on the program itself?

- A. True

B. False

ANSWER: A

Which one is not a limitation of a distributed memory parallel system?

- A. Higher communication time
- B. Cache coherency
- C. Synchronization overheads
- D. None of the above

ANSWER: B

Which of these steps can create conflict among the processors?

- A. Synchronized computation of local variables
- B. Concurrent write
- C. Concurrent read
- D. None of the above

ANSWER: B

Which one is not a characteristic of NUMA multiprocessors?

- A. It allows shared memory computing
- B. Memory units are placed in physically different location
- C. All memory units are mapped to one common virtual global memory
- D. Processors access their independent local memories

ANSWER: D

Which of these is not a source of overhead in parallel computing?

- A. Non-uniform load distribution
- B. Less local memory requirement in distributed computing
- C. Synchronization among threads in shared memory computing
- D. None of the above

ANSWER: B

Systems that do not have parallel processing capabilities are?

- A. SISD
- B. SIMD
- C. MIMD
- D. All of the above

ANSWER: A

How does the number of transistors per chip increase according to Moore's law?

- A. Quadratically
- B. Linearly
- C. Cubically
- D. Exponentially

ANSWER: D

Parallel processing may occur?

- A. in the instruction stream
- B. in the data stream
- C. both [A] and [B]
- D. none of the above

ANSWER: C

To which class of systems does the von Neumann computer belong?

- A. SIMD (Single Instruction Multiple Data)
- B. MIMD (Multiple Instruction Multiple Data)
- C. MISD (Multiple Instruction Single Data)
- D. SISD (Single Instruction Single Data)

ANSWER: D

Fine-grain threading is considered as a \_\_\_\_\_ threading?

- A. Instruction-level
- B. Loop level
- C. Task-level
- D. Function-level

ANSWER: A

Multiprocessor is systems with multiple CPUs, which are capable of independently executing different tasks in parallel. In this category every processor and memory module has similar access time?

- A. UMA
- B. Microprocessor
- C. Multiprocessor
- D. NUMA

ANSWER: A

For inter processor communication the miss arises are called?

- A. hit rate
- B. coherence misses
- C. comitt misses
- D. parallel processing

ANSWER: B

NUMA architecture uses \_\_\_\_\_ in design?

- A. cache
- B. shared memory
- C. message passing
- D. distributed memory

ANSWER: D

A multiprocessor machine which is capable of executing multiple instructions on multiple data sets?

- A. SISD
- B. SIMD
- C. MIMD
- D. MISD

ANSWER: C

In message passing, send and receive message between?

- A. Task or processes
- B. Task and Execution
- C. Processor and Instruction
- D. Instruction and decode

ANSWER: A

The First step in developing a parallel algorithm is\_\_\_\_\_?

- A. To Decompose the problem into tasks that can be executed

- A. concurrently
- B. Execute directly
- C. Execute indirectly
- D. None of Above

ANSWER: A

The number of tasks into which a problem is decomposed determines its?

- A. Granularity
- B. Priority
- C. Modernity
- D. None of above

ANSWER: A

The length of the longest path in a task dependency graph is called?

- A. the critical path length
- B. the critical data length
- C. the critical bit length
- D. None of above

ANSWER: A

The graph of tasks (nodes) and their interactions/data exchange (edges)?

- A. Is referred to as a task interaction graph
- B. Is referred to as a task Communication graph
- C. Is referred to as a task interface graph
- D. None of Above

ANSWER: A

Mappings are determined by?

- A. task dependency
- B. task interaction graphs
- C. Both A and B
- D. None of Above

ANSWER: C

Decomposition Techniques are?

- A. recursive decomposition
- B. data decomposition
- C. exploratory decomposition
- D. All of Above

ANSWER: D

The Owner Computes Rule generally states that the process assigned a particular data item is responsible for?

- A. All computation associated with it
- B. Only one computation
- C. Only two computation
- D. Only occasionally computation

ANSWER: A

A simple application of exploratory decomposition is\_?

- A. The solution to a 15 puzzle
- B. The solution to 20 puzzle

C. The solution to any puzzle

D. None of Above

ANSWER: A

Speculative Decomposition consist of \_?

A. conservative approaches

B. optimistic approaches

C. Both A and B

D. Only B

ANSWER: C

task characteristics include?

A. Task generation.

B. Task sizes.

C. Size of data associated with tasks.

D. All of Above

ANSWER: D

Writing parallel programs is referred to as?

A. Parallel computation

B. Parallel processes

C. Parallel development

D. Parallel programming

ANSWER: D

Parallel Algorithm Models?

A. Data parallel model

B. Bit model

C. Data model

D. network model

ANSWER: A

The number and size of tasks into which a problem is decomposed determines the?

A. fine-granularity

B. coarse-granularity

C. sub Task

D. granularity

ANSWER: A

A feature of a task-dependency graph that determines the average degree of concurrency for a given granularity is its \_\_\_\_\_ path?

A. critical

B. easy

C. difficult

D. ambiguous

ANSWER: A

The pattern of \_\_\_\_\_ among tasks is captured by what is known as a task-interaction graph?

A. Interaction

B. communication

C. optimization

D. flow  
ANSWER: A

Interaction overheads can be minimized by \_\_\_\_?

- A. Maximize Data Locality
- B. Maximize Volume of data exchange
- C. Increase Bandwidth
- D. Minimize social media contents

ANSWER: A

Type of parallelism that is naturally expressed by independent tasks in a task-dependency graph is called \_\_\_\_\_ parallelism?

- A. Task
- B. Instruction
- C. Data
- D. Program

ANSWER: A

Speed up is defined as a ratio of?

- A.  $s = T_s / T_p$
- B.  $S = T_p / T_s$
- C.  $T_s = S / T_p$
- D.  $T_p = S / T_s$

ANSWER: A

Parallel computing means to divide the job into several \_\_\_\_\_?

- A. Bit
- B. Data
- C. Instruction
- D. Task

ANSWER: D

\_\_\_\_\_ is a method for inducing concurrency in problems that can be solved using the divide-and-conquer strategy?

- A. exploratory decomposition
- B. speculative decomposition
- C. data-decomposition
- D. Recursive decomposition

ANSWER: C

The \_\_\_\_\_ time collectively spent by all the processing elements  $T_{all} = p \cdot T_p$ ?

- A. total
- B. Average
- C. mean
- D. sum

ANSWER: A

Group communication operations are built using point-to-point messaging primitives?

- A. True
- B. False

ANSWER: A

Communicating a message of size  $m$  over an uncongested network takes time  $ts + tmw$ ?

- A. True
- B. False

ANSWER: A

The dual of one-to-all broadcast is ?

- A. All-to-one reduction
- B. All-to-one receiver
- C. All-to-one Sum
- D. None of Above

ANSWER: A

A hypercube has?

- A.  $2^d$  nodes
- B.  $2^d$  nodes
- C.  $2n$  Nodes
- D.  $N$  Nodes

ANSWER: A

A binary tree in which processors are (logically) at the leaves and internal nodes are routing nodes?

- A. True
- B. False

ANSWER: A

In All-to-All Broadcast each processor is the source as well as destination?

- A. True
- B. False

ANSWER: A

The Prefix Sum Operation can be implemented using the ?

- A. All-to-all broadcast kernel.
- B. All-to-one broadcast kernel.
- C. One-to-all broadcast Kernel
- D. Scatter Kernel

ANSWER: A

In the scatter operation ?

- A. Single node send a unique message of size  $m$  to every other node
- B. Single node send a same message of size  $m$  to every other node
- C. Single node send a unique message of size  $m$  to next node
- D. None of Above

ANSWER: A

The gather operation is exactly the inverse of the ?

- A. Scatter operation
- B. Broadcast operation
- C. Prefix Sum
- D. Reduction operation

ANSWER: A

In All-to-All Personalized Communication Each node has a distinct

message of size  $m$  for every other node ?

- A. True
  - B. False
- ANSWER: A

Parallel algorithms often require a single process to send identical data to all other processes or to a subset of them. This operation is known as \_\_\_\_\_?

- A. one-to-all broadcast
- B. All to one broadcast
- C. one-to-all reduction
- D. all to one reduction

ANSWER: A

In which of the following operation, a single node sends a unique message of size  $m$  to every other node?

- A. Gather
- B. Scatter
- C. One to all personalized communication
- D. Both A and C

ANSWER: D

Gather operation is also known as \_\_\_\_\_?

- A. One to all personalized communication
- B. One to all broadcast
- C. All to one reduction
- D. All to All broadcast

ANSWER: A

one-to-all personalized communication does not involve any duplication of data?

- A. True
  - B. False
- ANSWER: A

Gather operation, or concatenation, in which a single node collects a unique message from each node?

- A. True
  - B. False
- ANSWER: A

Conventional architectures coarsely comprise of a?

- A. A processor
- B. Memory system
- C. Data path.
- D. All of Above

ANSWER: D

Data intensive applications utilize?

- A. High aggregate throughput
- B. High aggregate network bandwidth
- C. High processing and memory system performance.
- D. None of above

ANSWER: A

A pipeline is like?

- A. Overlaps various stages of instruction execution to achieve performance.
- B. House pipeline
- C. Both a and b
- D. A gas line

ANSWER: A

Scheduling of instructions is determined?

- A. True Data Dependency
- B. Resource Dependency
- C. Branch Dependency
- D. All of above

ANSWER: D

VLIW processors rely on?

- A. Compile time analysis
- B. Initial time analysis
- C. Final time analysis
- D. Mid time analysis

ANSWER: A

Memory system performance is largely captured by?

- A. Latency
- B. Bandwidth
- C. Both a and b
- D. none of above

ANSWER: C

The fraction of data references satisfied by the cache is called?

- A. Cache hit ratio
- B. Cache fit ratio
- C. Cache best ratio
- D. none of above

ANSWER: A

A single control unit that dispatches the same Instruction to various processors is?

- A. SIMD
- B. SPMD
- C. MIMD
- D. None of above

ANSWER: A

The primary forms of data exchange between parallel tasks are?

- A. Accessing a shared data space
- B. Exchanging messages.
- C. Both A and B
- D. None of Above

ANSWER: C

Switches map a fixed number of inputs to outputs?

- A. True

B. False

ANSWER: A

The First step in developing a parallel algorithm is?

A. To Decompose the problem into tasks that can be executed concurrently

B. Execute directly

C. Execute indirectly

D. None of Above

ANSWER: A

The number of tasks into which a problem is decomposed determines its?

A. Granularity

B. Priority

C. Modernity

D. None of above

ANSWER: A

The length of the longest path in a task dependency graph is called?

A. the critical path length

B. the critical data length

C. the critical bit length

D. None of above

ANSWER: A

The graph of tasks (nodes) and their interactions/data exchange (edges)?

A. Is referred to as a task interaction graph

B. Is referred to as a task Communication graph

C. Is referred to as a task interface graph

D. None of Above

ANSWER: A

Mappings are determined by?

A. task dependency

B. task interaction graphs

C. Both A and B

D. None of Above

ANSWER: C

Decomposition Techniques are?

A. recursive decomposition

B. data decomposition

C. exploratory decomposition

D. All of Above

ANSWER: D

The Owner Computes Rule generally states that the process assigned a particular data item are responsible for?

A. All computation associated with it

B. Only one computation

C. Only two computation

D. Only occasionally computation

ANSWER: A

- A simple application of exploratory decomposition is?
- A. The solution to a 15 puzzle
  - B. The solution to 20 puzzle
  - C. The solution to any puzzle
  - D. None of Above

ANSWER: A

Speculative Decomposition consist of ?

- A. conservative approaches
- B. optimistic approaches
- C. Both A and B
- D. Only B

ANSWER: C

Task characteristics include?

- A. Task generation.
- B. Task sizes.
- C. Size of data associated with tasks.
- D. All of Above.

ANSWER: D

Group communication operations are built using point-to-point messaging primitives?

- A. True
- B. False

ANSWER: A

Communicating a message of size  $m$  over an uncongested network takes time  $ts + tmw$ ?

- A. True
- B. False

ANSWER: A

The dual of one-to-all broadcast is?

- A. All-to-one reduction
- B. All-to-one receiver
- C. All-to-one Sum
- D. None of Above

ANSWER: A

A hypercube has?

- A.  $2^d$  nodes
- B.  $3^d$  nodes
- C.  $2^n$  Nodes
- D.  $N$  Nodes

ANSWER: A

A binary tree in which processors are (logically) at the leaves and internal nodes are routing nodes?

- A. True
- B. False

ANSWER: A

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- B. False

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- A. True
- B. False

ANSWER: A

Computer system of a parallel computer is capable of?

- A. Decentralized computing
- B. Parallel computing
- C. Centralized computing
- D. Decentralized computing
- E. Distributed computing

ANSWER: A

Writing parallel programs is referred to as?

- A. Parallel computation
- B. Parallel processes
- C. Parallel development
- D. Parallel programming

ANSWER: D

Simplifies applications of three-tier architecture is \_\_\_\_\_?

- A. Maintenance
- B. Initiation
- C. Implementation
- D. Deployment

ANSWER: D

Dynamic networks of networks, is a dynamic connection that grows is called?

- A. Multithreading
- B. Cyber cycle
- C. Internet of things
- D. Cyber-physical system

ANSWER: C

In which application system Distributed systems can run well?

- A. HPC
- B. HTC
- C. HRC
- D. Both A and B

ANSWER: D

In which systems desire HPC and HTC?

- A. Adaptivity
- B. Transparency
- C. Dependency
- D. Secretive

ANSWER: B

No special machines manage the network of architecture in which resources are known as?

- A. Peer-to-Peer
- B. Space based
- C. Tightly coupled
- D. Loosely coupled

ANSWER: A

Significant characteristics of Distributed systems have of ?

- A. 5 types
- B. 2 types
- C. 3 types
- D. 4 types

ANSWER: C

Built of Peer machines are over?

- A. Many Server machines
- B. 1 Server machine
- C. 1 Client machine
- D. Many Client machines

ANSWER: D

Type HTC applications are?

- A. Business
- B. Engineering
- C. Science
- D. Media mass

ANSWER: A

Virtualization that creates one single address space architecture

that of, is called?  
A. Loosely coupled  
B. Peer-to-Peer  
C. Space-based  
D. Tightly coupled

ANSWER: C

We have an internet cloud of resources In cloud computing to form?

- A. Centralized computing
- B. Decentralized computing
- C. Parallel computing
- D. All of these

ANSWER: D

Data access and storage are elements of Job throughput, of  
\_\_\_\_\_?

- A. Flexibility
- B. Adaptation
- C. Efficiency
- D. Dependability

ANSWER: C

Billions of job requests is over massive data sets, ability to support known as?

- A. Efficiency
- B. Dependability
- C. Adaptation
- D. Flexibility

ANSWER: C

Broader concept offers Cloud computing .to select which of the following?

- A. Parallel computing
- B. Centralized computing
- C. Utility computing
- D. Decentralized computing

ANSWER: C

Resources and clients transparency that allows movement within a system is called?

- A. Mobility transparency
- B. Concurrency transparency
- C. Performance transparency
- D. Replication transparency

ANSWER: A

Distributed program in a distributed computer running a is known as?

- A. Distributed process
- B. Distributed program
- C. Distributed application
- D. Distributed computing

ANSWER: B

Uniprocessor computing devices is called\_\_\_\_\_?

- A. Grid computing
- B. Centralized computing
- C. Parallel computing
- D. Distributed computing

ANSWER: B

Utility computing focuses on a\_\_\_\_\_ model?

- A. Data
- B. Cloud
- C. Scalable
- D. Business

ANSWER: D

What is a CPS merges technologies?

- A. 5C
- B. 2C
- C. 3C
- D. 4C

ANSWER: C

Aberration of HPC?

- A. High-peak computing
- B. High-peripheral computing
- C. High-performance computing
- D. Highly-parallel computing

ANSWER: C

Peer-to-Peer leads to the development of technologies like?

- A. Norming grids
- B. Data grids
- C. Computational grids
- D. Both A and B

ANSWER: D

Type of HPC applications of?

- A. Management
- B. Media mass
- C. Business
- D. Science

ANSWER: D

The development generations of Computer technology has gone through?

- A. 6
- B. 3
- C. 4
- D. 5

ANSWER: D

Utilization rate of resources in an execution model is known to be its?

- A. Adaptation
- B. Efficiency
- C. Dependability
- D. Flexibility

ANSWER: B

Even under failure conditions Providing Quality of Service (QoS) assurance is the responsibility of?

- A. Dependability
- B. Adaptation
- C. Flexibility
- D. Efficiency

ANSWER: A

Interprocessor communication that takes place?

- A. Centralized memory
- B. Shared memory
- C. Message passing
- D. Both A and B

ANSWER: D

Data centers and centralized computing covers many and?

- A. Microcomputers
- B. Minicomputers
- C. Mainframe computers
- D. Supercomputers

ANSWER: D

Which of the following is an primary goal of HTC paradigm\_\_\_\_\_?

- A. High ratio Identification
- B. Low-flux computing
- C. High-flux computing
- D. Computer utilities

ANSWER: C

The high-throughput service provided is measures taken by

- A. Flexibility
- B. Efficiency
- C. Dependability
- D. Adaptation

ANSWER: D

What are the sources of overhead?

- A. Essential /Excess Computation
- B. Inter-process Communication
- C. Idling
- D. All above

ANSWER: D

Which are the performance metrics for parallel systems?

- A. Execution Time
- B. Total Parallel Overhead
- C. Speedup
- D. All above

ANSWER: D

The efficiency of a parallel program can be written as:  $E = Ts /$

pTp. True or False?

- A. True
  - B. False
- ANSWER: A

The important feature of the VLIW is \_\_\_\_\_?

- A. ILP
- B. Performance
- C. Cost effectiveness
- D. delay

ANSWER: A

**1.Following is true about one to all broadcast**

A.In one to all broadcast initially there will be P(Number of processors) copies of messages and after broadcast finally there will be single copy

B.In one to all broadcast initially there will be single copy of message and after broadcast finally there will be P(Number of processors) copies.

[Submit](#)

**Answer**

"In one to all broadcast initially there will be single copy of message and after broadcast finally there will be P(Number of processors) copies."

**2.If total 8 nodes are in ring topology after one to all message broadcasting how many source nodes will be present?**

2

4

8

1

[Submit](#)

**Answer**

8

**3.Current source node selects \_\_\_\_\_ node as next source node in linear/ring one to all message broadcast**

A.nearest node

B.longest node

**Submit**

**Answer**

longest node

**4.In All-to-one reduction after reduction the final copy of message is available on which node?**

A.Source Node

B.Destination Node

C.Both of the above

D.None of these

**Answer**

Destination Node

**5.If there is 4 by 4 mesh topology network present(as per shown in the video) then in how many broadcast cycles will be required to reach message to all 16 nodes?**

2

8

4

16

**Submit**

**Answer**

4

**6.If there are 8 nodes in a ring topology how many message passing cycles will be required to complete reduction process**

1

2

3

4

**Submit**

**Answer**

3

**7.In One to all broadcast using Hypercube topology how source node selects next destination node?**

Node which is having lowest binary code (label)

Node which is having hightest binary code (label)

To all connected node at a time

None of the above

**Submit**

**Answer**

Node which is having highest binary code (label)

**8.If there are 8 nodes connected in ring topology then \_\_\_ number of message passing**

**cycles will be required to complete all to all broadcast in parallel mode.**

3

4

8

7

**Submit**

**Answer**

7

**9.Consider all to all broadcast in ring topology with 8 nodes.How many messages will be**

**present with each node after 3rd step/cycle of communication?**

3

4

7

None of the above

**Submit**

**Answer**

4

**10.If there are 16 messages in 4x4 mesh then total how many message passing cycles**

**will be required to complete all to all broadcast operation?**

4

5

6

8

**Submit**

**Answer**

6

**11.If there are P messages in mxm mesh then total how many message passing cycles**

**will be required to complete all to all broadcast operation?**

$2 \sqrt{P} - 2$

$2 \sqrt{P} - 1$

$2 \sqrt{P}$

None of the above

**Submit**

**Answer**

$2 \sqrt{P} - 2$

**12.**How many message passing cycles required for all-to-all broadcasting in 8 nodes hypercube?

4

3

2

8

**Submit**

**Answer**

3

**13.**In scatter operation after message broadcasting every node avail with same message copy.

True

False

**Submit**

**Answer**

False

**14.CUDA helps do execute code in parallel mode using \_\_**

CPU

GPU

ROM

Cash memory

**Submit**

**Answer**

GPU

**15.In thread-function execution scenario thread is a \_\_**

Work

Worker

Task

None of the above

**Submit**

**Answer**

Worker

**16.In GPU Following statements are true**

Block contains Grid

Grid contains Block

Block contains Threads

SM stands for Streaming MultiMedia

SM stands for Streaming MultiProcessor

**Submit**

**Answer**

“Grid contains Block”, “Block contains Threads”, “SM stands for Streaming MultiProcessor”

**17.Following issue(s) is/are the true about sorting techniques with parallel computing.**

Large sequence is the issue

Where to store output sequence is the issue

Where to store input sequence is the issue

None of the above

**Submit**

**Answer**

“Where to store output sequence is the issue”, “Where to store input sequence is the issue”

**18. Partitioning on series done after \_\_**

Local arrangement

Processess assignments

Global arrangement

None of the above

**Submit**

**Answer**

Global arrangement

**19. In Parallel DFS processes has following roles.(Select multiple choices if applicable)**

Donor

Active

Idle

Recipient

**Submit**

**Answer**

“Donor”, “Recipient”

**20. Suppose there are 16 elements in a series then how many phases will be required to sort the series using parallel odd-even bubble sort?**

8

4

5

15

**Submit**

**Answer**

15

**21. Which are different sources of Overheads in Parallel Programs?**

Interprocess interactions

Process Idling

Large amount of DATA

Excess Computation

**Submit**

**Answer**

“Interprocess interactions”, “Process Idling”, “Excess Computation”

1 / 1 points

1 / 1 attempts

**22.SPEEDUP (S) IS....**

The ratio of the time taken to solve a problem on a parallel processors to the time required to solve the same problem on a single processor with p identical processing elements

The ratio of the time taken to solve a problem on a single processor to the time required to solve the same problem on a parallel computer with p identical processing elements

The ratio of number of multiple processors to size of data

None of the above

**Submit**

**Answer**

The ratio of the time taken to solve a problem on a single processor to the time required to solve the same problem on a parallel computer with p identical processing elements

1 / 1 points

1 / 1 attempts

**23.EFFICIENCY IS A MEASURE OF THE FRACTION OF TIME FOR WHICH A PROCESSING ELEMENT IS USEFULLY EMPLOYED.**

TRUE

FALSE

**Submit**

**Answer**

TRUE

## SUB : 410241 HPC

### 1. What is Cuda Architecture?

- a.CUDA Architecture included a unified shader pipeline, allowing each and every chip to be marshaled by a program.
- b.CUDA Architecture included a unified shader pipeline, allowing each and every unit on the chip to be marshaled by a program intending to perform general-purpose computations
- c.CUDA Architecture included a unified shader pipeline, allowing each and every logic unit on the chip to be marshaled by a program intending to perform general-purpose computations
- d.CUDA Architecture included a unified shader pipeline, allowing each and every arithmetic logic unit (ALU) on the chip to be marshaled by a program intending to perform general-purpose computations

Ans.D

### 2. For the following code write a kernel

```
__global__ void kernel( void ) { }
int main( void ) {
// Write a kernel here
```

```
printf( "Hello, World!\n" ); return 0; }
```

- a.kernel<1, 1>(1,1);
- b.kernel<<<1, 1>>>(1,1);
- c.kernel<<<1, 1>>>();
- d.kernel<<1, 1>>();

Ans. c

### 3. Find out which is the kernel from following code:

```
#include <iostream>
__global__ void add( int a, int b, int *c ) {
*c = a + b;
}

int main( void ) {
int c; int *dev_c;

HANDLE_ERROR( cudaMalloc( (void**)&dev_c, sizeof(int) ) );
```

## SUB : 410241 HPC

```
add<<<1,1>>>( 2, 7, dev_c );

HANDLE_ERROR( cudaMemcpy( &c, dev_c, sizeof(int), cudaMemcpyDeviceToHost ) );
printf( "2 + 7 = %d\n", c );
cudaFree( dev_c );
return 0;

}

a.cudaMalloc( (void**)&dev_c, sizeof(int) )
b.add<<<1,1>>>(2, 7, dev_c)
c.add<<1,1>>( 2, 7, dev_c );
d.add<<<1,1>>>()
```

Ans.b

4. From following code which particular line is responsible for copying between device to host

```
#include <iostream>
__global__ void add( int a, int b, int *c ) {
    *c = a + b;
}

int main( void ) {
    int c; int *dev_c;

    HANDLE_ERROR( cudaMalloc( (void**)&dev_c, sizeof(int) ) );

    add<<<1,1>>>( 2, 7, dev_c );

    HANDLE_ERROR( cudaMemcpy( &c, dev_c, sizeof(int), cudaMemcpyDeviceToHost ) );
    printf( "2 + 7 = %d\n", c );
    cudaFree( dev_c );
    return 0;

}

a. c, dev_c, sizeof(int);
b. HANDLE_ERROR( &c, dev_c, sizeof(int), cudaMemcpyDeviceToHost );
```

## SUB : 410241 HPC

- c. HANDLE\_ERROR( cudaMemcpy( &c, dev\_c, sizeof(int), cudaMemcpyDeviceToHost ) );
- d. cudaMemcpy( &c, dev\_c, sizeof(int), cudaMemcpyDeviceToHost ) ;

Ans.c

5. What is output of the following code:

```
#include <iostream>
__global__ void add( int a, int b, int *c ) {
    *c = a + b;
}

int main( void ) {
    int c; int *dev_c;

    HANDLE_ERROR( cudaMalloc( (void**)&dev_c, sizeof(int) ) );

    add<<<1,1>>>( 2, 7, dev_c );

    HANDLE_ERROR( cudaMemcpy( &c, dev_c, sizeof(int), cudaMemcpyDeviceToHost ) );
    printf( "2 + 7 = %d\n", c );
    cudaFree( dev_c );
    return 0;
}
```

- a.2
- b.9
- c.7
- d.0

Ans. b

- 6.what is function of e \_\_global\_\_ qualifier in cuda program

- a. alerts the compiler that a function should be compiled to run on a device instead of the host
- b. alerts the interpreter that a function should be compiled to run on a device instead of the host

## **SUB : 410241 HPC**

- c. alerts the interpreter that a function should be interpreted to run on a device instead of the host
- d. alerts the interpreter that a function should be compiled to run on a host instead of the device

ans.a

7.The on-chip memory which is local to every multithreaded Single Instruction Multiple Data (SIMD) Processor is called

- a.Local Memory
- b.Global Memory
- c.Flash memory
- d.Stack

Ans. a

8. The machine object created by the hardware, managing, scheduling, and executing is a thread of

- a.DIMS instructions
- b.DMM instructions
- c.SIMD instructions
- d.SIM instructions

Ans. c

9. The primary and essential mechanism to support the sparse matrices is

- a.Gather-scatter operations
- b.Gather operations
- c.Scatter operations
- d.Gather-scatter technique

Ans. a

10. Which of the following architectures is/are not suitable for realizing SIMD ?

## SUB : 410241 HPC

- a.Vector Processor
  - b.Array Processor
  - c.Von Neumann
  - d.All of the above
- Ans . c

11. Multithreading allowing multiple-threads for sharing the functional units of a

- a.Multiple processor
- b.Single processor
- c.Dual core
- d. Corei5

Ans . b

12. Which compiler is used to compile the cuide source code:

- a.gcc
- b.nvc++
- c.nc++
- d.nvcc

Ans.d

13. which command line is used to execute a cuda program :

- a.nvcc hello.cu -o hello
- b.ng++ heloo.cpp -o hello
- c.ncc hello.c -o hello
- D.g++ hello.cu -o hello

Ans.a

14.The syntax of kernel execution configuration is as follows

- a.<<< **M** , **T** >>> with a grid of **M** thread blocks. Each thread block has **T** parallel blocks
- b.<<< **M** , **T** >>> with a grid of **M** blocks. Each thread block has **T** parallel threads
- c.<<< **M** , **T** >>> with a grid of **M** thread blocks. Each thread block has **T** parallel threads
- d.<<< **M** , **T** >>> with a grid of **M** thread blocks. Each thread block has **T** threads

Ans. c

## SUB : 410241 HPC

15.what it contains threadIdx.x

- A.contains the index of the thread within the block
- b.contains the index of the block within the thread
- c.contains the index of the thread size within the block
- d.contains the index of the block size within the thread

Ans. A

16.what it contains blockDim.x

- a.contains the size of block
- b.contains the size of block thread
- c.contains the size of thread block (number of threads in the thread block).
- d.the size of thread block

Ans. c

17.memory allocation of of variable x and y in cuda:

```
A.float *b, *a;  
cudaMallocManaged(&b, N*sizeof(float));  
cudaMallocManaged(&a, N*sizeof(float));  
  
B.float *x, *y;  
cudaMallocManaged(&x, N*sizeof(float));  
cudaMallocManaged(&y, N*sizeof(float));  
  
C.float *a, *b;  
cudaMallocManaged(&a, N*sizeof(float));  
cudaMallocManaged(&b, N*sizeof(float));  
  
D.float *x, *y;  
cudaMallocManaged(&x, N*sizeof(float));  
cudaMallocManaged(&y, N*sizeof(float));
```

Ans. d

18.which function is used for free the memory in cuda

- a.cudaFree()

## SUB : 410241 HPC

- b.Free()
- c.Cudafree()
- d.CudaFree()

Ans. a

19. Which of the following is *not* a form of parallelism supported by CUDA

- a.Vector parallelism - Floating point computations are executed in parallel on wide vector units
- b.Thread level task parallelism - Different threads execute a different tasks
- c.Block and grid level parallelism - Different blocks or grids execute different tasks
- d.Data parallelism - Different threads and blocks process different parts of data in memory

Ans . a

20.The style of parallelism supported on GPUs is best described as

- a.SISD - Single Instruction Single Data
- b.MISD - Multiple Instruction Single Data
- c.SIMT - Single Instruction Multiple Thread
- d.MIMD - Multiple Instruction Multiple Data

Ans. c

21. Which of the following correctly describes a GPU kernel

- a.A kernel may contain a mix of host and GPU code
- b.All thread blocks involved in the same computation use the same kernel
- c.A kernel is part of the GPU's internal micro-operating system, allowing it to act as an independent host
- d.All thread blocks involved in the same computation use a different kernel

Ans .b

22.Shared memory in CUDA is accessible to:

- a.All threads in a single block
- b.Both the host and GPU
- c.All threads associated with a single kernel
- d.one thread in a single block

## **SUB : 410241 HPC**

Ans.a

23.Which of the following correctly describes the relationship between Warps, thread blocks, and CUDA cores?

- a.A warp is divided into a number of thread blocks, and each thread block executes on a single CUDA core
- b.A thread block may be divided into a number of warps, and each warp may execute on a single CUDA core
- c.A thread block is assigned to a warp, and each thread in the warp is executed on a separate CUDA core
- d. A block index is same as thread index

Ans .b

24. A processor assigned with a thread block, that executes a code ,which we usually call a

- A. multithreaded MIMD processor
- b. multithreaded SIMD processor
- c. multithreaded
- D. multicore

Ans. c

25. Thread blocked altogether and being executed in the sets of 32 thread called as

- a.block of thread
- b.thread block
- c.thread
- d.block

Ans. b

26.Who developed CUDA :

- a. ARM
- b. INTEL
- c. AMD
- d. NVIDIA

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Ans. d