

# High Performance Computing (HPC) MCQs [set-13]

**301. In All-to-All Personalized Communication on a Ring, the size of the message reduces by \_\_\_\_\_ at each step**

- A.  $p$
- B.  $m-1$
- C.  $p-1$
- D.  $m$

Answer: A

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**302. All-to-All Broadcast and Reduction algorithm on a Ring terminates in \_\_\_\_\_ steps.**

- A.  $p+1$
- B.  $p-1$
- C.  $p*p$
- D.  $p$

Answer: C

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**303. In All-to-all Broadcast on a Mesh, operation performs in which sequence?**

- A. rowwise, columnwise
- B. columnwise, rowwise
- C. columnwise, columnwise
- D. rowwise, rowwise

Answer: B

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**304. Messages get smaller in and stay constant in .**

- A. gather, broadcast
- B. scatter , broadcast
- C. scatter, gather
- D. broadcast, gather

Answer: C

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**305. The time taken by all-to- all broadcast on a ring is .**

- A.  $t = (t_s + t_{wm})(p-1)$
- B.  $t = t_s \log p + t_{wm}(p-1)$
- C.  $t = 2t_s(p-1) - t_{wm}(p-1)$
- D.  $t = 2t_s(p-1) + t_{wm}(p-1)$

Answer: B

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**306. The time taken by all-to- all broadcast on a mesh is .**

- A.  $t = (t_s + t_{wm})(p-1)$
- B.  $t = t_s \log p + t_{wm}(p-1)$
- C.  $t = 2t_s(p-1) - t_{wm}(p-1)$
- D.  $t = 2t_s(p-1) + t_{wm}(p-1)$

Answer: A

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**307. The time taken by all-to- all broadcast on a hypercube is .**

- A.  $t = (t_s + t_{wm})(p-1)$
- B.  $t = t_s \log p + t_{wm}(p-1)$
- C.  $t = 2t_s(p-1) - t_{wm}(p-1)$
- D.  $t = 2t_s(p-1) + t_{wm}(p-1)$

Answer: C

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**308. The prefix-sum operation can be implemented using the kernel**

- A. all-to-all broadcast
- B. one-to-all broadcast
- C. all-to-one broadcast
- D. all-to-all reduction

Answer: B

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**309. Select the parameters on which the parallel runtime of a program depends.**

- A. number of processors
- B. communication parameters of the machine
- C. all of the above
- D. input size

Answer: D

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**310. The time that elapses from the moment the first processor starts to the moment the last processor finishes execution is called as .**

- A. parallel runtime

- B. overhead runtime
- C. excess runtime
- D. serial runtime

Answer: B

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**311. Select how the overhead function ( $T_o$ ) is calculated.**

- A.  $t_o = p \cdot n \cdot t_p - t_s$
- B.  $t_o = p \cdot t_p - t_s$
- C.  $t_o = t_p - p \cdot t_s$
- D.  $t_o = t_p - t_s$

Answer: C

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**312. 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. overall time
- B. speedup
- C. scaleup
- D. efficiency

Answer: C

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**313. Which is alternative options for latency hiding?**

- A. increase cpu frequency
- B. multithreading
- C. increase bandwidth
- D. increase memory

Answer: B

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**314. \_\_\_\_\_ Communication model is generally seen in tightly coupled system.**

- A. message passing
- B. shared-address space
- C. client-server
- D. distributed network

Answer: B

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**315. 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

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**316. 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

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**317. 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

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**318. 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

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**319. 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

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**320. 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

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**321. Nvidia GPU based on following architecture**

- A. mimd
- B. simd
- C. sisd
- D. misd

Answer: B

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**322. 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

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**323. Which decomposition technique uses divide-and-conquer strategy?**

- A. recursive decomposition
- B. sdata decomposition
- C. exploratory decomposition
- D. speculative decomposition

Answer: A

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**324. 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

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**325. Scatter is \_\_\_\_\_.**

- A. one to all broadcast communication
- B. all to all broadcast communication

C. one to all personalised communication

D. none of the above.

Answer: C

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