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**CS 1318E043** BINA CHOWDHURY CENTRAL LIBRARY  
(GIMT & GIPS)

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Guwahati - 781017

Roll No. of candidate

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**2019**

**B.Tech. 8th Semester End-Term Examination**

**DISTRIBUTED SYSTEM**

**Elective IV (Departmental)**

Full Marks – 100

Time – Three hours

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The figures in the margin indicate full marks  
for the questions.

Answer Question No. 1 and any *six* from the rest.

1. Answer the following questions :

(10 × 1 = 10)

- (a) What do you mean by Distributed System?
- (b) What are the advantages of Distributed system?
- (c) What do you mean by clock drift?
- (d) What is Clock Skew?
- (e) What do you mean by asynchronous distributed system?
- (f) What do you mean by mobile code in client server architecture?
- (g) What do you mean by transparency?
- (h) What is marshalling in RPC?
- (i) What is distributed deadlock?
- (j) Define replication and fault tolerance.

[Turn over

2. Answer the following questions :

- (a) Discuss the role of middleware in Distributed System. (5)
- (b) What do you mean by thin client and Fat Client? Discuss with diagrams. (5)
- (c) Briefly discuss about Openness and Scalability in Distributed System. (5)

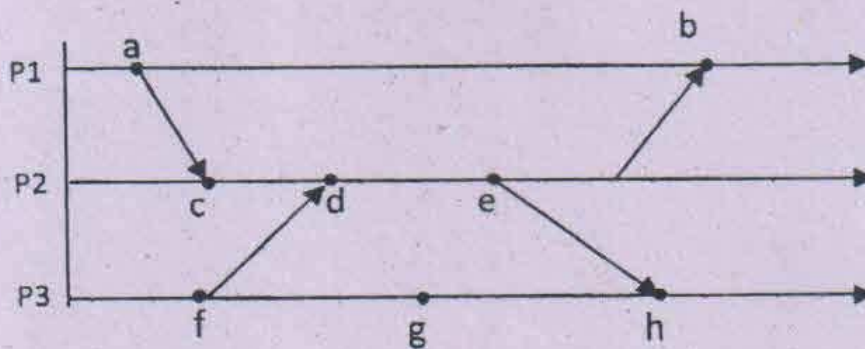
3. Answer the following questions :

- (a) A client attempt to synchronize with a time server. It records the roundtrip times and timestamps returned by the server in the table below. (5)

| Round Trip (ms) | Time (hr:min:sec) |
|-----------------|-------------------|
| 30              | 10:54:23.674      |
| 35              | 10:54:25.450      |
| 20              | 10:54:28.342      |

Which of these times should it use to set its clock? To what time should it set it? [Hint: use Cristian's Algorithm]

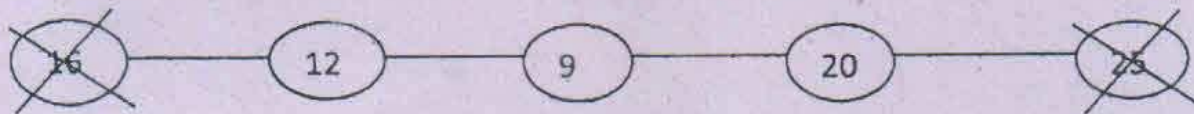
- (b) Discuss happened before relation. What is Lamport's are the limitations of Lamport's clock? Find timestamps for the events shown below. (3 + 3 + 2 + 2)



4. Answer the following questions
- (a) An NTP server B receives server A's message at 16:34:23.480 bearing a timestamp 16:34:13.430 and replies to it. A receives the message at 16:34:15.725, bearing B's timestamp 16:34:25.7. Estimate the offset between B and A. (5)
- (b) Discuss the ring-based algorithm for mutual exclusion. Give an example to show that in ring-based algorithm processes are not necessarily granted entry to the critical section in happened-before order. (5 + 5)

5. Answer the following questions :

- (a) Discuss Ricart and Agrawala's Algorithm. (8)
- (b) Consider the following diagram where processes with their identifiers are given. Here the process with highest identifier is the coordinator. Consider, the process with id = 16 and the coordinator crashes at the same time. If the process with id = 9 is the first process to notice about the crash of the coordinator then discuss how the new coordinator will be elected. [Apply Bully Algorithm].



6. Answer the following questions :
- (a) What is CORBA? How interoperability can be achieved using CORBA (8)
- (b) What are stub and skeleton and why are they needed in remote procedure call? (7)

7. Answer the following questions :

(a) Explain the design issues of a Distributed File System. (7)

(b) Explain Distributed 2-phase commit protocol. (8)

8. Answer the following questions :

(a) What is a distributed deadlock and why are they hard to detect? Explain. (10)

(b) What is concurrency and why is concurrency control required? (5)

9. Write Short notes on — (*any two*) (2 × 7½ = 15)

(a) Active replication model

(b) Digital Signature

(c) Architectural model of Distributed system.

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