

[6584]-163

B.E. (Information Technology)

DISTRIBUTED SYSTEMS

(2019 Pattern) (Semester - VIII) (414450)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.
- 2) Figures to the right indicate full marks.
- 3) Neat diagrams must be drawn wherever necessary.
- 4) Assume suitable data, if necessary.

- Q1) a)** What are the general characteristics of interprocess communication? What are various types of Synchronous and asynchronous communication in IPC? Why is blocking receive has no disadvantages in Java. [8]
- b)** Explain the concept of “happened before” relationship in the context of Lamport’s logical clock algorithm? How does an algorithm assign timestamps to events in a distributed system? [9]

OR

- Q2) a)** Define External Data Representation, Marshalling and Unmarshalling. Discuss the three alternative approaches to XDR and marshalling. [8]
- b)** Consider the Figure 1 that shows four processes (P1, P2, P3, P4) with events a, b, c,... and messages communicating between them. Assume that initial logical clock values are all initialized to 0. List the Lamport timestamps for each event shown in Figure 1. Assume that each process maintains a logical clock as a single integer value as a Lamport clock. Provide timestamps for each labeled event. [9]

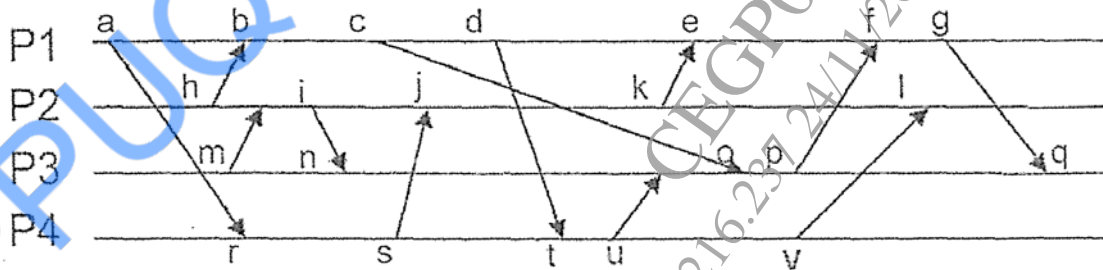


Figure 1: A space-time diagram

P.T.O.

- Q3)** a) Discuss the two important reasons for wanting to replicate data and how does replication relate to scalability? [9]
b) What is client-centric consistency model? Explain monotonic read consistency with suitable example. [9]

OR

- Q4)** a) What is the distribution commit problem? Discuss how this problem is solved using the two-phase commit protocol with suitable diagram. [9]
b) What is the key issue in distributed system that supports replication? Differentiate replica server and content placement. Discuss in brief, various ways to compute best placement of replica servers. [9]

- Q5)** a) Why Quality of Service Management is important in Distributed Multimedia Systems? Describe QoS manager responsibilities using suitable graphical representation. [8]
b) Describe the Sun Network File System architecture in details. [9]

OR

- Q6)** a) Describe the design of a peer-to-peer file sharing application designed to support very large multimedia files. How does the BitTorrent protocol operate? [9]
b) Describe, using the appropriate diagram, how a web service is implemented in horizontal distribution using web server clusters. [8]

- Q7)** a) Explain the following in brief: [9]
i) Wearable devices
ii) PVM
iii) JINI
b) What is Service Oriented Architecture (SOA)? Explain the various SOA components. How does it differ from traditional software architecture? [9]

OR

- Q8)** a) Explain in brief, the key features of Prometheus including data model, query language, or alerting rules. [9]
b) Explain in brief following Microkernels [9]
i) CHORUS
ii) Mach

