

Total No. of Questions : 8]

SEAT No. :

PD4668

[Total No. of Pages : 2

[6404]-174

B.E. (Information Technology)
DISTRIBUTED SYSTEMS
(2019 Pattern) (Semester - VIII) (414450)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Figures to the right indicate full marks.
- 3) Neat diagrams must be drawn wherever necessary.
- 4) Assume suitable data, if necessary.

- Q1)** a) Discuss the problem of clock synchronization in distributed operating systems. Illustrate the Berkeley's clock synchronization algorithm with neat diagram and the drawback of Network Time Protocol (NTP). **[8]**
- b) What is the purpose of Message Passing Interface? Illustrate the architectural model for MPI using send and receive primitives. **[9]**

OR

- Q2)** a) Define External Data Representation, Marshalling and Unmarshalling. Discuss the three alternative approaches to XDR and marshalling. **[8]**
- b) Explain the goal of an Election algorithm. Illustrate the bully algorithm using appropriate diagrams. **[9]**

OR

- Q4)** a) What is checkpointing in a distributed system? Explain the working of Coordinated checkpointing recovery mechanism. **[9]**
- b) Define data-centric consistency model. Explain the causal consistency model with suitable example using distributed shared database. **[9]**

- Q5)** a) What is a Directory Service? What is the difference between DNS and x500? Describe in detail the components of X.500 service architecture. **[8]**
- b) Describe the Sun Network File System architecture in details. **[9]**

OR

P.T.O.

- 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? [8]
- b)** What are web services? Describe with a suitable diagram the general organization of the Apache web server. [9]

- Q7) a)** Explain the following in brief: [9]
- i) Wearable devices
 - ii) PVM
 - iii) JINI
- b)** Explain in brief, the key features of Prometheus including data model, query language, or alerting rules. [9]

OR

- Q8) a)** Explain in brief, the following Distributed System monitoring tools: [9]
- i) Nagios
 - ii) Zabbix
- b)** Explain in brief following Microkernels. [9]
- i) CHORUS
 - ii) Mach

