

B.E.
DISTRIBUTED SYSTEMS
(2008 Pattern) (Semester-II)

Time : 3 Hours]

[Max. Marks : 100

Instructions to the candidates:

- 1) Answers to the two sections should be written in separate answer books.*
- 2) Answer any three questions from each section.*
- 3) Neat diagrams must be drawn wherever necessary.*
- 4) Figures to the right side indicate full marks.*
- 5) Use of Calculator is allowed.*
- 6) Assume suitable data if necessary.*

SECTION-I

- Q1)** a) Compare migration transparency and relocation transparency. **[4]**
b) Explain challenge of heterogeneity in Distributed System and how it is overcome? **[8]**
c) Write a short note on various failure models. **[6]**

OR

- Q2)** a) Explain Peer-to-Peer Architecture and its advantages. **[4]**
b) Give different types of hardware resources and data or software resources that can be shared. Give examples of their sharing as it occurs in Distributed System. **[8]**
c) Define Distributed System. List advantages and disadvantages of the same. **[6]**

- Q3)** a) Explain General Architecture of Message Queuing System along with roles of message broker. **[8]**
b) What are sockets? Specify socket primitives? Draw a diagram specifying connection oriented socket communication. **[8]**

OR

- Q4)** a) Explain different "RPC invocation semantics". **[8]**
b) What is CORBA? Describe the general organization of CORBA system with the help of neat diagram. **[8]**

- Q5)** a) How might the clocks in two computers that are linked by a local network be synchronized without reference to an external time source? What factors limit the accuracy of the procedure you have described? How could the clocks in large number of computers connected by Internet be synchronized? [8]
- b) Describe Cristian algorithm for clock synchronization. [8]

OR

- Q6)** a) Show the instances where we cannot conclude $C(a) < C(b)$ or $C(b) < C(a)$. Draw appropriate timing diagram. [8]
- b) Compare Centralized, Distributed and Token ring algorithms of mutual exclusion with their performance measures. [8]

SECTION-II

- Q7)** a) What is automounting? Explain a simple automounter for NFS and how it help to improve the performance and scalability of NFS? [8]
- b) How is security implemented in CODA file system. [8]

OR

- Q8)** a) Explain in brief basic NFS architecture for UNIX system. [8]
- b) Write a short note on caching and replication in CODA file system. [8]

- Q9)** a) What is consistency model? Explain Monotonic writes and Writes follow reads client centric consistency model? [8]
- b) What is replication? Explain main reasons for replication? [8]

OR

- Q10)a)** Why replicas must be consistent? Explain following Data Centric Consistency Models. [8]
- i) Sequential
 - ii) Weak
- b) Explain design and implementation issues of Distributed Shared Memory in details. [8]

Q11)a) Explain

[8]

i) Flat and Hierarchical groups

ii) Open and closed groups

b) Explain basic reliable multicasting. How it could be made scalable? **[10]**

OR

Q12)a) What is check pointing? Explain independent check pointing and co-ordinated check pointing. **[8]**

b) Explain Byzantine Generals Problem. Why do we need to have $3m + 1$ total processes for system to work correctly, assuming non-faulty commander? **[10]**

