B.E / B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, NOV / DEC 2013
Information Technology/Computer Science and Engineering
V SEMESTER
CS 374 / **IT9304: Distributed Systems**
(Regulation 2008)

Time: Three Hours   Answer ALL Questions   Max.Marks: 100

PART-A (10 X 2 = 20 Marks)

1.   How can a server be located in a distributed environment?
2.   Describe a possible mechanism to implement scalability in a group in distributed environment.
3.   Provide an example of Lamport's logical clock.
4.   What are the possible types of distributed transactions? Give examples.
5.   Name the different types of cache updates. Explain each with an example.
6.   In Ivy, what is the use of probe owner?
7.   Specify the protocols used in message logging scheme.
8.   Distinguish between error, fault and failure using suitable examples.
9.   What is the role of CORBA agent?
10.   How does Jini track a transaction?

PART-B (5 X 16 = 80 Marks)

11.   How would you implement at least once, at most once and exactly once semantics in RPC?   16

12.a) i) Define vector clock. Provide suitable example for vector clock with at least three processes and 10 message passing events.   8
       ii) In Ricart Agarwala's algorithm, how would you minimize the number of messages using timestamp? Show using an example.   8

(OR)

12.b)i) If the statement "without WFG, it is not possible to detect deadlock" is correct, show how this is true in an edge-chasing algorithm.   8
       ii) What is a phantom deadlock? Provide an example to show that in a centralized deadlock detection algorithm, phantom deadlocks appear. What mechanism can be used to solve this problem?   8

13.a)i) In the following diagram, what consistency is achieved? Justify.   8

P1:	W(x)1		W(x) 3
P2:	W(x)2		
P3:		R(x)2	R(x)1 R(x)3
P4:		R(x)1	R(x)2 R(x) 3

ii) What are the different types of scheduling in a distributed system? How dynamic load balancing with process migration is done in a distributed system?   8

(OR)

13.b) i) Distinguish between stateful and stateless servers in a distributed file system. In the presence of server failures, how can file update failure be recovered by the server using the i-node and state information of the file?   8

ii) Describe the architecture of NFS in details with a mention of how the auto-mounter works.   8

14.a) i) Describe the problem in two phase commit protocol. How is it solved in three phase commit protocol?   8

ii) Show that agreement cannot be reached in a five node system in the presence of two byzantine nodes. Give the mathematical model for the same.   8

(OR)

14.b) What are the different types of checkpointing used in a fault tolerant distributed system? How would you build a transparent system with checkpointing?   16

15.a)i) Describe Jini lookup service.   8

ii) In a CORBA system, how does Portable Object Adapter (POA) manage to obtain the object identifier of a servant when one joins the system?   8

(OR)

15b)   Write short notes on the architecture of the followings: 4*4
   i)   CORBA
   ii)   COM+
   iii) DCOM
   iv)   Jini

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