CS6601 – DISTRIBUTED SYSTEMS
QUESTION BANK
UNIT 1 INTRODUCTION
PART A

1. What is a distributed system?
2. Mention few examples of distributed systems.
3. Mention the trends in distributed systems.
4. What are backbones in intranets?
5. Write short notes about webcasting.
6. Define cloud computing.
7. What is a cluster computer? Mention its goals.
8. Write short notes on mobile and ubiquitous computing.
9. What does the term remote invocation mean?
10. What is the role of middleware?
11. What are the challenges of distributed systems?
12. What is mobile code? Give an example.
13. What determines the openness of distributed systems?
14. Mention the characteristics of open distributed systems.
15. What are the 2 security challenges that are not fully met by distributed systems?
16. When a system can be described as scalable in nature?
17. What are the challenges faced by a scalable distributed system?
18. What are the techniques used for dealing failures in a distributed system.
19. How the availability of a system can be measured?
20. Define Transparency. What are its types?
21. What are the non-functional properties of a system that affects its quality of service?
22. What are the main technological components of a web?
23. What is HTML and HTTP?
24. Why HTTP called as request-reply protocol?

PART B

1. Explain the need of Distributed systems its characteristics with example
2. Explain how resource sharing is done in the web
3. Explain the challenges to be considered in the design of DS
4. Explain the design goals to be considered for DS
5. Explain the system model of DS in details
6. Explain the system architecture of DS
7. Explain the Various trends in distributed system

UNIT II COMMUNICATION IN DISTRIBUTED SYSTEM
PART A

1. What are the issues in distributed system?
2. What are the difficulties and threats for distributed systems?
3. What is a physical model?
4. What is meant by Distributed systems of systems/ Ultra-Large-Scale (ULS) distributed systems?
5. What are the three generations of distributed systems?

6. What is a Web Service?
7. What is a cache?
8. Define Mobile Agent.
9. What are thin clients?
10. What is meant by Reflection?
11. What do you mean by masking failures?
12. Define marshalling and Unmarshalling
13. What is meant by XML (extensible Markup Language)?
14. What do you mean by XML prolog?
15. What are XML namespaces?
16. What do you mean by XML schemas?
17. What is a Remote object reference?
18. What is a multicast operation?
19. What is a overlay network?
20. What is a service interface?
21. What is an IDL?
22. What do you mean by may be semantics?
23. What is meant by At-least-once semantics?
24. What is meant by At-most-once semantics?
25. What is meant by Garbage collection?
26. What do you mean by a Servant?
27. What is meant by Group communication?
28. Define Closed and open groups.
29. Define Overlapping and non-overlapping groups.
30. What is meant by FIFO ordering?
31. What is meant by Causal ordering?
32. What do you mean by publish-subscribe system?

PART B

1. Discuss the design and implementation issues in Remote Method Invocation. (JUN 2012)
2. Describe the architecture for multi-threaded servers. Discuss the issues related to thread programming, thread lifetime, thread synchronization, scheduling and implementation. (JUN 2012)
3. Explain how a forwarded observer may be used to enhance the reliability and performance of objects of interest in an event service. (MAY 2015)
4. Explain the remote procedure call mechanism with various functional components. (MAY 2015)
5. Explain the factors that motivate the hybrid scheduling approach of the scheduler activation design. (MAY 2015)
6. Explain how shared region could be used for a process to read the data written by the kernel. (MAY 2015)
7. Draw the block diagram and describe the various modules for implementing RMI. (MAY 2011)
8. Describe the java distributed garbage collection algorithm. (MAY 2011)
9. Describe the organizations of DNS. (MAY 2011)
10. Write short notes on Distributed object and explain how communication is performed between Distributed Objects.

11. Define a simple client-server program to send a pass two values to a server. The server adds the values and returns the result to the clients. List the steps to execute the same.

a. Interface

b. Server object

c. Server Program

d. Client Program

e. Steps to execute the Program

12. Explain Java RMI.
13. What is IPC? Explain the IPC in UNIX Systems.
14. Define Group Communication and explain with suitable example.

UNIT III PEER TO PEER SERVICES AND FILE SYSTEM

PART A

1. What is the use of middleware?
2. Write about the parts available in routing algorithm?
3. Define multicast communication?
4. What are the Application dependencies of Napster?
5. Define Routing overlay.
6. What is a file group?
7. What is flat file service interface?
8. Write a note on Andrew file system?
9. Write a note on X.500 directory service?
10. What is the use of iterative navigation?
11. Define multicast navigation?
12. What are the major goals of Sun NFS?
13. What is a Name Service?
14. Define Namespace.
15. Illustrate the importance of Caching.
16. Define DNS with examples
17. Write short notes on Directory Services.
18. Write about LDAP.
19. What are the non-functional requirements that peer-to-peer middleware must address?
20. What is the key problem faced in peer-to-peer middleware.
21. What are the characteristics of peer-to-peer systems?
22. What is the use of GUID?

PART B

1. What is name service? What are its goals? How it is implemented? What is directory service? (JUN 2012)

2. Name all modules of file system operations and write in detail about distributed file system requirements. (JUN 2012)

3. Discuss the mounting issues of remote file systems on NFS client. (JUN 2012)

4. Explain Sun NFS. (MAY 2015)

5. Compare the update semantics of UNIX when accessing local files with those of NFS and AFS. Under what circumstances might client become aware of the difference? (MAY 2015)

6. What security issues are liable to be relevant to a directory service such as X.500 operating within an organization? (MAY 2015)

7. Explain DNS. (MAY 2015)

8. Write notes on (MAY 2011)
   - Thread life time
   - Thread Synchronization
   - Thread scheduling

9. Write notes on microkernels(MAY 2011)

10. Explain Lamports concepts of logical clocks. (MAY 2011)

11. Explain Cart and Agarwala's algorithm for distributed mutual exclusion. (MAY 2011)

12. Explain the architecture and server operation of NFS and DFS.

13. Explain. How does SUN NFS simplify crash recovery.

UNIT IV SYNCHRONIZATION AND REPLICATION
PART A

1. What is clock synchronization?
2. What do you mean by clock skew and clock drift?
3. What do you mean by Coordinated Universal Time?
4. Define External Synchronization.
5. When an object is considered to be garbage?
6. What do you meant by Distributed debugging?
7. Define marker receiving rule.
8. Define marker sending rule.
9. Define total ordering?
10. Name any two election algorithms.
11. What do you mean by atomic transaction?
12. What are the ACID properties of a transaction?
13. Define the characteristics of serial equivalent transactions.
14. What are the advantages of nested transactions?
15. What are the rules of committing nested transactions?
16. Write short notes on strict two phase locking
17. What are the drawbacks of locking?
18. Define the approach of two phase commit protocol.
19. How is distributed dead lock detected?
20. What is a phantom deadlock?
21. What is wait-for-graph?
22. Define Edge chasing
23. What is the role of replication in distributed systems?

PART B

1. What is the goal of an election algorithm? Explain it detail. (JUN 2012)

2. Explain how mutual exclusion is handled in distributed system. (JUN 2012)

3. Describe the internal and external synchronization of Physical clocks. (JUN 2012)

4. Explain the Chandy and Lamports snapshot algorithm for determining the global states of distributed systems. (JUN 2012)

5. Explain snapshot algorithm with example. (MAY 2015)

6. Discuss about NTP. (MAY 2015)

7. Explain Ricart and Agarwala's algorithm.(MAY 2015)

8. Show that byzantine agreement can be reached for three generals, with one of thm faulty, if the generals digitally sign their message. (MAY 2015)

9. Describe optimistic concurrency control mechanism. (MAY 2011)

10. Compare the various methods of concurrency control. (MAY 2011)

11. Describe the 2 PC for nested transactions. (MAY 2011)

12. Describe the distributed deadlock detection algorithms. (MAY 2011)

13. Examine Chandy and Lamport's snapshot recording algorithm for determining the global states of Distributed Systems

14. Describe briefly about multicast communication.

UNIT – V PROCESS & RESOURCE MANAGEMENT
PART – A

1. What is process migration?
2. What are the advantages of process migration?
3. What are the activities involved in process migration?
4. Mention the levels of transparency in process migration.
5. What is Threads?
6. What are the main advantages of using threads instead of multiple processes?
7. Mention the models used to organize the threads of a process.
8. Define critical region.
9. Define mutex variable.
10. Mention some library procedures for managing the threads.
11. Mention the types of mutex variables.
12. Write short notes on resource management.
13. What are the features of global scheduling algorithm?
14. What is Task assignment approach?
15. Define Load balancing approach.
16. What are the issues in designing load balancing algorithm.
17. What is load-sharing approach?
18. State the differences between the static and dynamic load balancing algorithms.
19. State the differences between the deterministic and probabilistic load balancing algorithms.
20. What is threshold?
21. What is static policy and dynamic policy?
22. Write the priority assignment policies.
23. Write about sender-initiated location policy.
24. What is receiver-initiated policy?

PART B

1. Contribute your comments on granularity and page replacement issues in the design of distributed shared memory systems. (JUN 2012)

2. Explain the different consistency models for distributed. (JUN 2012)

3. Discuss about design and implementation issues of DSM. (MAY 2015)
4. Describe sequential consistency DSM. (MAY 2015)
5. Describe CORBA RMI and its services. (MAY 2015)
6. Describe the various measures to be taken in designing secure systems. (MAY 2011)
7. Describe the Needham Schroeder authentication protocol. (MAY 2011)
8. Explain the cryptographic algorithms. (MAY 2011)
9. Write short note on Replication. (MAY 2011)
10. Explain CORBA Interface Definition Languages.
11. Explain sequential consistency and IVY case study.
12. Describe the notion of coherence supported in Ivy Systems.
13. Explain the different consistency models for distributed.