Module No-1

Short Questions (for 2 Marks)

1. What is distributed computing?
2. Explain distributed computing system?
3. Explain tightly coupled system. How are they different from distributed computing system?
4. Define Distributed computing system. What are remote source.
5. Explain Distributed computing systems models with diagram.
6. Explain briefly DC models.
7. List different DC models with examples.
8. Write short note :
   (i) Minicomputer model (ii) Workstation model
   (iii) Workstation-server model (iv) Hybrid model
9. Compare and contrast workstation and workstation-server model.

Long Question (for 5 Marks)

1. Explain goals of Distributed computing.
2. Why Distributed computing is gaining popularity?
3. Explain :
   (i) Resource sharing (ii) Reliability
   (iii) Flexibility (iv) Autonomy
4. What is OS? Explain DOS.
5. What is NOS and DOS?
6. Compare DOS and NOS as platforms for Distributed Systems.
7. Explain :
   (i) System Image (ii) Autonomy (iii) Fault tolerance capability
8. Explain primary use of OS. How can DCS classified.
9. Explain in brief fault tolerance capability.
10. Explain design issues in D.S.
11. Write short notes on :
    (i) Transparency (ii) Security (iii) Heterogeneity (iv) Performance
12. Explain Distributed Computing Environment (DCE).

Long Question (for 10 Marks)

1. How was DCE created? What are its components?
2. Explain DCE cells.
3. Compare and contrast between parallel and distributed systems.
4. Explain parallel systems.
5. List and elaborate advantages and disadvantages of Distributed system.
6. Compare and Contrast centralized and decentralized systems.
7. What are the desirable features of an Open Distributed Systems?
8. What are the major issues in designing a distributed operating system?
9. Write short note on DCOM.
10. Explain the reasons why the use and popularity of distributed systems are rapidly increasing, despite the increased complexity and difficulty of building it.

Module No-2

Short Questions (for 2 Marks)

1. What is RPC?
2. Write short notes on :
   (i) Stub generation

   (ii) Extermination

   (iii) Reincarnation

   (iv) Expiration
3. How to Marshall arguments and results?
4. Explain :
   (i) Instance per session

   (ii) Instance per call

   (iii) Persistence
5. Explain :
   (i) Request protocol

   (ii) Request / reply protocol

   (iii) Request / reply / acknowledge - reply protocol.
6. Define :
   (i) Binding time
   (ii) Server naming
   (iii) Server locating
   (iv) Binding agent
   (v) Changing binding
   (vi) Simultaneous Bindings

Long Question (for 5 Marks)

1. Give the steps occurring in RPC.
2. Explain the RPC model.
3. Explain the design issues of RPC in detail.
4. How to implement RPC mechanism?
5. Explain the advantages of RPC.
6. Explain transparency in term of RPC. Why is it difficult to achieve? List the limitations of RPC.

7. Explain how transparency is achieved in Remote Procedure Calls.
8. Explain the types of failure that can occur in RPC system.
9. Explain RPC messages.
10. How to Marshall arguments and results?
11. Explain the concept of server management.
12. Explain server implementation and reaction issues.
13. Explain Stateful file servers and Stateless file servers and its advantages.
14. Write short notes on :
    (i) Stateful server

    (ii) Stateless server

15. Compare and contrast stateful and stateless servers.
16. Which server is preferred and why?
17. Explain server creation semantics.
18. Explain call by value and call by reference.
19. Write in brief about RPC call semantics.
20. Explain communication protocols for RPC.

Long Question (for 10 Marks)

1. Write in brief about RPC call semantics.
2. Explain communication protocols for RPC.
3. What are complicated RPCs? Explain their types.
4. Explain complicated RPCs. Explain the procedure to handle complicated RPCs.
5. How does client know whereabouts of server? What is it called?
6. Explain client-server Binding.
7. Explain how security is implemented in RPC.
8. What are special RPCs? Explain their types.
9. How can RPC be deployed in heterogenous environment?
10. What are lightweight RPC? Explain cross domain and cross machine calls.
11. What are stubs? Explain in detail.
12. How to optimize RPC for better performance.
13. What are the parameter passing-semantics of RPC?
14. What makes a RPC complicated? Discuss the protocols for handling some of the complicated RPCs.
15. Write short notes on :
    (i) Lightweight RPC

    (ii) Stateful and Stateless File Servers

16. What are the main similarities and differences between the RPC Model and the ordinary procedure call model?
17. What are the stateful and stateless servers?
18. What are the different failure that can occur in RPC system? Discuss the solutions for these failures.
19. Explain RPC system model in detail.
20. Explain the difference between OSI and TCP/IP Model.
21. Describe OSI Reference Model with a neat diagram.

22. Explain the working of network components and state in which layer they work. Repeaters, Hubs, Bridges, Switches, Routers, Gateways.

Module No-4

Short Questions (for 2 Marks)

1. Explain
   (i) Stability (ii) Scalability (iii) Fault tolerance of DFS

2. Write short notes on :
   (i) Task assignment approach

   (ii) load balancing approach

   (iii) load sharing approach

3. Explain brief :
   (i) Deterministic versus probabilistic

   (ii) Centralized versus distributed

   (iii) Co-operative versus non co-operative

Long Question (for 5 Marks)

1. Distinguish between thread and process.
2. Explain thread package. Explain issues in designing a thread package.
3. How to synchronize thread?
4. Write short note on thread synchronization
5. Explain thread scheduling.
6. How to implement a threads package?
7. Explain signal handling.
8. What are the common strategies sued for handling deadlocks in distributed systems.
9. Differentiate between Process and Threads using proper examples.
10. What are the issues in designing Load Balancing algorithms?
11. Describe the different models for organizing threads. Explain the working of a multi-threaded server.
12. Write short note on Process Migration in Heterogeneous systems.
13. Compare processes and threads. Explain user and kernal level threads execution and also the need of light-weight threads.
14. Write short note on Issues in Designing Load Sharing Algorithms.

Long Question (for 10 Marks)

1.What are resource and process?

1. Explain resource management.
2. What is a global scheduling algorithm?
3. List and explain the desirable towards of good global scheduling algorithm.
4. What are different techniques for scheduling processes?

5. Elaborate in brief about a scheduling technique.
6. Explain the different Load estimation policies and process transfer policies used by load balancing algorithms.
7. Explain the taxonomy of load balancing algorithms.
8. Explain the issues in designing load balancing algorithms.
9. Explain process transfer policies.
10. Explain location policies.
11. State information exchange policies.
12. Explain load-sharing approach.
13. Explain process management.
14. What is process integration. Explain in detail.
15. What are threads?

Module No-3

Short Questions (for 2 Marks)

1. Explain :
   (i) Cristian's Algorithm

   (ii) Benkeley algorithm

   (iii) Logical clocks

   (iv) Lamport timestamps

Long Questions (for 5 Marks)

1. What is synchronization? Explain.
2. Define Synchronization. Explain clock synchronization.
3. What are physical clocks?
4. List all clock synchronization algorithms. Explain any one in detail.
5. Explain the different distributed physical clock synchronization algorithms with their relative advantages and disadvantages.
6. What are synchronized clocks?
7. Explain the distributed algorithms for clock synchronization.
8. What is NTP?
9. Explain the idea of timestamps. What is Lamport timestamp? Explain in detail.
10. Define Multicasting. Explain totally-ordered multicasting.
11. Explain clocks. Explain its types.
12. Explain global state. What is its importance?
13. Discuss Election algorithms. Why are they called so?
14. Write detailed notes on :
    (i) Bully Algorithm

    (ii) Ring Algorithm

15. Explain mutual exclusion.
16. How to achieve mutual exclusion?
17. Compare and contrast Mutual Exclusion Algorithms.
18. Compare and contrast centralized and distributed algorithm.
19. Explain token ring algorithm.

Long Questions (for 10 Marks)

1. Compare election algorithm.
2. Explain the different distributed physical clock synchronization algorithms with their relative advantages and disadvantages.
3. Describe the different approaches for deadlock detection in DS.
4. Write short note on Ricart Agrawala Algorithm-merits and Demerits.

5. Explain distributed algorithm for mutual exclusion. What are the advantages and disadvantages of it over centralized algorithms?
6. Explain the process of synchronization physical and logical clocks.

Module No-5

Short Questions (for 2 Marks)

1. Explain Fault tolerance.
2. Differentiate : Replication vs Caching?
3. Write short note on Fault Tolerance.

Long Questions (for 5 Marks)

1. Give advantages and disadvantages of Block-level, File-level transfer model and Byte-level transfer model.
2. Explain File-sharing semantics.
3. Explain File-caching schemes.
4. Explain File-replication in detail.
5. What are the issues in file replication?
6. Write short notes :
   (i) Read only replication

   (ii) Available-copies protocol

   (iii) Read-Any-Write All protocol

   (iv) Primary copy protocol

   (v) Quorum- Based protocol

7. Discuss file caching for distributed system.

Long Questions (for 10 Marks)

1. What are the advantages of permanent storage?
2. What does distributed file system normally support?
3. What kind of services DFS provides?
4. What are the desirable features of a good DFS?
5. What are the main approaches to verify the validity of cached data in DFS?
6. What are unstructured and structured files?
7. Explain mutable and Immutable files.
8. Explain in depth file accessing models.
9. With neat diagrams, explain the failure handing mechanisms for message passing.
10. What are the good features of a Distributed File Systems? Explain file sharing sematics of it.
11. Write short note on Distributed Transaction Management.
12. What do you mean by a Consistency Model? Explain the available consistency models and the requirements of the systems which support them.