Muffakham Jah College of Engineering and Technology

Computer Science and Engineering Department

BE (CSE) VII Semester: (CBCS) PC 704 CS Distributed Systems Theory

**Question Bank**

Unit-1 (Part-A)

1. **State the goals of Distributed Systems.**
2. **List the different types of Distribution Transparency.**
3. Define the role of middleware in Distributed Systems.
4. Define the different types of Architectural Styles.
5. State the levels of three-tiered client-server architecture.
6. Explain the principle of TCP handoff.
7. Define Asynchronous RPC.
8. **Differentiate between Asynchronous and Synchronous RPC (draw Diagram)**
9. Differentiate between Continuous (representation) media and Discrete (representation) media
10. **Define the following types of communication.**
    1. **Persistent b. Transient c. Asynchronous d. Synchronous**

Unit-1 (Part-B)

1. Explain the centralized system architecture of distributed systems.
2. Describe the role of a TP (Transaction Processing) Monitor in distributed systems.
3. **Define distribution transparency and explain different types of transparency.**
4. **Explain the different distributed system architectural styles.**
5. Describe Multitiered Architectural styles for distributed systems.
6. Describe the logical organization Feedback Control System.
7. **Explain the different Thread Implementation Approaches.**
8. **Describe the different architectures of Virtual Machines.**
9. Write about server clusters.
10. **Describe the different alternatives for code migration**.
11. Explain the different types of communication.
12. Describe the different steps in an RPC.
13. Describe the General Architecture of a Message-Queuing System.
14. Describe the role of Message Brokers in a Message Queuing System.

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**Question Bank**

Unit-2 (Part-A)

1. List the properties of a true identifier.
2. Define a location independent identifier and give example.
3. Define proximity routing.
4. Describe the three logical layers into which namespace is partitioned.
5. **List the different DNS Resource Record types.**
6. **Define Clock Skew and Maximum Drift Rate (clock drift)**
7. **State the Lamport’s Happen-before relation.**
8. **Define Monotonic-Read and Monotonic-Write Consistency.**
9. Define Sequential and Causal Consistency.
10. Define i. Read Your Writes and ii. Writes Follow Reads.

Unit-2 (Part-B)

1. Explain with example the principle of Iterative name resolution.
2. Explain with example the principle of Recursive name resolution.
3. **Describe the Berkley clock synchronization algorithm.**
4. Explain the NTP clock synchronization algorithm.
5. **List the Physical Clock Synchronization algorithms and explain any one.**
6. **Compare the different Mutual Exclusion approaches**.
7. **Explain the distributed algorithm for Mutual Exclusion.**
8. **Describe the Bully’s Election Algorithm.**
9. **Explain the Ring based Election Algorithm.**
10. Distinguish between Permanent, Server-Initiated and Client-Initiated Replicas.
11. Compare Push-based and Pull-based protocols.
12. Describe Primary backup protocol.
13. Describe Replicated-Write Protocols.
14. Discuss Cache-Coherence Protocols.

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**Question Bank**

Unit-3 (Part-A)

1. **State the four requirements of Dependable Systems**.
2. **List the Classification of Faults.**
3. Define the terms: Orphan Extermination, Reincarnation, expiration in reference to Client crashes.
4. **Distinguish between Backward and Forward Recovery.**
5. **Distinguish between Persistent and Transient distributed objects.**
6. Define Unordered, FIFO-ordered, Causally-ordered and Totally-ordered multicasts.
7. List the four kinds of EJBs.

Unit-3 (Part-B)

1. **Describe with an example the Byzantine Agreement Problem**
2. **Explain the different types of Failures.**
3. Explain the different combinations of client and server strategies in the presence of server crashes.
4. Distinguish between Unordered, FIFO-ordered, Causally-ordered and Totally-ordered multicasts.
5. **Explain the distributed 2-Phase Commit Protocol.**
6. **Explain the distributed 3-Phase Commit Protocol.**
7. Describe Stable Storage Recovery.
8. Explain Checkpointing approach for Recovery.
9. **Differentiate between the four kinds of EJBs**.
10. Distinguish between Static and Dynamic RMI.
11. **Explain CORBA’s callback and polling models for asynchronous method invocation.**
12. Explain about CORBA’s Object References.

Unit-4 (Part-A)

1. **Distinguish between Remote Access and Upload/Download models of file access.**
2. **State the function of NFS Automounter.**
3. List the four ways of dealing with the shared files in distributed systems.
4. List the six top-level MIME types.
5. **Write about the two types of HTTP connections.**
6. List the different HTTP request methods.
7. **Differentiate between URI, URN and URL.**

Unit-4 (Part-B)

1. **Explain the NFS architecture.**
2. **Describe RPC in NFS.**
3. **Explain File Locking in NFS.**
4. **Describe Client side Caching in NFS.**
5. Describe the NFS security architecture.
6. **Describe SOAP protocol.**
7. **Describe Apache Web Server.**
8. **Google File System**
9. Discuss Web Proxy Caching in distributed web based systems.

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**Question Bank**

Unit-5 (Part A)

1. **List the modules of HADOOP**.
2. State the purpose of Namenode and Datanode of HDFS.
3. Depict data flow in MapReduce.
4. **Differentiate between Map and Reduce functions** / **state purpose of Map and Reduce functions in MapReduce.**
5. **Differentiate between information, subscription and publication confidentiality w.r.t. distributed coordination based systems**.
6. **What is Hive?**

Unit-5 (Part B)

1. **Describe the different coordination models.**
2. **Explain Content-Based Routing.**
3. Discuss fault tolerance in shared dataspaces.
4. **Describe MapReduce Programming model.**
5. **Differentiate between HIVE and PIG**
6. **Write about self management of Distributed systems**
7. **The future of Emerging trends**
8. **Discuss about Grid and Cloud Computing**

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| S.No. | Group Question | Roll No. |
|  | Write the case study of CORBA, DCOM and GLOBE and compare them. | 1-10 |
|  | Discuss the architecture of Google File system using a diagram | 11-20 |
|  | Write about integral parts of Hadoop Ecosystem –Pig and Hive | 21-30 |
|  | Discuss architecture of Distributed coordination based systems  Describe with an example **the Byzantine Agreement** Problem | 31-40 |
|  | Discuss Virtualization | 41-50 |
|  | Discuss the architecture of SUN-NFS using a diagram | 51-60 |
|  | Discuss the future of emerging trends | Lateral entries |
|  | Write about REST and Web services |
|  | Write about Grid computing |
|  | Write about SOAP |