Unit-I

1. **Introduction.**
Distributed computing Concepts, Basic network concepts, Basic operating system concepts.

2. **Inter process Communication.**
Basic model, Primitives (operations): connect, send, receive, disconnect, Connection-oriented/connectionless, Data marshalling: data flattening, data representation, serialization, Event synchronization, Event diagram, sequence diagram.

3. **Distributed Computing Paradigms.**
Message passing, client server, P2P, message system, RPC, Distributed Object Paradigm, Object Space, Mobile agent, Network services, Groupware paradigms, SOA, Overview & comparison of each paradigm.

Unit-II

4. **The Socket API.**
The basic model, Stream-mode (connection-oriented) socket, Datagram socket (connectionless) socket, Java socket API, Using socket to implement a client. Using socket to implement a server, A simple middleware using sockets, Secure sockets and the Java secure socket extension API.

5. **The Client-server Paradigm.**

6. **Group Communications.**
Unicast versus multicast, Basic model of group communications, The Java multicast API. Sample multicast sender program, Sample multicast listener program, Multicast and message ordering, Reliable multicast/broadcast.

Unit-III

7. **Distributed objects.**
Message passing versus distributed objects, The basic model, Remote procedure call, Remote method invocation, CORBA Historical Perspective

8. **Advanced Remote Method Invocations (RMI).**
RMI stub downloading, Security policy, Callback.

9. **Internet applications.**

Text books:

1. Distributed Computing: Principles and Applications, M L Liu, Pearson Publisher.
2. Distributed Systems Concept and Design, George Coulouris, Jean Dollimore and Tim Kindberg, Pearson Publisher.