**Master of Computer Science**

**Semester – II**

**Advance Networking Concepts**

**Question Bank**

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**Chapter 1:-Review of Basic Concepts**

1. Why are computer networked?
2. Define – Network Architecture.
3. What is the purpose of layering?
4. Define the terms:-
   * Protocols
   * Services
   * Interfaces
5. Explain OSI Reference model.
6. State the purpose of following layer-
   * Physical Layer
   * Data Link Layer
   * Network Layer
   * Transport Layer
   * Session Layer
   * Presentation Layer
   * Application Layer
7. Describe TCP/IP reference model in brief.
8. List Various protocols use in TCP/IP reference model. Explain the purpose of each.
9. State the difference between LAN & WAN.
10. Explain CSMA/CD.
11. Differentiate between ESS & BSS
12. What is the use of LIC and MAC layer in Ethernet?
13. Explain the architecture of wireless LAN.
14. Explain the Gigabit Ethernet Implementation.
15. Discuss the advantages of FRAME RELAY over X.25. Also explain architecture of FRAME RELAY.
16. State any two intradomain protocols with an example of each.
17. What is meant by best effort delivery?
18. State the different design goals of ATM.
19. What is switched WAN? State common switched WANs.
20. What is an Ethernet? Explain it.
21. Explain access method used in wireless LAN.

**Chapter 2 :- The Internet Layer Protocol**

1. “IP is an unreliable connectionless protocol which provides best effort delivery service” Comment on the statement.
2. What are the basic requirements for an internet? Discuss these requirements with reference to an IP.
3. Describe the IPV4 header in details along with the neat diagram.
4. Explain the importance of Total length field in IP header.
5. State the importance of fragmentation.
6. Explain automatic tunneling and configured tunneling used for IPV6.
7. Explain the process of IP datagram Fragmentation and reassembly.
8. What are the pros and cons of intermediate reassembly of an internet fragmented datagram verses reassembly at the final destination?
9. What is the header overhead in an IP protocol?
10. Describe ICMP message format in brief.
11. What is the purpose of ICMP?
12. What are various types of messages supported by ICMP?
13. Define source-quench message format of ICMP, why it is used?
14. Write short note on error reporting messages.
15. List the types of errors handled by ICMP. Explain any one in detail.
16. Describe the query messages under ICMP.
17. State and explain in brief different error reporting messages in ICMPV6.
18. State the deficiencies of IPV4 that overcome by IPV6.
19. State extension headers in IPV6.
20. Describe compactible and mapped addresses.
21. Describe primary and secondary servers.
22. In ICMPV6 which messages are used instead of ARP and IGMP protocols in ICMP4?

**Chapter 3 :- BOOTstrap and Autoconfiguration**

1. What is meant by bootsrap protocol?
2. Describe the operation of BOOTP protocol.
3. Explain the BOOTP message format.
4. Describe how auto configuration of host is done in DHCP.
5. Explain the DHCP mechanism in brief.
6. How the computer does knows its IP address when it is booted for the first time or from diskless workstation?
7. Explain option field with DHCP packet in detail.
8. How BOOTP performs operation when client and server on two different networks?
9. Explain how DHCP provides dynamic address allocation?
10. Explain what are the steps involved in using BOOTP protocol.
11. How to use TFTP with BOOTP?
12. Explain Address Resolution Protocol.
13. Describe DHCP transition states with DHCP transition diagram.

**Chapter 4 :- Routing Protocols**

1. What is the difference between static table and dynamic table?
2. Why it is necessary to use dynamic routing tables in routers?
3. Define :-
   * Unicast
   * Multicast
   * Broadcast
4. Explain the concept and need of metric in network.
5. What is the purpose of RIP? State the function of RIP messages.
6. Why would an internet offer an Autonomous System?
7. What is Autonomous System?
8. Describe various multicast applications.
9. What is the difference between Interior Routing Protocol and an Exterior Routing Protocols?
10. Explain the RIP protocol in brief.
11. Write a short note on OSPF protocol.
12. Define the following:

* Area
* Border Router
* Autonomous System Border Router
* Area Border Router
* Backbone Router

1. Name the four types of OSPF connection.
2. Discuss the types of links used in OSPF.
3. What is the purpose of the link state advertisement?
4. Explain the BGP in brief.
5. What is the difference between unicast routing and multicast routing?
6. What is the role of Dijkstra algorithm in unicast routing?
7. What is the need of IGMP in unicasting? Give different types of IGMP messages and state their functions.
8. What is the difference between source-based tree and group-based tree?
9. List types of BGP messages.
10. Explain RIP message format with neat diagram.
11. Explain three different levels of addresses used in TCP/IP.
12. How three instability problem is handled in distance vector routing?
13. Explain all types of BGP messages.
14. Explain the remedies for two node instability.
15. What is metric used by RIP? How to define infinity in RIP?
16. What is RIP? Describe timers in RIP.

**Chapter 5 :- The Transport Layer**

1. What are the services provided by transport layer? Explain in brief.
2. Explain the transport layer service primitives.
3. What is the difference between process-to-process delivery and host-to-host delivery?
4. Explain the socket primitives of TCP.
5. How is a well known port different from normal port?
6. Describe the various issues addressed by transport layer protocol.
7. Explain the connection Establishment and Connection release phases of transport protocol.
8. What is a socket address?
9. When is a three way handshake used?
10. Write a short note on:-
    * Two Army Problem
    * Transport Protocol
11. Explain the need of upward and downward multiplexing in transport layer.
12. Why would an application use UDP instead of TCP?
13. Explain the user datagram format for UDP.
14. What is the remote procedure call?
15. Explain open-loop and closed loop congestion control.
16. In cases where reliability is not primary importance, UDP would make a good transport protocol. Give examples of specific case.
17. Explain the complete RPC with the help of request/reply paradigm.
18. State the role of client stub and server stub in RPC.
19. Explain the segment format of TCP. State the function of each field.
20. What is the purpose of sequence number in TCP packet?
21. What is the purpose of flow control?
22. Explain how flow control is handle
23. Explain the slow start algorithm of congestion control.
24. What is the silly window syndrome?
25. Explain the sliding window protocol mechanism.
26. Describe the connection management using finite state machine.
27. What is Nagle’s algorithm?
28. What methods can prevent a silly window syndrome created at the receiver?
29. How can TCP handles urgent data?
30. Write a short note on Congestion control in TCP.
31. What is pseudo header?
32. Draw and Explain TCP header.
33. How TCP can handle congestion?
34. Explain three way handshake method used for connection establishment in TCP.
35. Explain the four way hand shaking method used for connection establishment in TCP.
36. Explain the services offered by TCP to process at the application layer.
37. What is the purpose of Sequence No. and Ack. No. in TCP?
38. Explain the three-node instability problem.
39. State the different services not provided by UDP.
40. What is the purpose of URG, PSH,SYN and FIN flags in TCP?
41. Explain the different scenario’s for releasing a connection.
42. What are the different states in the finite state machine of TCP?
43. Nagle’s algorithm and Clark’s solution to the silly window syndrome are complimentary. Is it true? Justify.
44. How data transfer takes place in TCP after connection establishment?
45. Explain three way handshake method used for connection termination in TCP.
46. List various options of TCP header.
47. What I the maximum size of TCP header?
48. What is the minimum size of TCP header?
49. Suppose a TCP connection is transferring a file of 4000 bytes. The first byte is numbered 10001. What is the sequence number for each segment if data is in four segments each carrying 1000 bytes?

**Chapter 6 :- Socket and Clients-Server Model**

1. Explain the client-server paradigm of interaction.
2. Describe the functions of client/server software.
3. What is concurrency? Why it is required in server software?
4. How concurrency is handled in client-server model?
5. What is a process?
6. What is a socket? Explain socket interface.
7. Explain the socket primitives in TCP.
8. What are socket system calls?
9. What are the various socket system calls used in client/server communication?

Explain in brief.

1. Explain the client-server implementation for connection less application.
2. Explain the client-server implementation for connection oriented application.

**Chapter 7 :- The Application Layer**

1. Which protocol is used by DNS if message is less than 512 bytes and on which port number?
2. State the port defining commands send from FTP client control process.
3. Which are the two techniques used for audio compression?
4. Explain the error control mechanism of TFTP.
5. What are the key elements of SNMP? Explain interaction between manager and agent.
6. Describe architecture of World Wide Web.
7. Why Network Virtual Terminal(NVT) is used? Explain its character set in brief.
8. What is the purpose of SIP? Explain SIP message types.
9. How audio/video files can be downloaded using a media server approach?
10. How the TELNET allows a user to log on to a remote computer?
11. Explain Real Time Transport Protocol(RTP) packet format.
12. What is a name space?
13. How many types of messages are used in TFTP and why?
14. Explain control and data connections used in FTP.
15. Explain the architecture of email.
16. How audio and video files can be downloaded using web server and with metafile approach?
17. Explain query and response messages used in DNS.
18. Discuss all Telnet implementation modes of operation.
19. Write a short note on SNMP.
20. How message is exchanged between client and server in SMTP?
21. Differentiate Hypertext and Hypermedia.
22. State the organization types described by generic domain mil, coop, pro, aero.
23. Explain the various options used for embedding in Telnet.
24. Explain with example how IAC is used in Rlogin.
25. What do you think would happen if the control connection is accidentally served during an FTP transfer?
26. Why do we need an PRQ or WRQ message in TFTP? Explain.
27. Give an example of a situation in which one to many alias expander would be useful.
28. Explain the use of SNMP. What are basic ideas on which SNMP management is based?
29. How to use metafile for accessing audio, video files from the server?
30. Why do you require NVT character set?
31. State the country domains for United States, Netherlands , Japan and India
32. Explain in brief the JPEG process.
33. State any four simple data types of SNMP.
34. What are the different server side system calls in ‘c’?
35. Explain in brief broad categories of documents in www.
36. Explain the most common compression technique used to create CD-quality audio. State the data rates produced by MP3.
37. What are the different services of typical user agent?
38. What is URL?
39. Explain various file transfer commands used by FTP. Explain RTCP.
40. Explain SMI.
41. What is DNS? Discuss it with various domains.
42. Describe HTTP.
43. Explain various steps in creating and storing of cookies.
44. State NVT character for:
    * Erase Line
    * Agreement to enable option
    * Sub option end
    * Approval to option request.
45. In DNS, a resolver sends a query message to a local server to find an IP address for host “chal.fhda.edu”. Show the query message, make necessary assumptions.
46. Explain why the client issues an active open for control connection and passive open for data connection in FTP.
47. Describe role of SNMP, why MIB is required?
48. Why does RTP need service of another protocol, RTCP, but TCP does not?