

GUJARAT TECHNOLOGICAL UNIVERSITY

DI -5 SEMESTER – OLD PAPER – W23 TO S25 – QUESTION BANK(English)

Subject Name & Code:

Advance Computer Network- 4350706

Unit 1 - Network Layer Protocols

Repeated Questions:

1. **Draw and Explain IPv4 Datagram Header Format.**
 - **Appeared in:** S24 (Q1c, 05 marks), WIN24 (Q1c-OR, 07 marks), SUM25 (Q1c, 07 marks)
2. **Explain the concept of fragmentation in IPv4 with example.**
 - **Appeared in:** WIN24 (Q1c, 07 marks)
3. **A classless IPv4 address is given as 192.168.1.12/26. Find the following: (1) Subnet Address (2) Subnet Mask (3) Broadcast Address (4) No. of hosts possible within the subnet.**
 - **Appeared in:** WIN24 (Q1b, 04 marks)
4. **Find the Subnet Mask, Subnet address and Broadcast address for the classless IPv4 address 193.57.32.150/25.**
 - **Appeared in:** S24 (Q1a, 03 marks)
5. **An organization is granted block 212.18.190.0/24. The administrator wants to create 32 subnets. Find: 1. Subnet mask 2. Number of addresses in each subnet 3. First and last address in subnet 1 4. First and last address in subnet 32.**
 - **Appeared in:** WIN23 (Q1c, 07 marks)
6. **Consider the following IP addresses 214.229.206.83/28 and 153.120.147.39/26. Find for each: 1. Network Address 2. First Host Address 3. Last Host Address 4. Broadcast Address.**
 - **Appeared in:** WIN23 (Q1c-OR, 07 marks)
7. **Explain different types of ICMPv4 messages.**
 - **Appeared in:** S24 (Q1e, 05 marks), SUM25 (Q1b, 04 marks)
8. **The following is a dump of a UDP header in hexadecimal format. Find the (a) Source port number (b) Destination Port number (c) Total Length of the UDP Header (d) Length of the data.**

- **Example Hex Dump:** 0045DF0000580000 (WIN23 - Q4a, 03 marks), 0056012200480000 (WIN24 - Q4b, 04 marks), 05DC0035001D0000 (S24 - Q4b, 04 marks)
- **Appeared in:** S24 (Q4b, 04 marks), WIN23 (Q4a, 03 marks), WIN24 (Q4b, 04 marks)

9. Differentiate/UDP and TCP.

- **Appeared in:** WIN23 (Q4b, 04 marks), WIN24 (Q4a, 03 marks), SUM25 (Q4b, 04 marks)

Other Important Questions:

- Describe Network address Translation with a diagram. (WIN23 - Q1a, 03 marks)
- Create a simplified mental picture of the essential elements in an IPv4 datagram format. (WIN23 - Q1b, 04 marks)
- Identify if the following IPv4 addresses are valid or Invalid. If invalid, then write the reason for it. (1) 223.57.56.089 (2) 11100011.00001100.69.179 (3) 192.168.1.2.56 (WIN24 - Q1a, 03 marks)
- Describe security of IPv4 datagram. (WIN24 - Q2a, 03 marks)
- Convert the 192.168.1.1 IPv4 address into binary and hexadecimal representation. (S24 - Q1b-1, 02 marks)
- Convert the 11001100 10000001 00010001 00110011 binary IPv4 address into decimal and hexadecimal representation. (S24 - Q1b-2, 02 marks)
- Explain CIDR notation. (SUM25 - Q1e, 07 marks)
- List out different features of TCP. (SUM25 - Q4a, 03 marks)
- List out different features of SCTP services. (SUM25 - Q4a-OR, 03 marks)
- Write a short note on Services of UDP protocol. (SUM25 - Q4b-OR, 04 marks)
- The following is part of a TCP header dump in hexadecimal format. E293 0017 00000001 00000000 5002 07FF.. Find the (a) Sequence number (b) Acknowledgment number (c) Length of the header. (WIN23 - Q4a-OR, 03 marks)
- The following is part of a TCP header dump in hexadecimal format. 1000 0017 00000001 00000000 5002 07FF... Find the (a) Source port number (b) Destination port number (c) Sequence number (d) Acknowledgement number. (WIN24 - Q4b-OR, 04 marks)
- The hex dump of the SCTP header is as follows: 09C4138C00000020000000040. Find the (a) Source port number (b) Destination port number (c) Value of the verification tag (d) Value of the checksum. (S24 - Q4b-OR, 04 marks)
- Explain State transition diagram. (WIN23 - Q4c, 07 marks), (SUM25 - Q4c, 07 marks)
- Explain Significance of fields of SCTP packet format. (WIN23 - Q4c-OR, 07 marks), (SUM25 - Q4c-OR, 07 marks)
- Differentiate UDP and SCTP. (S24 - Q4a-OR, 03 marks), (WIN24 - Q4a-OR, 03 marks)
- Write any three differences between UDP and TCP. (S24 - Q4a, 03 marks)

- Write any three differences between UDP and SCTP. (S24 - Q4a-OR, 03 marks)
- Explain the TCP connection establishment and TCP Connection termination using a three-way handshake mechanism. (S24 - Q4c-OR, 05 marks)

Unit 2 - Next Generation IP

Repeated Questions:

1. **Draw and Explain IPv6 packet header format.**
 - **Appeared in:** WIN24 (Q2c, 07 marks), S24 (Q2c, 07 marks), SUM25 (Q2c, 07 marks)
2. **Write the difference between IPv4 and IPv6. / Compare IPv4 and IPv6.**
 - **Appeared in:** WIN24 (Q2a-OR, 03 marks), S24 (Q2b, 04 marks), WIN23 (Q2b, 04 marks)
3. **Shorten/Abbreviate the following IPv6 addresses and write the abbreviated colon hex notation.**
 - **Appeared in:** WIN24 (Q2b-OR, 04 marks), S24 (Q2a-OR, 03 marks)
4. **Decompress/Write the unabbreviated (Original) form of the following IPv6 addresses.**
 - **Appeared in:** WIN24 (Q2b, 04 marks), S24 (Q2a, 03 marks)
5. **Explain three strategies of transition from IPv4 to IPv6. / Outline the given strategy of transition from IPv4 to IPv6.**
 - **Appeared in:** S24 (Q2c-OR, 07 marks), WIN23 (Q2c-OR, 07 marks)
6. **What are the main differences between ICMPv4 and ICMPv6? / Difference between ICMPv4 and ICMPv6.**
 - **Appeared in:** WIN23 (Q2b, 04 marks), SUM25 (Q2i, 04 marks)

Other Important Questions:

- Explain the advantages of IPv6 when compared to IPv4. (S24 - Q2b-OR, 04 marks)
- Explain different extension headers of IPv6 packet. (WIN24 - Q2c-OR, 07 marks)
- Describe Packet format of IPv6 and explain Extension header. (WIN23 - Q2c, 07 marks), (SUM25 - Q2iii, 07 marks)
- Using CIDR notation, show the IPv6 address compatible to IPv4 address 129.6.12.34. (WIN23 - Q2a, 03 marks)
- Show abbreviations for the following addresses: a. 0000:FFFF:FFFF:0000:0000:0000:0000:0000 b. 1234:2346:3456:0000:0000:0000:0000:FFFF c. 0000:0001:0000:0000:0000:FFFF:1200:1000 (WIN23 - Q2a-OR, 03 marks)
- Explain need of IPv6. (SUM25 - Q2a, 03 marks)
- Discuss The IPv6 Stateless Address Auto-Configuration in detail. (SUM25 - Q2e, 07 marks)
- Discuss Transition from IPv4 to IPv6. (SUM25 - Q2g, 03 marks)
- Which types of errors are handled by the ICMP protocol? (SUM25 - Q2c, 04 marks)

Unit 3 - Unicast Routing

Repeated Questions:

1. **Explain Distance Vector Routing Algorithm. / Discuss Distance routing algorithm with example.**
 - **Appeared in:** WIN24 (Q3c, 07 marks), S24 (Q3c, 07 marks), WIN23 (Q3c, 07 marks)
2. **Explain Link State Routing Algorithm.**
 - **Appeared in:** WIN24 (Q3c-OR, 07 marks), S24 (Q3c-OR, 07 marks)
3. **Write the difference between intradomain and interdomain routing. / Describe Intradomain and Interdomain Routing. / What are the main distinctions between intra-domain and inter-domain routing?**
 - **Appeared in:** WIN24 (Q3a, 03 marks), S24 (Q3b, 04 marks), WIN23 (Q3b, 04 marks), SUM25 (Q3b, 03 marks)
4. **Compare RIP and BGP routing protocols (Any three points). / Write the difference between RIP and BGP routing protocols (any three points).**
 - **Appeared in:** WIN24 (Q3a-OR, 03 marks), S24 (Q3a-OR, 03 marks)

Other Important Questions:

- Define Autonomous System. List and explain types of autonomous system. (WIN24 - Q3b, 04 marks)
- List and explain four types of BGP messages. (WIN24 - Q3b-OR, 04 marks)
- Explain the following timers of the RIP: 1. The periodic timer 2. The expiration timer 3. The garbage collection timer. (S24 - Q3a, 03 marks)
- List out all the path attributes. Describe any two of them. (S24 - Q3b-OR, 04 marks)
- Write a short note on RIP. (WIN23 - Q3a, 03 marks)
- Classify Link state and path vector algorithm. (WIN23 - Q3a-OR, 03 marks)
- How does OSPF routing work? (WIN23 - Q3b-OR, 04 marks)
- Explain BGP version 4 in details. (WIN23 - Q3c-OR, 07 marks)
- Write a short note on Unicast routing. (SUM25 - Q3a, 03 marks)
- Discuss OSPF Protocol. (SUM25 - Q3c, 07 marks)
- Describe types of links. (SUM25 - Q3a-OR, 03 marks)
- How does the RIP work? (SUM25 - Q3b-OR, 04 marks)
- Explain Border Gateway Protocol. (SUM25 - Q3c-OR, 07 marks)

Unit 4 - Transport Layer Protocols

Repeated Questions:

1. **Differentiate UDP and TCP. / Identify difference between TCP and UDP. / Write any three differences between UDP and TCP.**
 - **Appeared in:** WIN24 (Q4a, 03 marks), WIN23 (Q4b, 04 marks), S24 (Q4a, 03 marks), SUM25 (Q4b, 04 marks)
2. **The following is a hex dump of a UDP header. Find the (a) Source port number (b) Destination port number (c) Total length (d) Length of the data.**
 - **Appeared in:** WIN23 (Q4a, 03 marks), WIN24 (Q4b, 04 marks), S24 (Q4b, 04 marks)
3. **Explain State transition diagram.**
 - **Appeared in:** WIN23 (Q4c, 07 marks), SUM25 (Q4c, 07 marks)
4. **Differentiate UDP and SCTP. / Write any three differences between UDP and SCTP.**
 - **Appeared in:** S24 (Q4a-OR, 03 marks), WIN24 (Q4a-OR, 03 marks)
5. **Explain Significance of fields of SCTP packet format.**
 - **Appeared in:** WIN23 (Q4c-OR, 07 marks), SUM25 (Q4c-OR, 07 marks)

Other Important Questions:

English:

- The following is part of a TCP header dump in hexadecimal format. Find the (a) Source port number (b) Destination port number (c) Sequence number (d) Acknowledgement number. (WIN24 - Q4b-OR, 04 marks)
- The following is part of a TCP header dump in hexadecimal format. Find the (a) Sequence number (b) Acknowledgment number (c) Length of the header. (WIN23 - Q4a-OR, 03 marks)
- The hex dump of the SCTP header is as follows. Find the (a) Source port number (b) Destination port number (c) Value of the verification tag (d) Value of the checksum. (S24 - Q4b-OR, 04 marks)
- Draw and Explain TCP segment header format. (S24 - Q4c, 05 marks)
- Explain the TCP connection establishment and TCP Connection termination using a three-way handshake mechanism. (S24 - Q4c-OR, 05 marks)
- List out different features of TCP. (SUM25 - Q4a, 03 marks)
- List out different features of SCTP services. (SUM25 - Q4a-OR, 03 marks)
- Write a short note on Services of UDP protocol. (SUM25 - Q4b-OR, 04 marks)
- List out different features of UDP. (WIN23 - Q4b-OR, 04 marks)

Unit 5 - Application Layer Protocols

Repeated Questions:

1. **Write the difference between POP3 and IMAP4 protocols. / Compare POP3 and IMAP4.**
 - **Appeared in:** WIN24 (Q5a, 03 marks), S24 (Q5a-OR, 03 marks), WIN23 (Q5b, 04 marks), SUM25 (Q5a, 03 marks)
2. **Explain File Transfer Protocol (FTP). / Demonstrate working of FTP protocol.**
 - **Appeared in:** S24 (Q5b-OR, 04 marks), WIN23 (Q5a, 03 marks)
3. **Explain Web-based mail. / Describe Web based mail.**
 - **Appeared in:** S24 (Q5b, 04 marks), WIN23 (Q5c-OR, 07 marks)
4. **Explain recursive domain name resolution with diagram.**
 - **Appeared in:** S24 (Q5c, 05 marks)

Other Important Questions:

- Write the difference between HTTP and DNS protocols. (WIN24 - Q5a-OR, 03 marks)
- Explain non-persistent connection of HTTP with example. (WIN24 - Q5b-OR, 04 marks)
- Explain iterative domain name resolution with diagram. (S24 - Q5c-OR, 05 marks)
- Explain Working of SMTP. (SUM25 - Q5b, 04 marks)
- List & Explain Application Layer Protocol in Computer Network. (SUM25 - Q5c, 07 marks)
- Explain W.B.M. (Web Based Mail) (SUM25 - Q5a-OR, 03 marks)
- Write a short note on IMAP. (SUM25 - Q5b-OR, 04 marks)
- Explain the architecture of Electronic mail. (SUM25 - Q5c-OR, 07 marks), (WIN23 - Q5c, 07 marks)
- Explain WWW and URL. (WIN23 - Q5a-OR, 03 marks)
- Outline DDNS and security of DNS. (WIN23 - Q5b-OR, 04 marks)
