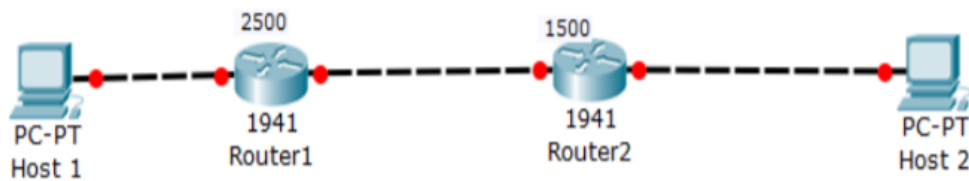# COMPUTER NETWORKS

Question Bank

Unit – 4
Network Layer and Internet Protocol

Sl. No	Question
1	Write down a forwarding table in router A, such that all traffic from H1 destined to host H3 is forwarded through interface 3, while all traffic from H2 destined to host H3 is forwarded through interface 4? (Hint: This is a trick question.) B A 1 3 2
2	Consider the router and the three attached subnets below (A, B and C). The number of hosts is also shown below. The subnets share the 24 high-order bits of the address space: 10.63.8.0/24

	Assign subnet addresses to each of the subnets (A, B, and C) so that the amount of address space assigned is minimal, and at the same time leaving the largest possible contiguous address space available for assignment if a new subnet were to be added. Then answer the questions below **Questions** 1. Is the address space public or private? 2. How many hosts can there be in this address space? 3. What is the subnet address of subnet A? (CIDR notation) 4. What is the broadcast address of subnet A? 5. What is the starting address of subnet A? 6. What is the ending address of subnet A? 7. What is the subnet address of subnet B? (CIDR notation) 8. What is the broadcast address of subnet B? 9. What is the starting address of subnet B? 10. What is the ending address of subnet B? 11. What is the subnet address of subnet C? (CIDR notation) 12. What is the broadcast address of subnet C? 13. What is the starting address of subnet C? 14. What is the ending address of subnet C?
3	What is the 32-bit binary equivalent of the IP address 202.3.14.25?
4	Consider sending a 1,600-byte datagram into a link that has an MTU of 500 bytes. Suppose the original datagram is stamped with the identification number 291. How many fragments are generated? What are the values in the various fields in the IP datagram(s) generated related to fragmentation?
5	An organization is granted the block 214.17.160.0/24. The administrator wants to create 8 subnets. a. Find the subnet mask. b. Find the number of addresses in each subnet. c. Find the last addresses in first subnet. d. Find the first addresses in last subnet.

6	Refer the topology given below.

2500   1500

PC-PT
Host 1

1941
Router1

1941
Router2

PC-PT
Host 2

Consider the transport layer segment with size of 4500 bytes, no option and IP header size of 20 bytes. Assume that a packet travels over a link with a MTU of 2500 bytes at router1.

i. Compute the fragmentation table and write in following format.

Fragment	Bytes			MF/Flag	Offset
	Total Bytes	Header Bytes	Data Bytes		
1					

ii. Assume these fragments reach a link with an MTU of 1500 bytes at Router2. Compute the fragmentation table.(In the same format mentioned above)

7	Show the unabbreviated colon hex notation for the following IPv6 addresses: a. An address with 64 0s followed by 64 1s. b. An address with 128 0s. c. An address with 128 1s. d. An address with 128 alternative 1s and 0s.

8	Decompress the following addresses and show the complete unabbreviated IPv6 address:
	    a. 1111::2222
	    b. ::
	    c. 0:1::
	    d. AAAA:A:AA::1234

9	Assume a host with Ethernet address $(F5\text{-}A9\text{-}23\text{-}11\text{-}9B\text{-}E2)_{16}$ has joined the network. What would be its global unicast address if the global unicast prefix of the organization is 3A21:1216:2165 and the subnet identifier is A245:1232.
10	What is the role of the forwarding table within a router?
11	When a large datagram is fragmented into multiple smaller datagrams, where are these smaller datagrams reassembled into a single larger datagram?

12	Suppose an application generates chunks of 40 bytes of data every 20 msec, and each chunk gets encapsulated in a TCP segment and then an IP datagram. What percentage of each datagram will be overhead, and what percentage will be application data?
13	Compare and contrast the IPv4 and the IPv6 header fields.
14	Consider a subnet with prefix 192.168.56.128/26. Give an example of one IP address (of form xxx.xxx.xxx.xxx) that can be assigned to this network. Suppose an ISP owns the block of addresses of the form 192.168.56.32/26. Suppose it wants to create four subnets from this block, with each block having the same number of IP addresses. What are the prefixes (of form a.b.c.d/x) for the four subnets?
15	What is meant by destination-based forwarding? How does this differ from generalized forwarding