Computer Networks Fall 2025

Assignment#4 (5A & 5C)

Due Date: Thursday, 23rd October, 2025

Submission Mode & Time: Handwritten solutions to be submitted during the lecture.

Please note the following:

1. No exceptions to the above date and time will be allowed. Inability to submit the assignment by the required time will result in zero marks.

2. To ensure self-completion of assignments and discourage plagiarism, the instructor or the relevant TA may randomly contact you and ask for an explanation of your answers. Where plagiarism and/or cheating is evident, you will be referred to the departmental disciplinary committee. In extreme cases of plagiarism an F may be awarded immediately with further referral to the university disciplinary committee.

3. All solutions must be **hand-written.**

4. **Assignment Solution Submission**: In case of **in person / physical lectures at the campus**, hard copy of the hand-written assignment's solutions will be submitted by **hand** by each student to the Instructor / TA directly during the lecture on the due date.

PART-1

Use the following text for completion of this part of the assignment:
Computer Networking - A Top-Down Approach 8th Edition by Kurose & Ross.

Solve the following problems from the back of **Chapter 4**. Every Question has equal marks i.e.

Review Questions: **(3*2 = 6 marks)** **[CLO 3]**

R18, R19

Problems: **(3*4 = 12 marks)** **[CLO 3]**

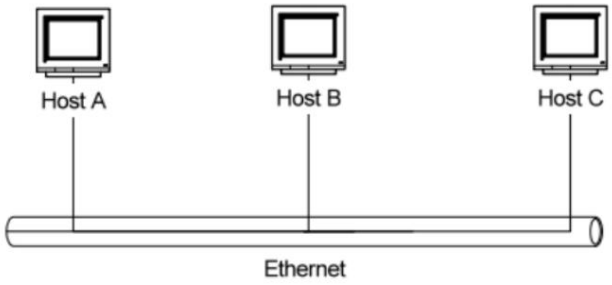
P8, P9, P11, P21

PART - 2

Question: 01 [2 * 5 = 10 Marks] [CLO 3]

Problem 1. Consider an Ethernet network with three hosts, Host A, Host B, and Host C as shown in Figure 1. No machine is configured as an IP router, and there is no IP router on this network. Assume that the IP addresses and subnet masks are as shown in the figure.

IP Adress:	192.0.3.88	192.0.3.94	192.0.3.200
Subnet Mask:	255.255.255.0	255.255.255.240	255.255.255.240



For each of the following IP datagram transmissions, describe if the transmissions will be successful. If a transmission will not work, provide an explanation:

1. Host C sends an IP datagram to Host A
2. Host A sends an IP datagram to Host B
3. Host A sends an IP datagram to Host C
4. Host B sends an IP datagram to Host A
5. Host B sends an IP datagram to Host C

Question: 02 [2 * 3 = 6 Marks] [CLO 3]

Consider the 128.100.112.0/21 block of IP addresses. This block of addresses must be divided into four subnetworks that each have at least 500 IP addresses.

1. Give the subnet mask of the four new subnetworks.
2. Specify the network address and the network prefix for each subnetwork.
3. Specify the broadcast IP address for each subnetwork.

Question: 03 [5 Marks] [CLO 3]

Select a subnet mask for 10.0.0.0/8 so that there will be at least 16,000 subnets with at least 700 hosts addressed on each subnet.

Question: 04 [15 Marks] [CLO 3]

A certain organization has been assigned a network address block 201.180.128.0/23. It has been determined that the organization needs:

- 1 network with at least 240 hosts
- 1 network with at least 55 hosts
- 1 network with at least 28 hosts
- 2 networks with at least 15 hosts

Note: When subnetting, remember that the number of hosts specified doesn't include the network address and the broadcast address. Be sure to account for these addresses in your calculations for accurate subnetting.

Design the complete IP addressing scheme for this organization and fill in the table below.
Show all your work with appropriate comments (if any):

Network	**Network Address**	**Subnet mask**	**First available host address**	**Last available host address**	**# of available host addresses**
Network 1					
Network 2					
Network 3					
Network 4					
Network 5					