INTERNATIONAL ISLAMIC UNIVERSITY, ISLAMABAD
FACULTY OF BASIC & APPLIED SCIENCES
DEPARTMENT OF COMPUTER SCIENCE & SOFTWARE ENGINEERING

Mid Term Examination FALL Semester 2021

Course Title:	**CS374 Computer Networks**	**Batch:**	**BSSE F19 & BSIT F19**
Course Instructor:	Dr. Qaisar Javaid	**Date:**	November 8th, 2021
Total Marks:	40	**Max Time Allowed:**	2:30pm till 4:00pm (90 minutes)

Instructions:

- ✓ There are **3** questions. Attempt **ALL** of them.
- ✓ The marks for each question are written in brackets [ ]
- ✓ Answer should be prescribed.
- ✓ The invigilator present is not supposed to answer any questions. If you have any queries, write down your assumption and continue.

Question 1: (2.5 × 4 = 10 points)

For each of the following four networks, discuss the consequences if a connection fails.

a. Five devices arranged in a mesh topology.
b. Five devices arranged in a start topology (not counting the hub).
c. Five devices arranged in a bus topology.
d. Five devices arranged in a ring topology.

Question # 2 (6 + 6 + 3 = 15 points)

a. Suppose a computer sends a packet at the transport layer to another computer somewhere in the Internet. There is no process with the destination port address running at the destination computer. What will happen?
b. An Ethernet MAC sublayer receives 1510 bytes of data from the upper layer. Can the data be encapsulated in one frame? If not, how many frames need to be sent? What is the size of the data in each frame?
c. Explain different type of twisted pair cable.

Question 3: (5 × 3 = 15 points)

a. An ISP is granted a block of addresses starting with 120.60.4.0/22. The ISP wants to distribute these blocks to 100 organizations with each organization receiving just eight addresses. Design the subblocks and give the slash notation for each subblock. Find out how many addresses are still available after these allocations.
b. Given the IP address 10.5.118.3 and the mask 255.255.255.0, what are all the subnet numbers if the same (static) mask is used for all subnets in this network?
c. You design a network for DCS who wants the same subnet mask on every subnet. The DCS will use network 10.0.0.0 and needs 200 subnets, each with 200 hosts maximum. What subnet mask would you use to allow the most growth in subnets? Which mask would work and would allow for the most growth in the number of hosts per subnet?