Habib University

Course Title:

Instructors: Dr. Tariq Mumtaz, Dr. Farhan Khan

Assignment No. 01

Release Date: Sep 2nd, 2024 **Due by:** September 11th, 2024 (5pm)

Total points: 100 **Points obtained:**

Student Name:	Student ID:	Section:

Purpose:

The purpose of this assignment is to help you apply the concepts of data communication modes, network models, protocol layering, and network types.

Instructions:

1. This assignment should be done individually.
2. All questions should be answered in **black ink only**. (Extra sheets can be used)
3. Scan your answer sheet and upload it on LMS before the due date.

Grading Criteria:

1. Your assignments will be checked by instructor/TA.
2. You can also be asked to give a viva where you will be judged whether you understood the question yourself or not. If you are unable to correctly answer the question you have attempted right, you may lose your marks.
3. Zero will be given if the assignment is found to be plagiarized.
4. Untidy work will result in a reduction of your points.

Late submission penalty:

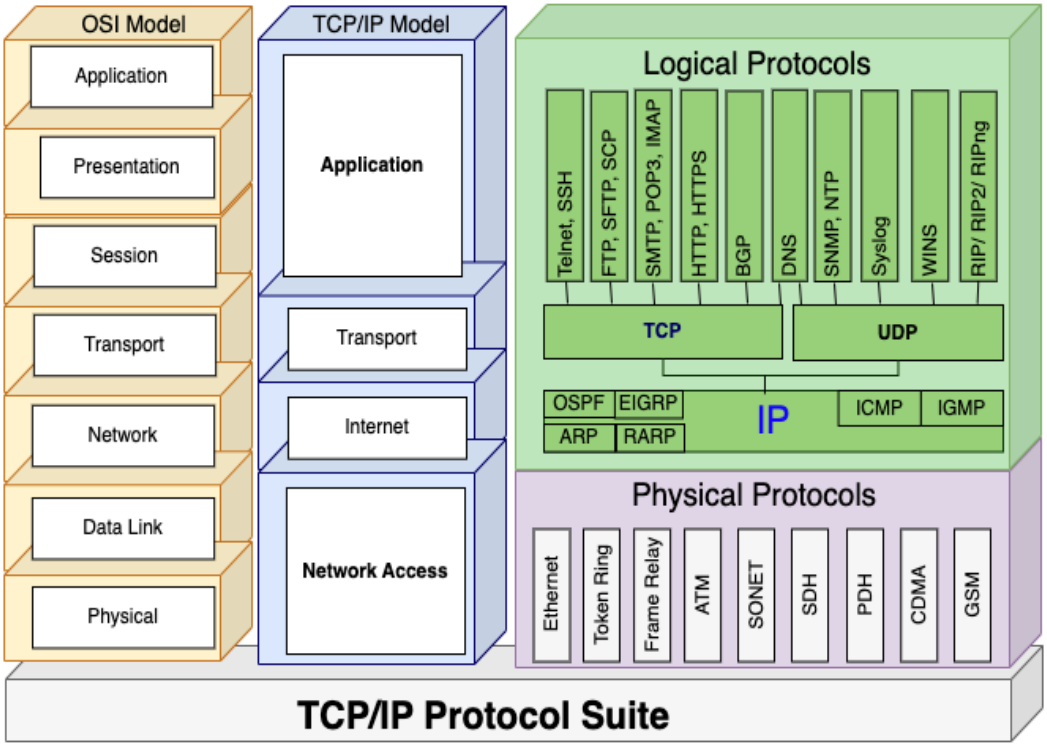
- 1-day late submission – 4% deduction of the maximum allowable marks
- 2-days late submission – 8% deduction of the maximum allowable marks
- No submission will be accepted after one week of the original deadline

CLO Assessment:

This assignment assesses students for the following course learning outcomes.

Course Learning Outcomes		CLO Assessed
CLO 1	To compare and classify different data signals, physical transmission medium, topologies, error and flow control at the data link layer of the computer networks.	✓
CLO 2	To orient different functionalities, protocols stacks and architecture of the Network, Transport and Application layers of data network models.	
CLO 3	To investigate different network-functionalities (e.g. security, computing, virtualization etc.), and relate it with the state-of-the-art research scenarios, for instance, Software Defined Networks (SDN) and Internet of Things (IoT).	

P#	Questions	Pts
1	Most data communication in a computer network uses serial transfer as compared to parallel transfer of data which is used in computer peripherals. Can you find out and explain the reason why serial communication is the preferred mode of data transfer in networking devices?	10
2	In our class, we've focused on layered network models specifically within computer networks. However, layered models are also utilized in various other applications. Your task is to investigate another communication system that employs a layer architecture. Discuss the reasoning behind the number of layers in the system you choose. Additionally, provide a brief overview of the functionality of each layer and compare it to the functionalities of the TCP/IP layers.	20
3	The presentation of data is becoming more and more important in today's Internet. Some people argue that the TCP/IP protocol suite needs to add a new layer to take care of the presentation of data. If this new layer is added in the future, where should its position be in the suite? Redraw Figure 1.17 to include this layer. Also, describe duties and responsibilities of the newly designed presentation layer. How will the new presentation layer communicate with lower and upper layers?	20
4	In addition to the basic topologies discussed in class, there is a concept of the use of a hybrid topology in practical computer networks, both campus as well as enterprise networks. • Search one practical example of a hybrid topology. Draw its diagram and discuss its advantages and disadvantages in detail. • Using your proposed hybrid topology, discuss how it can be used in an enterprise network to house FIVE different functional departments of an organization.	2x10 =20
5	The following diagram shows the most popular protocols used in each layer of the TCP/IP model: You job is to choose one protocol from each layer of the TCP/IP model and briefly describe functionality of ach of the chosen protocols within 100 words. (Note: The Network Access Layer is a combination of Data Link Layer and Physical Layer in a 4-layer model used in some books of networking. You should choose one protocol from that layer)	5x4= 20

		
6	Internet access is normally provided in different parts of the world through a number of International ISPs (Internet Service Providers), Regional ISPs, and National ISPs. • Your task is to find out the most popular ISP in each of the above category. • Find out the Flagship product/service offered by each of the ISP for high-speed Internet access.	5x2= 10