International Islamic University Chittagong (IIUC)

Department of Electronic and Telecommunication Engineering

Final Examination, Autumn 2022

Program: **B.Sc (Engg.)**
Course Code: **ETE-4749**
Time: **2 hour 30 minutes**

Semester: **Autumn 2022**
Course Title: **Computer Networks**
Full Marks: **50**

ILO / CO: 4 Enumerate the layers of the OSI model and TCP/IP. Explain the functions of each layer.
ILO / CO: 5 Identify the different types of network devices and their functions within a network
ILO / CO: 6 Understand and building the skills of subnetting and routing mechanisms.
ILO / CO: 7 Familiarity with the basic protocols of computer networks, and how they can be used to assist in network design and implementation.

Bloom's Taxonomy: Remember-**R**, Understand-**U**, Apply-**Ap**, Analyze-**An**, Evaluate-**E**, Create-**C**.

Part A

1.	(a)	What is classful addressing? Explain different class of IP addresses with necessary figure.	**CLO6**	**U**	**5**
	(b)	A classless address is given as **167.199.170.91/27**. I. Find the number of addresses in the block. II. Find the first address. III. Find the last address.	**CLO6**	**Ap**	**5**
2.	(a)	An organization is granted a block of addresses with the beginning address 14.24.74.0/24. The organization needs to have 3 subblocks of addresses to use in its three subnets: one subblock of 10 addresses, one subblock of 60 addresses, and one subblock of 120 addresses. Design the subblocks. Also, represent the resulted design using figure.	**CLO1 /CLO 2**	**An /E**	**5**
	(b)	Explain the following strategies(with all necessary figures) for the transition from IPv4 to IPv6: i) Dual Stack ii) Tunneling iii) Header Translation	**CLO2**	**E**	**5**
		OR			
2.	(a)	Describe the functions of Data Link Layer	**CLO4**	**U**	**5**
	(b)	State the differences between the OSI and TCP/IP model.	**CLO4**	**An**	**5**
		Part B			
3.	(a)	Write some features of IPv6.	**CLO3**	**U**	**4**
	(b)	IPv6packet is composed of a base header followedby the payload. The base header occupies 40 bytes. Explain how these 40 bytes are distributed.	**CLO3**	**U/ An**	**6**

4.	(a)	The following is the content of a UDP header in hexadecimal format.**CB84000D001C001C** **I.** What is the source port number? **II.** What is the destination port number? **III.** What is the total length of the user datagram? **IV.** What is the length of the data? **V.** Is the packet directed from a client to a server or vice versa? **VI.** What is the client process?	**CLO5**	**Ap**	5
	(b)	Suppose a TCP connection is transferring a file of 10000 bytes. The first byte is numbered 10001. What are the sequence numbers for each segment if data are sent in five segments, each carrying1000 bytes?	**CLO5**	**Ap**	5
5.	(a)	Explain four identifiers to define a web page.	**CLO5**	**Ap**	5
	(b)	What is File Transfer Protocol (FTP) and how does it work? Explain with necessary figure.	**CLO5**	**Ap**	5
		OR			
5.	(a)	What is NAT? Explain how NAT works with detailed figure.	CLO1/ CLO2	**Un /E**	5
	(b)	Suppose a TCP connection is transferring a file of 5000 bytes. The first byte is numbered 10001. What are the sequence numbers for each segment if data are sent in five segments, each carrying 1000 bytes?	CLO2	**E**	5