

# MIDTERM TEST - 2025

Course: **CS 4445 – Data Communication and Networking**

Date: \_\_\_\_\_ Duration: 90 minutes

Total of pages: \_\_\_\_\_ Total marks: 100

Student name: .....

Student's ID: .....

**Each question 1-10 gets 5 points and each question 11-15 gets 10 points.**

1. What is 255<sub>D</sub> in Binary and in Hex; Convert 11101101<sub>B</sub> into Decimal.
2. What are five layers in the Internet protocol stack? Which layers are used for switches and Which layers are used for routers?
3. Why are standards important for protocols? Name 05 protocols you know.
4. Why does the pipelining solution increase utilization? (sketch diagram/s and do calculation).
5. What are benefits of Bit Torrent?
6. What are cookies? And what are cookies used for?
7. What do you understand about demultiplexing? And what does a receiver use to connection-oriented demultiplex?
8. Consider a TCP connection between Host A and Host B. Suppose that the TCP segments traveling from Host A to Host B have source port number x and destination port number y. What are the source and destination port numbers for the segments traveling from Host B to Host A?
9. In our *rdt* protocols, why did we need to introduce sequence numbers?
10. We made a distinction between the forwarding function and the routing function performed in the network layer. What are the key differences between routing and forwarding?
11. Make contrast between Go-Back-N (GBN) and Selective Repeat (SR) in reliable data transfer protocols
12. Suppose that there is a routing table with the following entries:  
192.168.1.0/24  
192.168.0.0/16  
192.168.1.128/25  
and the distance IP address: 192.168.1.130.  
What is the routing principle? Apply it and choose entry?
13. List advantages and disadvantages of TCP. Which services use TCP? Give an example in car traffic like TCP connection.
14. In the UDP segment there is a checksum. Suppose that we have the following three 16-bit words:  
Word 1: 0001001000110100  
Word 2: 0101011001111000  
Word 3: 1001101010111100  
Please, calculate the checksum of the UDP segment.
15. Supposing a datagram has 5000 bytes, MTU = 2020 bytes and 20-byte header. When doing IP fragmentations, one large datagram becomes several smaller datagrams – fragments.

	length =5000	ID =x	fragflag =0	offset =0	
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How many fragments do we need? Fill parameters in each fragment?