CSCI 466 Homework 2

Due Friday October 28th at 11:59 PM

Please submit your **typed** answers as a PDF to the correct D2L dropbox

Problem 1. What is multiplexing and demultiplexing in the transport layer?

Problem 2. What are the advantages and disadvantages of using UDP instead of TCP?

Problem 3. What does the TCP protocol do prevent itself from overwhelming or overfilling a TCP receiving buffer?

Problem 4. We discussed several important mechanisms that are implemented in the transport layer to guarantee reliable data transfer. For each of the mechanisms listed below, give a definition and the purpose for the mechanism and what it is used for.

Mechanism	**Definition and Purpose**
Acknowledgements	
Negative Acknowledgements	
Checksum	
Timer	
Sequence number	
Window/Pipelining	

Problem 5. What is the TCP handshake and what are the three steps that occur?

Problem 6. Consider the following IPv4 subnet: 149.162.7.0/24

(a) Provide a valid IP address that falls within this subnet

(b) How many bits make up the network bits of an IP address in this subnet?

(c) How many bits make up the host bits of an IP address in this subnet?

(d) How many addresses are available in this subnet?

Problem 7. Consider the forwarding table that uses longest prefix matching to make forwarding decisions.

Prefix	Output Link
10000111 01010101 00011*** ********	1
10000111 01010101 000110** ********	2
10000111 01111111 00011*** ********	3
10000111 01010101 00011100 ********	4
Otherwise	5

Listed below are IP addresses that go through this router. For each address listed below, state which output link will be used.

(a) 10000111 01111111 00011000 11110010

(b) 10000111 01010101 00011100 11111010

(c) 10000111 01010101 00011011 00000001

(d) 10000111 01010101 00011111 00000001

(e) 224.92.18.43

Problem 8. What is DHCP? What is it used for? If a new device enters a network and needs a new IP address, what are steps for getting it assigned a new IP address?