# CS 462: Assignment 4

Section A: Transport Layer

1. Write 2 differences between the Flow Control and Congestion Control Service offered by the TCP in Transport layer.   2

2. There are two broad categories of congestion control services that can be offered by the internet. State the basic difference between them and provide one example for each.   2

3. In about 5-6 sentences with formula if applicable, explain the AIMD process of congestion control for a single flow.   2

4. Explain TCP Reno in about 4-5 sentences.   2

5. What is the drawback of TCP Tahoe? Which protocol solves this issue and how?   2

Section B: Network Layer

6. Explain the concept of tunneling in Network Layer.   2

7. With a packet diagram, explain IP Fragmentation of a packet of size 5200 bytes if the MTU is only 1300 bytes long. Note that the IP header for each packet is 20 bytes long. Each packet should include length, ID, fragflag and offset.   3

8. Explain the IPv6 datagram and mention any four differences that you can observe between its IPv4 counterpart.   2

9. Write three features of RIP in network layer.   2

10. Name and explain the functionality of different routers in Hierarchical OSPF   2

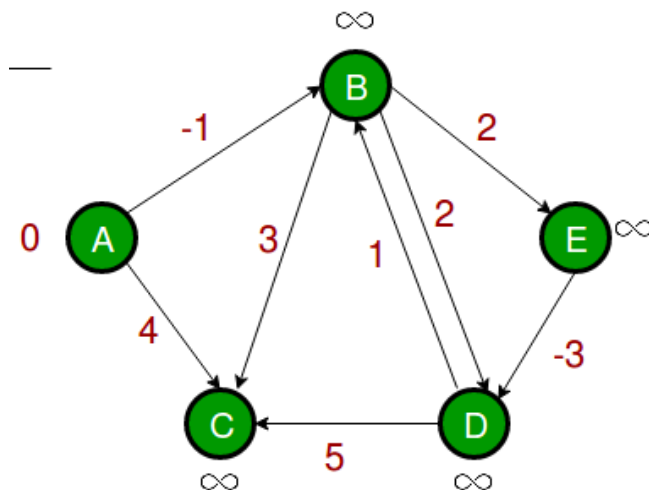11. Perform Dijkstra's Algorithm on the following undirected graph to find the single shortest path: 3
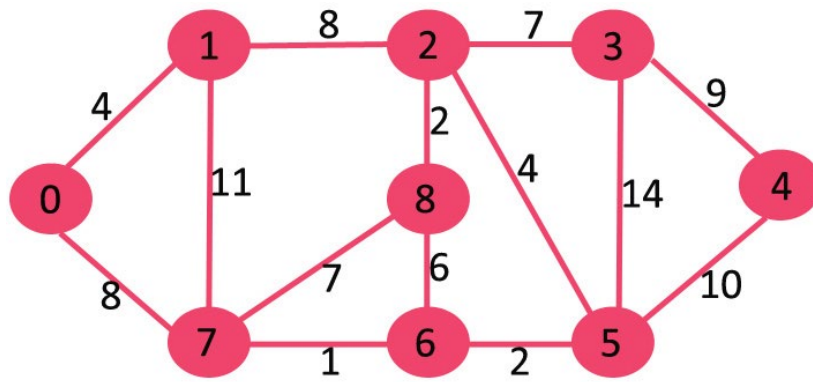
Fill the following table:

Nodes	1	2	3	4	5	6	7	8

12. Perform Bellman-Ford's Algorithm on the following directed graph to find the single shortest path: 3

30 points

Fill the following tables:

Edges	A-B	A-C	B-C	B-D	B-E	D-B	D-C	E-D
Iter 1								
Iter 2								
Iter 3								
Iter 4								
Iter 5								

Nodes	A	B	C	D	E
Iter 1					
Iter 2					
Iter 3					
Iter 4					
Iter 5					

13. Solve using Dijkstra's the following network to find the shortest path from Node 1 to all nodes in the directed graph. Show the table and shortest path diagram.   3

30 points