Test #2

CSCI-3400 - Fall-2022

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**Instruction: Write clearly and give full justification to each question. Show all your MATHEMAICAL working. This is an open book and lecture notes exam.**

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**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**E#:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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| --- | --- | --- |
| Questions | Max Points | Earned Points |
| 1 | 10 |  |
| 2 | 10 |  |
| 3 | 10 |  |
| 4 | 10 |  |
| 5 | 10 |  |
| 6 | 10 |  |
| 7 | 10 |  |
| 8 | 10 |  |
| 9 | 10 |  |
| 10 | 10 |  |
| Total | **100** |  |

**IMPORTANT**

* You can use online references, but **write answers in your own words**!  **Cite any references used**. Answer the question in your own words, no credit will be given for answers copied from any source*.*
* No collaborating with other people; a **0** will be given if any collaboration evidence is found.
* I am looking for very specific, detailed, correct, and complete answers.
* Most answers found on the Internet (especially Wikipedia) are generic answers for people without any networking background and are not any of the above! Research each problem completely.
* Turn in a Word document or pdf into the Dropbox.

1. What is a network service model; discuss each of the services from network performance point-of-view.
2. Answer the following questions:

1. What is congestion control?
2. How it can affect the network communication?
3. Explain the overall functionality of Network Layer and discuss two main functions of network- layer?
4. Explain in detail the concept of NAT, and how it plays a role in cyber security.
5. Explain the concept of Pipelining, and how it increased the network utilization.
6. Explain the concept of RTT in TPC/IP, and how it can affect the performance of a computer network.
7. Suppose that TCP's current estimated values for the round trip time (estimatedRTT) and deviation in the RTT (DevRTT) are 250 msec and 15 msec, respectively. Suppose that the next three measured values of the RTT are 280, 260, and 300 respectively.

Compute TCP's new value of estimatedRTT, DevRTT, and the TCP timeout value after each of these three measured RTT values is obtained.Use the values of α = 0.125 and β = 0.25.

1. Explain in detail, how the concept CWND works to prevent network congestion.

1. Explain in detail, what is the difference between FORWARDING and ROUTING?
2. Explain in detail how TCP Tahoe and TCP Reno works. Also explains how TCP Reno is consider as an improvement over TCP Tahoe.