

Second Third-Term Exam

*Closed book and notes; In class**Thursday, November 13th*

- ⊕ *Do not forget to write your name on the first page. Initial each subsequent page.*
- ⊕ *Be **neat and precise**. I will not grade answers I cannot read.*
- ⊕ *You should draw simple figures if you think it will make your answers clearer.*
- ⊕ *Good luck and remember, brevity is the soul of wit*

- All problems are mandatory
- I cannot stress this point enough: **Be precise**. If you have written something incorrect along with the correct answer, you should **not** expect to get all the points. I will grade based upon what you **wrote**, not what you **meant**.
- Maximum possible points: 50.

Name: _____

Problem	Points
1	
2	
3	
4	
5	
Total	

1. Congestion Control, Address Translation

(a) What is *slow start*? (2 points)

(b) Can more than 64K TCP connections be supported through a single NAT? Precisely explain when this is and is not possible. (3 points)

(c) Upon detection of loss, how is the TCP congestion window adjusted with and without *fast recovery* implemented. (5 points)

4. Application-layer Protocols

(a) `ftp` using a single control connection and multiple data connections. State one advantage and one disadvantage of this scheme. (2 points)

(b) HTTP/1.0 is often considered inefficient. Why? (3 points)

(c) Early `netscape` browsers tried to solve the problems of HTTP/1.0 by opening multiple simultaneous connections. Why is this a good or bad idea? (5 points)

5. Application-layer Protocols (2)

- Describe a method by which arbitrary binary data can be transported through mail gateways that can only handle 7-bit ASCII characters. (3 points)

- Outline the method by which news is propagated using NNTP. (3 points)

- In your project, the TTP sends a `inventory` message after a successful transaction that changes the inventory of the specified party (say A). What signatures/ hashes must this message include and why? (4 points)