

First Third-Term Exam

*Closed book and notes; In class**Thursday, March 4th*

- ⊕ *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. Nomenclature

(a) Describe the following terms: (2 points each)

- Latency

- Subnet

- Poisoned Reverse

- ARP

- BGP Speaker

2. LS and DV Routing

- (a) Precisely how are sequence numbers used in Link State routing? (3 points)

 - (b) What is the run-time complexity and storage requirement of Dijkstra's algorithm? What data structures do you need to achieve these bounds? Make sure you define your terms and variables (3 points)
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- (c) Why (if at all) are periodic updates required by Distance Vector routing? Explain with an example. (4 points)

3. IP Service Model, Addressing, ARP

- (a) How did the IP forwarding procedure change, both at hosts and at routers, due to the addition of subnets? (4 points)
- (b) Suppose you've been allocated 128.8.128.0/20, and you split your addresses into four equal size subnets. Give the subnet and broadcast addresses (also known as subnet ID or subnet number) corresponding to your subnets. (2 points)
- (c) Describe how ARP can be used to bridge two different ethernet segments to form a single IP subnet. Assume "host" B has interfaces B_0 and B_1 on the two segments respectively. The upstream router R is on the segment with interface B_0 . (4 points)

4. CIDR, BGP

- (a) How are the “Next Hop” and “AS Path” attributes used in BGP? (2 points)

- (b) Describe one reason a route reflector might be used. (1 points)

- (c) What is the difference between an IGP and iBGP? (2 points)
- (d) Suppose ISP A is offered a route for its own customer C by the customer and by its provider P. How should A prioritize these routes? (2 points)

- (e) Describe with an example how the scenario in the previous problem can occur, and why customer C might want such a configuration. (3 points)

Multicast, Assignment

5. (a) Why can't reverse path broadcast be used for reliable flooding in Link State routing? (2 points)
- (b) In PIM, why and to whom would a RP send a (S,G) join message? (2 points)
- (c) What is a parent router in DVMRP? (2 points)
- (d) What are the advantages (or disadvantages) of a multi-threaded server over a server that forks a process for each new connection?