

First Third-Term Exam (Alt.)

Closed book and notes

Wednesday, Oct. 2nd

- ⊕ 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 + bonus.

Name: _____

Problem	Points
1	
2	
3	
4	
5	
Total	

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	2	4	8	16	32	64	128	256	512	1024	2048	4096	8192	16384	32768	65536

1. Nomenclature

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

- CIDR

- Internet

- Stub AS

- Default-Free Router

- Subnet Mask

2. Routing

- [illegible]

3. Internet Protocol

(a) Why were subnets introduced? (2 points)

(b) Suppose you are allocated the prefix 123.234.5.128/27. Divide your allocation into four equal sized subnets. For each subnet, list the following: (3 points)

	Subnet-id	Mask	Broadcast	# hosts	Highest Address	Lowest Address
Subnet 0						
Subnet 1						
Subnet 2						
Subnet 3						

(c) Suppose you need fragment a IP datagram (ID set to 42) with 1080 payload bytes to be transmitted over a link that can transmit a 276 bytes IP datagram maximum (i.e., IP header and payload, but not the link header which you can ignore). Fill in the values below assuming maximum sized fragments. Assume no datagrams contain IP options. (3 points)

IP ID	Offset	MF	DF	Total Length

(d) IP reassembly code receives a datagram with previously unseen Identification=42417, Total Len **1023** bytes, MF flag=1, and offset=**8093**. How should this datagram be processed. (3 points)

4. CIDR, BGP

- (a) What is the difference between a *transit* and *stub AS*? (2 points)

- (b) What is a BGP Speaker? Is an AS required to have BGP Speaker(s), and if so how many? (2 points)

- (c) Provider *P* has four customers with allocations 112.8.32/28, 112.8.33/28, 112.8.34/28, and 112.8.35/29. What CIDR prefix should *P* advertise. (3 points)

- (d) Suppose a multi-homed AS (named M) has two upstream providers, A and B. How can M's administrator configure the BGP protocol/advertisements such that packets always exit M via B and always come in to M via A? (3 points)

5. Mobile IP, Implementation

- [illegible]