

Final Exam

*Open book and notes; In class**Thursday, December 16th*

- ⊕ *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. IP, Multicast

- (a) Give a simple example where CIDR prefixes are aggregated *two* levels. Describe your example with IP addresses that match at each level. (3 points)

- (b) Why is pruning necessary for DVMRP?(2 points)

- (c) Why are IP addresses suited for global routing (as opposed to, say, MAC addresses)? (5 points)

2. TCP/Implementation

- (c) Describe how the `select` (or `poll`) call can be used to multiplex between different TCP connections. (5 points)

3. Application-layer Protocols, Sockets

- [illegible]

4. MAC Layer protocols/Error Correction

- (c) Consider the CRC generator polynomial $x^4 + 1$. What properties does it have and why? (4 points)

5. Design

Consider file-swapping programs such as Kazaa or Gnutella (to be used only for explicitly legal purposes, such as scalably distributing research papers!). These systems often construct a two layer hierarchy in which some peers are promoted to be “supernodes”. Peers are either a supernode, or connected to a supernode. Supernodes index content that is available at peers connected to them. Queries not satisfied at a supernode are resolved using some supernode-supernode protocol.

(a) How would you choose a peer to be a supernode? Critique your choice. (5 points)

(b) Suppose Chord is used as the supernode-supernode protocol. Discuss the merits and demerits of such a choice. (5 points)