

CPSC 156 Exam  
March 1, 2007

Answer all parts of all six questions. Each question is worth 16 points, for a total of 96; everyone gets 4 points for free. You do not have to justify your answers to True/False questions.

Please remember to write your name, CPSC 156, and today's date on the covers of all blue books you submit.

Question 1

- (a) (8 points) The original Internet-protocol design philosophy consisted of an ordered set of eight goals. For two points each, list four of these eight goals.
- (b) (6 points) When a new machine is attached to a network, it must be told the IP addresses of three machines if it is to be able to communicate with the rest of the Internet. For two points each, identify these three machines whose IP addresses are needed.
- (c) (2 points) Recall that Clark and Blumenthal discuss the tension that has arisen because various stakeholder groups in today's highly commercialized, mass-market Internet have stringent demands that were not envisioned when the Internet was originally conceived and designed. For one point each, identify two such demands and the stakeholder groups that have voiced them.

Question 2

- (a) (6 points) What is *fair use* of a copyright work, and what are the four factors that must be considered in order to determine whether a particular use is fair?
- (b) (6 points) For two points each, give three reasons that digital works and Internet-based distribution are not as well addressed by US copyright law as works in traditional media such as books and CDs.
- (c) (4 points) Briefly summarize Steve Jobs's explanations of why the iTunes music-distribution system has thus far included digital rights management (DRM) and why iTunes and the rest of the online-music business may benefit from doing away with DRM.

Question 3

- (a) (4 points) Define the term *disintermediation* as it was used in our discussion of B2C e-commerce.
- (b) (4 points) Define the term *reintermediation* as it was used in our discussion of B2C e-commerce.
- (c) (4 points) What is *multichannel retailing*, and why is it often more effective than pure-play e-tailing?
- (d) (4 points) Why are auctions a natural way in which to conduct C2C e-commerce?

#### Question 4

- (a) (4 points) What are the two principal types of analysis of the web that search companies perform in order to be able to answer queries?
- (b) (6 points) Two important components of the Google web-searching platform are the *crawler* and the *PageRank algorithm*. For three points each, briefly explain the function performed by each of these components.
- (c) (4 points) Varian points out that books can be divided into “out-of-copyright,” “in-copyright and in-print,” and “in-copyright and out-of-print.” Which of these categories contains most of the books in libraries? Is this point relevant to the question of whether Google’s proposed project is fair use and, if so, why? (Just give a yes or no answer and a one- or two-sentence justification.)
- (d) (2 points) Lichtman claims that “security is an issue” in the Google Books project. What is the security threat that he has identified?

#### Question 5

- (a) (8 points) Define the terms *network effects*, *lock-in*, and *switching costs*, and explain briefly why network effects often lead to strong lock-in and high switching costs.
- (b) (4 points) Why have network effects created stronger lock-in to eBay than they did to some of the other Internet products and services we have discussed in class (*e.g.*, Netscape)?
- (c) (4 points) Briefly explain one way that a company can profit from providing a free information product to users; give an example of such a product and the company that provides it.

#### Question 6

- (a) (4 points) For one point each, match the item in the left-hand column with the item in the right-hand column that is most closely associated with it.

Physical Layer	Routing
IP Layer	Email
Transport Layer	Ethernet
Application Layer	Congestion control

- (b) (4 points) Write an HTML fragment that creates three boxes labeled “blue,” “red,” and “yellow,” of which the user may check any subset.
- (c) (4 points) Briefly explain how a cookie stored on your computer while you are using one website can result in another website’s receiving personal information about you.

(d) (4 points) For one point each, answer True or False for each of 1-4.

1. When you download a webpage, all of its constituent packets must follow the same route from the server to your machine.
2. If your machine is part of the yale.edu domain, then it must send a query to a DNS server every time you visit a website not hosted by Yale.
3. If a packet is routed along a faulty path and cannot reach its destination, its TTL (“time-to-live”) IP-header field can be used to prevent it from looping forever.
4. The assignment of domain names and IP addresses is managed in a decentralized fashion.