

Answer questions directly on this document. Question point values are shown in parentheses.

1. (12) Consider the following excerpt taken from “It’s a Wired World” published in the September 97 issue of CFO Magazine.

Boise Cascade Office Products (www.bcop.com), of Itasca, Illinois, a \$2.7 billion-a-year business with 42 distribution centers in the United States plus several others overseas, recently deployed an extranet that is already helping about 600 large corporate customers make purchases. That number is growing by about 100 users per month; by the end of the year, it will be used by 5 percent of Boise Cascade's accounts.

The extranet, which Boise Cascade calls Internet '97, is based on Web server products from Actra (a joint venture between Netscape and GE Information Services) and Boise Cascade's existing Oracle database. Customer satisfaction is a primary goal of the system, but so is reduced cost. “What we are trying to do is move more customers into more sophisticated forms of E-commerce to make them happier,” says Laurie Beeson, vice president of marketing at Boise. “One way we keep them happy on pricing is by continually reducing our operating costs, which allows us to give direct reductions in prices.”

In 1996, Boise Cascade spent \$27 million for inbound call service--not including the cost of the operators. “When we take an order via our call center, it costs us about 86 cents a line, but when we take the order electronically it can drop to 41 cents a line,” Beeson says. The electronic systems also allow Boise Cascade to customize price lists and ordering procedures to suit individual accounts, she adds. “Every item is priced differently for every customer.”

- a. What is an “extranet”?
 - b. Identify something from the excerpt that demonstrates the concept of efficiency. Justify your choice (use one sentence only).
 - c. Identify something from the excerpt that demonstrates the concept of effectiveness. Justify your choice (use one sentence only).
2. (8) When you use the Microsoft Access database management system, you must specify the type of each field in your database. Two choices for storing whole numbers are Integer (2 bytes) and Long Integer (4 bytes). Two choices for storing non-integer numbers are Single (4 bytes) and Double (8 bytes).

Given just this information, compare and contrast these four types with respect to magnitude and precision. Your discussion should address general factors—not precise details (such as type X has a maximum size of 32,767).

3. (8) Why does the number of colors you want to represent in an image impact the size of the file used to store the image?
4. (10) What is TCP/IP and why is it important?

5. (12) With regard to databases, is there any difference between the data redundancy problem and the data integration problem? Explain.
6. (10) Assume that you work for a company that offers page layout services for customers who want to publish brochures, pamphlets, and other marketing documents. A typical document involves several high-resolution images that consume a significant amount of storage. Considering all the projects that the company is working on, the total amount of storage is very high. The speed of access to the page layouts is not critical.

Page layouts need to be stored for several months after the document is printed. However, after this period, the layouts can safely be discarded.

Assuming that your company is cost conscious, what type of disk storage makes the most sense in this situation? Use factors of the scenario to justify your choice.

7. (12) Discuss the relationships between virtual memory, the computer's bus, and secondary storage.
8. (10) Consider the following clause from the warranty for Norton AntiVirus for Windows 95:

Symantec does not warrant that the Software will meet your requirements or that operation of the Software will be uninterrupted or that the Software will be error-free.

The above warranty is exclusive and in lieu of all other warranties, whether express or implied, including the implied warranties of merchantability and fitness for a particular purpose.

Discuss the issues and implications raised by this clause.

9. (8) You have to download a 1.25 megabyte file to your home computer. Assume that you have a modem rated at 28.8 thousand bits per second (KBPS) and that your modem achieves this rating. Also assume that the asynchronous communication mode is being used.

Calculate how long it should take to download the file under these circumstances. Provide your answer in seconds. Show your work.

10. (10) In the Balmer computer labs, when you start Excel executing, it must first be downloaded from a shared disk and loading into the RAM of your computer. After the completion of this process, Excel executes using the CPU and RAM of your computer.

Does this process fit into the “client/server” model of computing? Explain.

Answer Key

- 1 (a) An extranet is a network using Internet technology (specifically TCP/IP) to provide Internet-like services (e.g., browsers) to selected business partners (customers, suppliers, etc.). Unlike the Internet, an extranet is a private wide-area network

(b) There are several answers – all should focus on reduced costs. These include “a primary goal of the system is reduced cost”, “reducing operating costs, which allows us to give direct reductions in price”, and before the extranet “it costs us about 86 cents a line, but when we take the order electronically it can drop to 41 cents a line.”

(c) There are also several answers – all should focus on making the customer happy. These include “customer satisfaction is a primary goal”, “trying to move more customers into more sophisticated forms of E-commerce to make them happier”, and “customizing price lists and ordering procedures to suit individual accounts”.
2. Magnitude: it is generally safe to say that the more bits that are used, the greater the precision. This is true for both integer and non-integer data types. It is also safe to say that in general, for the same number of bits, non-integer types have greater magnitude than integer types.

Precision: There is not precision issue associated with integer types – they are exact. Precision is an issue with non-integer types because of the base-10 to base-2 conversion problem. Again, the more bits used for non-integer types, the lower the precision error (the greater the precision).
3. Each pixel requires storage. With black & white, only one bit is needed per pixel (0 – white, 1- black). For 16 colors, you need 4 bits per pixel. So as the number of colors increase, the number of bits/pixel increase resulting in larger file sizes.
4. TCP/IP (Transmission Control Protocol/Internet Protocol) is a standard for communication networks. It is the protocol that supports the Internet, intranets, and extranets. It is important because it supports platform-independent access to networks.
5. Yes. Data redundancy results from having the *same* data stored in multiple files/databases. The data integration problem relates to the fact that fields needed to answer a query are stored in *several files/database* but there is no common key in the disparate files/database that facilitates the integration of the information.

They are independent issues (although they both result from using the “traditional file environment” philosophy).

6. An erasable optical disk (magneto-optical) makes sense. This technology provides very economical storage (low cost/mb) plus the media can be reused over time. It also has very high capacity. This technology is not as fast as magnetic hard disk technology, but according to the question, speed is not critical.
7. Virtual memory (VM) is an “extension” of RAM onto the computer’s secondary storage (disk) devices. Pages are moved between RAM and disk via the bus. Thus, a slow bus can reduce the effectiveness of VM. The same can be said for a slow disk. The amount of actual RAM can also impact performance because the more RAM you have, the less the OS will have to resort to using VM.
8. The only expressed warranty is basically worthless – they don’t promise to do anything. They also exclude the UCC implied warranties. This means that there is basically no warranty protection at all.

The exclusion of the implied warranties may not be legal. Generally speaking, a business buyer is supposed to know what these warranties mean and is expected to read and understand the license agreement. Thus, courts have ruled that exclusion of the warranties is valid for business purchases. For the non-business buyer (typical consumer), courts have ruled that exclusion of the warranties is not legal. Under these circumstances, the implied warranties provide some protection for the buyer.

9. If your exam talked about a 1.25 megabyte file, the answer is:

$$(1,250,000 \text{ bytes} \times 10 \text{ bits/byte}) \div 28,800 \text{ bits/second} = 434 \text{ seconds}$$

If your exam talked about a 1.45 megabyte file, the answer is:

$$(1,450,000 \text{ bytes} \times 10 \text{ bits/byte}) \div 28,800 \text{ bits/second} = 503 \text{ seconds}$$

10. No, this does not fit the “client/server” model. The client/server model assumes that specific application tasks are shared between two machines. These tasks include data management, presentation, and application logic.

The model used in the Balmer computer labs is a simple file server. The application is downloaded to the client machine where **all** application logic (Excel), **all** presentation, and **all** data management takes place.