

Beauty and Joy of Computing Unit 4 Assessment

1. What is one use of public key encryption (or public key cryptography)?
 - a. It prevents people from hacking into your computer or intercepting your online conversation.
 - b. It allows data to be sent securely—decodable only by the intended recipient—as long as nobody is hacking the line or "listening in."
 - c. It allows data to be sent securely—decodable only by the intended recipient—even along insecure lines.
 - d. It prevents people from sending you unwanted emails or other spam.
 - e. It is free for the public to use, unlike private systems that must be paid for.
2. How does public key encryption (public key cryptography) differ from symmetric encryption?
 - a. Public key encryption shares all necessary encryption information with everyone: it is public. Symmetric encryption shares decryption information only between the sender and receiver.
 - b. Symmetric and public key encryption both use mathematics to encode messages, but symmetric encryption uses numbers that have symmetry, like 137731 or 82328.
 - c. They are not different. Symmetric and public key encryption both require each party to share all encryption/decryption information with the other.
 - d. Public key encryption makes the encryption key public, and does not require the sender to know any private information about how to decrypt the message.
3. The terms "bandwidth" and "latency" are both used in talking about the amount of time it takes to transmit information. What is the difference between them?
 - a. There is no difference; they are synonyms. Both describe the total TIME it takes to move one megabyte of information.
 - b. There is no difference; they are synonyms. Both describe the total AMOUNT of information that can be moved in one second.
 - c. Bandwidth is a measure of the rate at which the information moves through the system, the amount of data in a fixed time. Latency refers primarily to the wait time before the system can move the data.
 - d. They are roughly opposites. Low bandwidth is caused by high latency.

4. People sometimes treat "the cloud" and "the Internet" as if they mean the same thing. They don't. Which of these explains the difference?
 - a. The Internet is a network of computers. The cloud means all the servers on the Internet, thought of as one big server because you don't know exactly what computer has your data on it.
 - b. The Internet is the path you follow to reach the cloud. The cloud refers to all of the computers on the Internet.
 - c. The Internet is a cloud service provider. The cloud is the storage place for all data.
 - d. The cloud is bigger than the Internet.

5. Choose the best way to complete this sentence: Redundancy improves reliability because...
 - a. ...repeating instructions in a program helps in case an instruction is not executed properly.
 - b. ...having multiple parallel systems capable of doing a task, and a way to monitor success, allows a backup system to be chosen if the originally chosen system fails.
 - c. ...having more equipment on the job makes the job faster and cheaper.
 - d. ...repeating a task several times assures that at least one of those times will work.

6. In computer science, a router is not something you stick down a blocked drainpipe. What is it?
 - a. A computer router opens up a path for Internet communication, from beginning to end, carving it out just as a woodworker router hollows out a shape in wood.
 - b. A router operates like an air traffic controller, making sure that two transmissions on the Internet are safely spaced and don't "crash" into each other.
 - c. A router chooses an open route for the next step in the transmission of data sent over the Internet.
 - d. A router is the device that encrypts your computer's data so that it can be sent over some Internet route.

Match each Internet protocol with a description of its functionality.

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| 7. HTTP | a. A hierarchical system that translates website names into IP addresses |
| 8. DNS | b. Splits data into packets and checks that they all arrive |
| 9. TCP | c. Assigns addresses and routes data packets between them |
| 10. IP | d. Interprets instructions for web page formatting |

11. Select a technological innovation and describe a legal or ethical concern that it raises.

12. Select a technology that has changed the way we communicate and describe the change.

13. Describe how some computer innovation has affected a field or activity that you care about.