

AP Computer Science Principles

Unit 1 - Part 1 Test Review

Name: _____

1. Define the following terms in your own words:

- a. Prototype: preliminary sketch of an idea or model for something new. It's the original drawing from which something real might be built or created.
- b. Computer Science: The study of information and information processes.
- c. Binary Question: A question to which there are only two possible answers.
- d. Binary Message: A message that can only have one of two possible values.
- e. Protocol: formal procedure/set of rules → in C.S., this usually refers to a "communication protocol". Also could be defined as a set of rules governing the exchange of data between devices.
- f. Bit: binary digit (0 or 1)

g. Bandwidth: transmission capacity, measured by bitrate.

h. Bitrate: the number of bits that are conveyed or processed per unit of time (ex. 8 bits/sec)

★ i. Latency: time it takes for a bit to travel from sender to receiver.

high → more delay
low → less delay

j. Number System: A system with a set of symbols that includes rules to represent numbers.

↳ ordering

k. Binary Number System: A 2-bit (symbol) number system

l. ASCII: American Standard Code for Information Interchange. It is universally recognized raw text format that any computer can understand

m. Abstraction: reduces information and detail to facilitate focus on relevant concepts

2. Conversions: Please put a box around your answer and show your work.

a. What is the decimal equivalent of the binary number 1111?

15

8+4+2+1

b. What is the decimal equivalent of the binary number 0100?

4

c. What is the binary number equivalent of the decimal number 10?

1 0 1 0

d. What is the binary number equivalent of the decimal number 123?

1 1 1 1 0 1 1

1 1 1 1 0 1 1
64 32 16 8 4 2 1

3. How many bits would you need if you wanted to have the ability to count up to 500?

~~10~~

9

512 256 128 64 32 16 8 4 2 1

4. Explain the layers of abstraction we covered in this unit and how they are related to each other (think about letters, decimal, binary, formatting, etc.).

Binary numbers can be encoded to represent decimal numbers, which, in turn, can represent letters, which we can continue representing to get formatting.

5. What type of wire/cable best to use over long distances when transmitting data?

fiber optic cable (light)

6. If I have a base 5 numbers system (a number system with 5 symbols), how many 3-place patterns could I make?

5 · 5 · 5 = 125