

1. Physical phenomena are used to represent information. How does the left directional signal in a car illustrate this?

Phenomenon: _____

Presence: _____

Absence: _____

Set to Present: _____

Set to Absent: _____

2. Jean Dominique Bauby answered yes/no questions with “one wink” == yes, “two winks” == no. This seems like a poor encoding since he was sending just one bit. Why didn’t he use, “one wink” == yes, “no wink” == no?
3. “A college teacher gave his class code for Assignment 12, but he accidentally left out one instruction. Days later, only one student had discovered the problem.” The teacher learned one bit of information: Only one student has started the assignment. Explain how he learned this in terms of the basic definition of a “bit.”
4. Think of 3 ways to encode information using coffee cups. Think of three more.
5. How many bit patterns can be created with eight bits? (circle correct)
 - 8
 - $2 \times 8 = 16$
 - $2^8 = 256$
 - 4 for first 4 bits \times 4 for second 4 bits = 16
6. Give some examples of “abstracting”.
7. Encode the six characters “Hello!” in ASCII.
8. Represent the decimal integer 202 as a binary number.
9. Add together two 12-digit binary numbers ... show your carries.

USE THESE DECLARATIONS IN THE FOLLOWING CODE:

```
int x = 4;
```

```
int y = 10;
```

```
float z = 0;
```

```
String letterz = "";
```

10. What does `x` contain as a result of executing this code?


```
if (y%x == 0) { x = x + 1; }
```
11. Given that `||` means ‘or’, what does `x` contain after executing this code?


```
if (x > 0 || y < 0) { x=6; } else { x = 8; }
```
12. What does `letterz` contain as a result of executing this code?


```
letterz = letterz + 'a';
```
13. Define “algorithm”; give it’s five properties
14. Who was Herman Hollerith? What did he do that was so great?
15. Computers are cheap and widely available because of three discoveries/inventions,
 - a. The idea of _____ allows engineers to switch electricity without any “moving parts” to wear out
 - b. The idea of _____ means that the “active and connective” parts of a computer can be built at the same time,” no assembly
 - c. The idea of _____ means that a circuit can be “printed” onto a chip, so it doesn’t matter how _____ the

circuitry is.

16. What is the Fetch/Execute Cycle. What are its components?
17. In today's computer memory, every _____ has an address.
18. Name four datatypes: _____
19. What is the purpose of the noLoop() and loop() functions?
20. Write a function to draw a "gray" box at some position given as a parameter.
21. Show your function from Q. 19 by drawing a white box at 200, 200.
22. Describe in words what the user sees when this program runs

```
int x = 0;
<other code here>
void draw( ) {
  fill(0, 255-x, 0);
  ellipse(100, 100, 50, 50);
  x = x - 1;
}
```
23. Say what the "3 statement exchange" does; show an example.
24. What is the principle that tells us that "bits are it", the only medium we need to representation information?
25. In computing, what or who is "the agent"?
26. What is the difference between a "function declaration" and a "function call"?
27. Write an if-statement to test if the float x is non-negative.
28. Write an if-statement that tests if **age** describes a teenager; that is, someone older than 12, but not yet 20.
29. What is the difference in the meaning of "+" in these two statements:

```
lettersequence = lettersequence + 'a';
smallinteger = smallinteger + 10;
```
30. Look up the ASCII table in the lecture notes, and encode the text: FUN!