AP Computer Science Principles - Big Idea 2 Data Practice Test

Question 1
Which of the following is a true statement about data compression?
    A. Data compression is only useful for files being transmitted over the Internet.
    B. Regardless of the compression technique used, once a data file is compressed, it cannot be restored to its original state.
    C. Sending a compressed version of a file ensures that the contents of the file cannot be intercepted by an unauthorized user.
    D. There are trade-offs involved in choosing a compression technique for storing and transmitting data.

Question 2
Which file type is lossy compressed sound?

    A. mp4
    B. mp3
    C. wav
    D. wma

Question 3
Which type of compression do zip files use?
    A. Lossy
    B. Lossless
    C. Non-compressed
    D. Max compression

Question 4
Which unit is the smallest?
    A. Kilobyte
    B. Megabyte
    C. Gigabyte
    D. Terabyte

Question 5

Which of the following is NOT an example of metadata for an image file?
- A. Size of the image
- B. Date the image was created
- C. Image resolution
- D. Copy of each image pixel

Question 6
A programmer is writing a program that is intended to be able to process large amounts of data. Which of the following considerations is LEAST likely to affect the ability of the program to process larger data sets?
- A. How long the program takes to run
- B. How much memory the program requires as it runs
- C. How many programming statements the program contains
- D. How much storage space the program requires as it runs

Question 7
A student is recording a song on her computer. When the recording is finished, she saves a copy on her computer. The student notices that the saved copy is of lower sound quality than the original recording. Which of the following could be a possible explanation for the difference in sound quality?
- A. The song was saved using fewer bits per second than the original song.
- B. The song was saved using more bits per second than the original song.
- C. The song was saved using a lossless compression technique.
- D. Some information is lost every time a file is saved from one location on a computer to another location.

Question 8
Consider the following numbers: Binary 1100, Decimal 11, Hexadecimal D. Which letter shows the number's order from least to greatest?
- A. Binary 1100, Decimal 11, Hexadecimal D
- B. Decimal 11, Binary 1100, Hexadecimal D
- C. Decimal 11, Hexadecimal D, Binary 1100
- D. Hexadecimal D, Decimal 11, Binary 1100

Question 9
An online store uses 6-bit binary sequences to identify each unique item for sale. The store plans to increase the number of items it sells and is considering using 7-bit binary sequences. Which of the following best describes the result of using 7-bit sequences instead of 6-bit sequences?
- A. 2 more items can be uniquely identified.
- B. 10 more items can be uniquely identified.
- C. 2 times as many items can be uniquely identified.
- D. 10 times as many items can be uniquely identified.

Question 10

What is the best explanation for why digital data is represented in computers in binary?
- A. The binary number system is the only system flexible enough to allow for representing data other than numbers.
- B. As a consequence of history: early pioneers of computing were making secret codes in binary, and this simply evolved into modern computing.
- C. It's impossible to build a computing machine that uses anything but binary to represent numbers
- D. It's easier, cheaper, and more reliable to build machines and devices that only have to distinguish between binary states.

Question 11

Approximately how much bigger (how many more bytes) is a megabyte than a kilobyte?
- A. 1,000 times bigger
- B. 100,000 times bigger
- C. 1,000,000 times bigger
- D. 1,000,000,000 times bigger

Question 12

Which of the following classifies as metadata about a webpage?
- A. The tags that make up the body of the webpage
- B. A table on a webpage
- C. A list on a webpage
- D. The title of the webpage

Question 13

A compression scheme for long strings of bits called run-length encoding is described as follows:

Rather than record each 0 and 1 individually, instead record "runs" of bits by storing the number of consecutive 1s and 0s that appear.

Since it's binary, any run of 0s must be followed by a run of 1s (even if the run is only 1-bit long) and vice versa. Thus, you can store a list of small numbers that represents the alternating runs of 0s and 1s. Above is an example:

To uncompress the data back into its original binary state, you simply reverse the process. This technique is an example of what type of compression?

uncompressed bits 000000000000000111111111110111111111000000000011000000000000001111111

runs of bits: 15   10 1   8   10   2   13   7

run-length encoding: [15, 10, 1, 8, 10, 2, 13, 7]

- A. Lossy Compression
- B. Lossless Compression
- C. Fast Fourier Transform Compression

D. Tailored Compression

Question 14
When would lossless data compression be preferred over lossy one?
    A. When you do not need to get back to the original file
    B. When you need to display the file on mobile devices and websites
    C. When you need to get back to the original file
    D. When you have limited space available on your computer

Question 15
Which of the following is a reason to use lossy compression?
    A. You want to save space and are not concerned if the file is the highest quality possible.
    B. You want the compressed file to be larger than the original.
    C. You want the highest quality audio file possible, with no modifications.
    D. You want the highest quality image file possible, with no modifications.

Question 16
It is the collection of facts and patterns extracted from data.
    A. Metadata
    B. Information
    C. Database
    D. Message

Question 17
It is a data about a data.
    A. Information
    B. Database
    C. Message
    D. Metadata

Question 18
It is a process that makes the data uniform without changing their meaning (e.g., replacing all equivalent abbreviations, spellings, and capitalizations with the same word)
    A. Cleaning data
    B. Formatting data
    C. Creating data
    D. Data review

Question 19
_____ are important tools for finding information and recognizing patterns in data.
    A. Visual tools

B. Data extracting systems
C. Data filtering systems
D. Data monitoring systems

Answer Key
1. D
2. B
3. B
4. A
5. D
6. C
7. A
8. B
9. C
10. D
11. A
12. D
13. B
14. C
15. A
16. B
17. D
18. A
19. C