

Name: _____

Computer Memory Test (Out of 24 Marks)

1. In detail, explain why it is very important for today's computers to have as much memory as possible. What kind of enhancements does it bring to the speed of the computer, and why? (5)

ANSWERS SHOULD BE SIMILAR TO THESE:

Students should outline the fact that data that is currently used is stored in the RAM. Since RAM is faster than permanent storage, this means that the computer will go faster, because the CPU has to wait less to get the data it needs from the memory.

2. a) In order, list the three levels of memory that the CPU tries to access when it needs data. (3)

1. L1 Cache
2. L2 Cache
3. RAM

- b) Why is the permanent storage the "last resort" for the CPU? (2)

Permanent storage is much slower than any of the temporary memory types. The CPU uses storage as a last resort if the memory does not have the required data.

3. In today's RAM, data is stored in memory cells. How is a binary 1 or a binary 0 actually stored in each cell, and how does the computer know if there is a binary 1 or 0 stored in the cell? (4)

To change the state of a cell from 0 to 1, the column and row of that cell are charged, and the capacitor gets filled where the column and row meet, which is where the capacitor is located. Similarly, to change the state of a cell from 1 to 0, the column and row are charged, in order to open a circuit, allowing the electrons to escape from the capacitor.

4. a) What are the two main factors which determine the performance of today's RAM? (2)

1. MHz Speed
2. Latency

- b) Which of these two performance factors has gotten steadily worse over the years? Give an example of how people have tried to improve the performance of the memory? (2)

There are two possibilities. Making a higher MHz Speed, or decreasing the latency by adding Cache to the memory.

c) In the future, which of the two main factors of performance do you think memory makers will focus on more? Why? (4)

This is the student's opinion. Full marks should be awarded as long as the student justifies his opinion about the question asked.

d) Which performance factor do you think should be focused on more? Why? (2)

This is the student's opinion. Full marks should be awarded as long as the student justifies his opinion about the question asked.