Question 1:

Which of the following data storage systems provides the most efficient random access to individual data items?

Main memory
CDs/DVDs
Magnetic disk
Flash drives

- It is the Main memory because it has the fastest link to the CPU and uses RAM devices which exhibit the lowest response time.

- CDs/DVDs and Magnetic disks have moving mechanical parts which need a lot of time to position the reading/writing heads on the correct location and access the data.

- Flash drives employ flash devices which are slower than RAM devices. Their link to the CPU imposes further delays in the transfer of data.

Question 2:

Which of the following storage systems is best suited for storing and retrieving long strings of data such as music that are processed in a sequential order?

ROM chips: do not have adequate capacity.

CDs/DVDs: have adequate capacity. Sequential reads mean minimum seek times. Lowest price per bit of storage. Best suited for this application.

Main memory: do not have adequate capacity. Very expensive.

Magnetic disk: have adequate capacity, but more expensive than CDs/DVDs.

Question 3:

Which of the following mass storage system does not require physical motion?

Main memory: not a mass storage system

Flash drives: mass storage system with no moving parts.

CDs/DVDs: mass storage system with moving parts.

Magnetic disk: mass storage system with moving parts.

Question 4:

Which of the following is a possible LZW compression of the message "xyz xyz xyz"?

12

232

1234

1234545

A dictionary is needed, followed by codes representing strings represented in the dictionary. Although applying the LZW encoding compression algorithm did not yield this result, the structure of this string could be the LZW compression of the character stream because:
1. the initial consecutive numbers hint to a representation of the codes of the alphabet of the character stream – the other candidate strings do not seem to hold enough information on the alphabet
2. final repetition may hint to the repetition of the xyz string
3. the compression ratio of about 1.5 seems reasonable for short byte streams

NOTE: this approach is purely intuitive – application of the LZW algorithm failed to validate the result

Question 5:

Which of the following systems is least efficient when encoding numeric values?

Excess notation

Floating point notation

Two's complement notation

ASCII

One character is required for each digit of the represented number. In the other three systems, a single byte can represent 256 values.

Question 6:

Which of the following is a means of encoding music?

JPEG

GIF

MIDI

ASCII

JPEG & GIF standards are used to encode photos
ASCII is used to encode characters

MIDI: Musical Instrument Digital Interface. It defines an electrical and a logical level interface allowing up to 16 devices to be connected in a single link.
In the electrical level, it uses a differential line to transmit data.
In the logical level, it provides a general structure of commands which can be used for either instrument control, or relay of packets containing digitised music.

Question 7:

Hexadecimal notation is preferred to represent digital data. Choose the incorrect choice.

Computers can understand HEX

It is easier to read HEX

It uses fewer digits than binary

It is convenient and brief

Question 8:

Boris was working on a solution to add two 8 bit numbers. He encounters an error when he adds 11111111 and 11111111. What type of error has occurred in this situation?

Overflow

No error occurred

Syntax error

A logic error

11111111 + 11111111 = **111111110**

Question 9:

Brad is driving around the city trying to locate the new pizza store but the GPS in his car keeps pointing to the street on which no commercial stores exist. Brad is frustrated and gives up. The most likely cause for this type of error is

The GPS coordinate calculations were rounded off

The traffic lights confused him

He doesn't know how to read the directions

Question 10:

Select the correct choice that indicates the increasing level of abstraction in hardware.

Logic gates, chips, memory, motherboard

Logic gates can be made with discrete components.
Chips may contain logic gates and other types of circuits too (decoders, line drivers, oscillators etc).
Memories are made of chips.
Motherboards contain Memories, chips, logic gates etc.