Introduction to Computer Science

15 March 2023

Examination Paper

Answer ALL questions.

Clearly cross out surplus answers.

Time: 2 hours

The maximum mark for this paper is 50.

Any reference material brought into the examination room must be handed to the invigilator before the start of the examination.

Marks

Question 1

a) State the 8-bit binary code for the following:

    i) The denary value 222 **2**

    ii) The hexadecimal value B9 **2**

    iii) The denary value -35 (use Two's Compliment notation) **2**

b) TWO (2) methods of storing characters in computers are ASCII and the Unicode Standard.

    i) State ONE (1) advantage of using Unicode instead of ASCII. **1**

    ii) State ONE (1) disadvantage of using Unicode instead of ASCII. **1**

c) JPGs and MP3's are file types that use lossy compression.

    i) State ONE (1) **image** file type that uses **lossless** compression **1**

    ii) State ONE (1) **audio** file type that uses **lossless** compression **1**

Total 10 Marks

Question 2

a) Briefly explain how a computer makes use of RAM. **3**

b) For each sentence in the bulleted list below select the correct word or phrase in bold to make the statement correct. **5**

- A bus connects the CPU to other **hardware/software** components

- A bus speed is measured in **seconds/ milliseconds/ MHz/ GHz**

- A bus sends 8, 16 or 32 **bits / bytes/ gigabytes** at a time

- The *front-side / back-side bus* connects CPU to memory

- The BSB is **slower / faster** than the FSB

c) State what is meant by a dual core processor. State ONE (1) benefit to the user. **2**

Total 10 Marks

Question continues next page

Question 3

a) A new musical theatre is getting ready to open.

It uses word processing software to type up the scripts the actors use.

For each task below state the **most suitable** type of application software. Do **not** give brand names of software.

    i)   Creating a poster advertising a show   **1**

    ii)   Storing all the actors' personal details so reports can be easily made   **1**

    iii) Storing and calculating the income and profit from ticket sales   **1**

b) Give THREE (3) examples of utility software   **3**

c) State what is meant by an embedded system.   **2**

Give ONE (1) example of technology that contains an embedded system

d) Describe what is meant by *assistive technology* and give ONE (1) example of such technology.   **2**

Total 10 Marks

Question 4
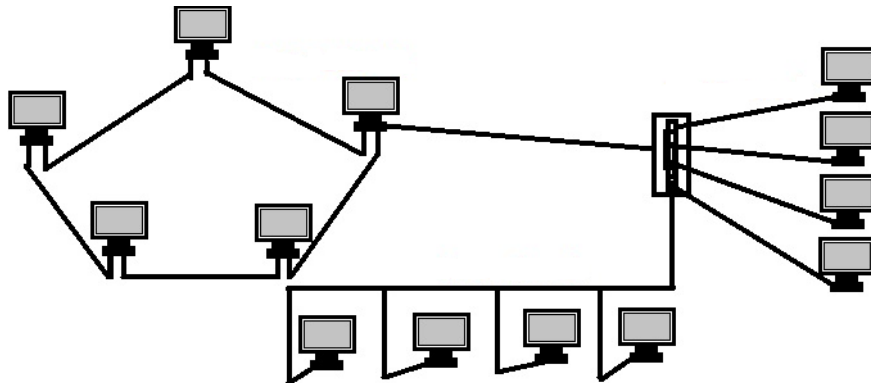
a) State TWO (2) factors that determine the data transfer speed of a network   **2**

b) State the function of the following components in a network

    i)   Repeater   **1**

    ii)   Firewall   **1**

    iii) Proxy Server   **1**

c) Give TWO (2) reasons why Ethernet protocols are often chosen by businesses when setting up a wired network.   **2**

Question continues next page

d) A hybrid network topology can consist of many different types of topologies. **3**
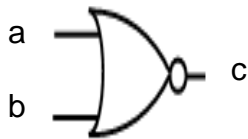
State TWO (2) types of topologies shown in the hybrid network diagram below and state ONE (1) type of cabling that could be used to wire these PC's together.

Total 10 Marks

Question 5

a) Describe the purpose of a truth table **2**

b) Draw a truth table for the following logic gate **4**

c) State THREE (3) offences under the Computer Misuse Act 1990 and ONE (1) penalty for breaking these offences. **4**

Total 10 Marks

End of paper