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|  | **Entrance Examination**  **May 2021** |
| **INFORMATION TECHNOLOGY**  Time allowed: 1.5 hours (90 minutes)  **Answer TWO of the three questions**  Each question answered will be worth 50 marks | |

**Question 1**

a) Explain what a VPN is, and the benefits that a VPN offers to a business.

[12 marks]

b) Suggest, with appropriate justification, ways in which a company could make use of an Intranet, and why they might use the Intranet rather than some other communication method.

[15 marks]

c) The ongoing pandemic has transformed the way in which many businesses work. As staff have been required to work from home the business IT policies have had to change, along with the (server side and client side) software that they use.

Extensively consider the likely effects that this has had on businesses IT departments, how this will affect businesses as the pandemic eases, and the security implications of the changes. Your answer should address data security and data accessibility, as well as other topics that you consider to be relevant.

[23 marks]

**Question 2**

a) The following are among types of software packages commonly used in businesses:

• Databases

• Email clients

• Image editing software

• Web browsers

For each of the above, name two programs that perform that task.

[8 marks]

b) Spreadsheets and databases are both used for storing and processing data.

Extensively discuss the similarities and differences between them, focussing on the tasks that they are designed for and what they offer to different types of users.

[18 marks]

c) The presentation of information in word processed documents is becoming increasingly dependent on layout. Discuss the challenges that the creator of such a document face as they share it with others and consider what they can do to ensure that what they created is what others actually see.

[12 marks]

d) What are digital signatures and how can they be used to ensure the authenticity of documents?

[12 marks]

**Question 3**

a) A computer fundamentally operates on the binary digits 0 and 1. Therefore, any character has to be encoded as a binary number. In ASCII the letter E has the decimal value 69. Give its value in:

i) Binary

ii) Hexadecimal

You must show your working.

[8 marks]

b) Convert the 16-bit binary number 01001100 11011010 to:

i) Hexadecimal

ii) Decimal

You must show your working.

[8 marks]

c) Network data bandwidths (and therefore home broadband speeds) are specified in bits/second. However, end users can never transfer data at this speed.

Explain the reasons for the difference that an end user will see relative to the stated speed. Your answer should include all of the issues that you consider to be relevant as well as demonstrating your understanding of network protocols.

[24 marks]

d) Discuss why consumers, who are generally only familiar with base 10 numbers, can feel aggrieved about the storage sizes of IT products such as hard disks that they purchase.

[10 marks]