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|  | **Entrance Examination**  **February 2023** |
| **INFORMATION TECHNOLOGY**  Time allowed: 1.5 hours (90 minutes)  Answer **TWO** questions. Each question answered will be worth 50 marks. | |

**1**

1. Computer systems require hardware and software parts to implement their functionality. Describe the hardware elements of a modern computer and explain their functions. Explain the interaction between software and hardware in a computer. Discuss how computers intended for different uses can have some hardware or software elements removed from the system, and what kind of systems can be made this way.

[22 marks]

1. Describe the difference between system software and application software. What is the concept of user interface design and why it is so important in application software.

[16 marks]

1. Describe the difference between database management systems and file management systems.

[12 marks]

**2**

1. One of the most common forms of information presentation on the Internet is a website. Most websites can be defined as either static or dynamic, but some of them are hybrids. Describe how you see the difference between static and dynamic websites and give some examples for both of them. Discuss advantages and disadvantages of each and try to think of ways to combine the strengths of both approaches in a hybrid website.

[21 marks]

1. What is the difference between a client-side and server-side language, and consider the advantages of each?

[15 marks]

1. What are the advantages of website user interfaces that are responsive across multiple platforms.

[14 marks]

**3**

a) Explain why computers often use not only binary numeral system, but also octal and hexadecimal numeral systems.

[13 marks]

b) 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 W has the decimal value 87. Give its value in:

i) Binary

ii) Hexadecimal

You should show your working.

[8 marks]

c) Convert the 16-bit binary number 00110111 01001011 to:

i) Hexadecimal

ii) Decimal

You should show your working.

[10 marks]

d) Boolean operators are fundamental to many strands of IT. Explain the behaviours of the binary Boolean operators OR, XOR and AND.

[9 marks]

e) Many programming and search related tasks require that Boolean operators be combined to generate more complex expressions. Create a logic table that describes:

A XOR NOT (B AND NOT C)

[10 marks]

**END OF PAPER**