

3.6. Computer Systems

1. Explain the difference between hardware and software. [2]

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2. a) The operating system is an example of systems software. Using examples, briefly explain the difference between systems software and application software. [3]

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- b) The main purpose of an operating system operating system is to create a virtual machine. What is meant by a virtual machine? [1]

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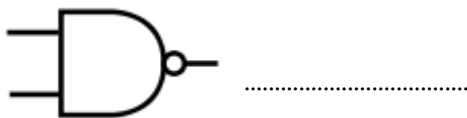
- c) State two types of task that are performed by the operating system. [2]

1.....

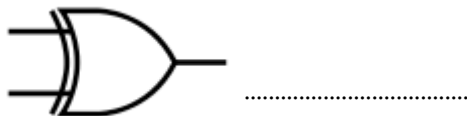
2.....

3. a) What are the functions of the following logic gates? [1]

- i. [1]



- ii. [1]



- b) Describe the result of applying the following logical operators to a condition.

- i. NOT [1]

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- ii. OR [1]

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- c) Complete the following truth table for the XOR operator. [4]

Condition A	Condition B	A XOR B
True	True	
True		True
	True	True
False	False	

- d) What are the results of the following Boolean algebra equations?

i. $0 + 1 + 1 + 0$ [1]

ii. $1 \cdot 0$ [1]

iii. $(0 + 0 + 0) + (0 + (1 \cdot 1))$ [1]

- e) Construct the logic circuit that represents the following expression: [3]

$$Q = ((A \cdot B) \oplus C)$$

4. a) What are the two De Morgan's laws? [2]

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- b) Why are De Morgan's laws important in designing circuit boards? [2]

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c) Show that one of these laws is consistent by producing the truth table for each side of the equation. [4]

A	B	A AND B	NOT (A AND B)

A	B	NOT A	NOT B	NOT A OR NOT B

5. a) Describe the following terms:

i. Machine code [2]

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ii. Assembly language [2]

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iii. High-level language [2]

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b) Describe one advantage and one disadvantage of using a low-level programming language compared to a high-level language. [4]

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6. a) Explain the difference between 'source code' and 'object code'. [4]

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b) Briefly describe each of the different types of translator software. [6]

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Total marks = /50