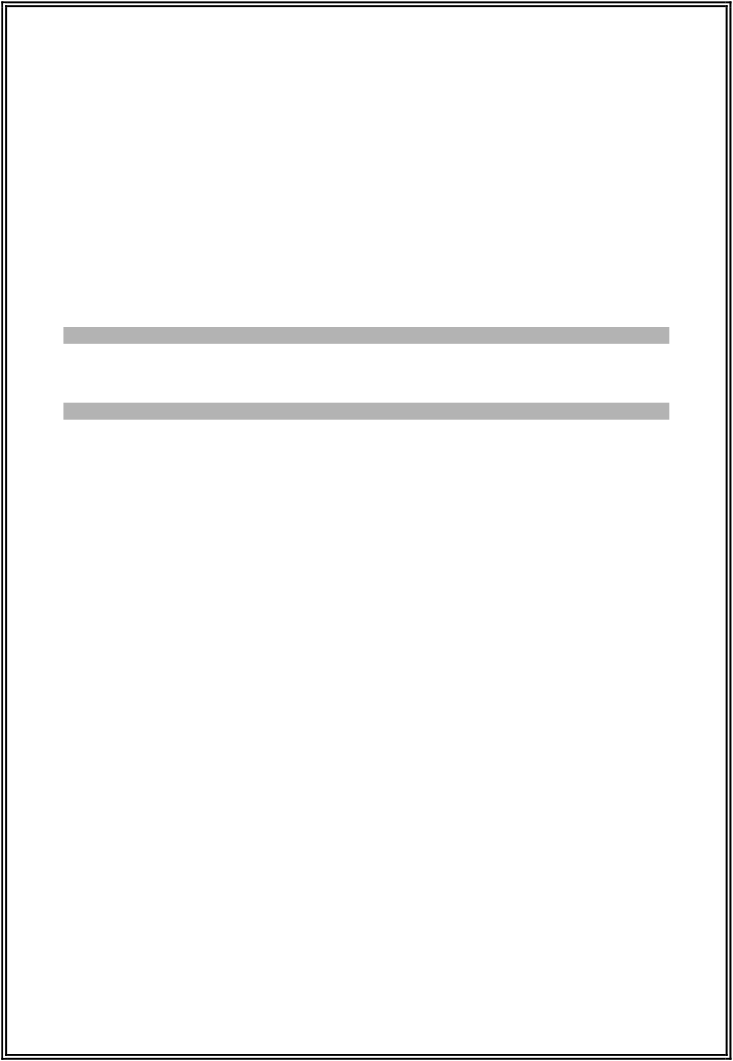
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**GCE AS MARKING SCHEME**



**SUMMER 2017**

**AS (NEW)**

**COMPUTER SCIENCE - UNIT 1 2500U10-1**

**INTRODUCTION**

This marking scheme was used by WJEC for the 2017 examination. It was finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conference was held shortly after the paper was taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conference, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about this marking scheme.

**GCE AS COMPUTER SCIENCE - UNIT 1 (NEW) SUMMER 2017 MARK SCHEME**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Q** | **Answer** | **Marks** | **AO1** | **AO2** | **AO3** | **Total** |
| **1** | **A AND B B XOR (A AND B)**  0 0  0 1  0 0  1 0  One mark for each:   * **A AND B** * **B XOR (A AND B)** | 1 1 |  | 2.1a 2.1a |  | 2 |
| **2** | Hard Disk Drive (max of four)   * Hard drives have a fast transfer rate and a fairly fast access time, they provide a good compromise between storage capacity, performance and cost. * Their speed does not come close to the speed of memory, the CPU or SSD. * Hard drives are a magnetic medium and store data on a hard drive platter. * Data is read and saved using an arm that has a special read/write head at the end. * As the disk spins, the arm travels across the disk. * Each sector of the platter can store data and the movement of both the disk and the read/write head means that every sector on the hard drive can be reached. * The faster the platter spins, the faster data can be read from the disk. This speed is measured in revolutions per minute, or RPM. * A common speed for hard drives is 7200 RPM, but it can vary. * Can be used as a hybrid with SSD. * Fragmentation can slow access speeds | 6 | 1.1b |  |  | 10 |
| **Q** | **Answer** | **Marks** | **AO1** | **AO2** | **AO3** | **Total** |
|  | Optical Drive (max of four)   * Optical drives work by using lasers to store data * Burning microscopic indentations into a disc such as a CD. * This pattern of indentations is created in a spiral pattern,starting from the middle. * Indentations and their absence create pits and lands. * A laser is aimed at the disc and reflected back, which can cause interference with the original laser. * DVD-ROM uses the same techniques to store data, but the data is stored on two layers. * Some optical drives havetwo lasers of differing wavelength that are used to read data from the two layers. * On Bluray pits and lands are stored closer together, meaning that the laser’s wavelength must be shorter (blue).   Comparison between HDD and optical drive:   * Storage capacity – HDD has greater capacity * Speed of access – HDD is quicker / faster * Cost per unit of storage * Durability – Optical is more durable * Portability – Both are portable   Typical Capacity   * **HDD**: 500MB – 4 TB * **OD**: 650MB – 128GB   Typical Use   * **HDD:** Storing programs / OS / Server backup * **OD:** Movies / Music | 2  2 | 1.1b  1.1b |  |  |  |
| **3(a)** | • A protocol is an agreed upon format (set of rules) which allows two devices to communicate. / the transfer of data | 1 | 1.1b |  |  | 1 |
| **3(b)(i)** | • DHCP | 1 |  | 2.1a |  | 1 |
| **3(b)(ii)** | • SMTP | 1 |  | 2.1a |  | 1 |
| **3(b)(iii)** | • TCP/IP | 1 |  | 2.1a |  | 1 |
| **3(c)** | • When a computer system establishes a devices readiness to communicate | 1 | 1.1b |  |  | 1 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Q** | **Answer** | **Marks** | **AO1** | **AO2** | **AO3** | **Total** |
| **3(d)** | * Collision * The transmitting nodes waits a random amount of time before trying to resend the packet | 1 1 | 1.1a 1.1b |  |  | 2 |
| **3(e)** | One mark for each of the following up to a maximum of three:   * Data is split into packets * Each packet has a destination address * Packets are analysed by each node * Packets are sent down the most appropriate path (lowest cost / traffic) to reach its destination * Each node maintains a routing table * Packets may take different routes. * Packets are reassembled at their destination | 3 | 1.1b |  |  | 3 |
| **4(a)(i)** | One mark for each of the following: Storage requirements = 7 bits **Example:** 108 = 1101100  10 2 | 1 1 |  | 2.1a 2.1a |  | 2 |
| **4(a)(ii)** | -63 to +63  10 10 | 1 |  | 2.1a |  | 1 |
| **4(b)** | One mark for each of the following up to a maximum of three:   * Each character is mapped to a binary number * Ensures that computers use the same character representation and can transfer meaningful data * Unicode allows the storage of complex characters such as Chinese script / emojis * Unicode can represent a larger range of characters than ASCII | 3 | 1.1b |  |  | 3 |
| **4(c)** | One mark for each of the following:  **Character:** B = 8 bits (1 byte) **String:** BOB = 24 bits (3 bytes)  Accept 7 bit ASCII example if consistent for both character and string  Accept Unicode or any other **standard** character set | 1 1 |  | 2.1a 2.1a |  | 2 |
| **Q** | **Answer** | | | | | | **Marks** | **AO1** | **AO2** | **AO3** | **Total** |

**This document was truncated here because it was created in the Evaluation Mode.**