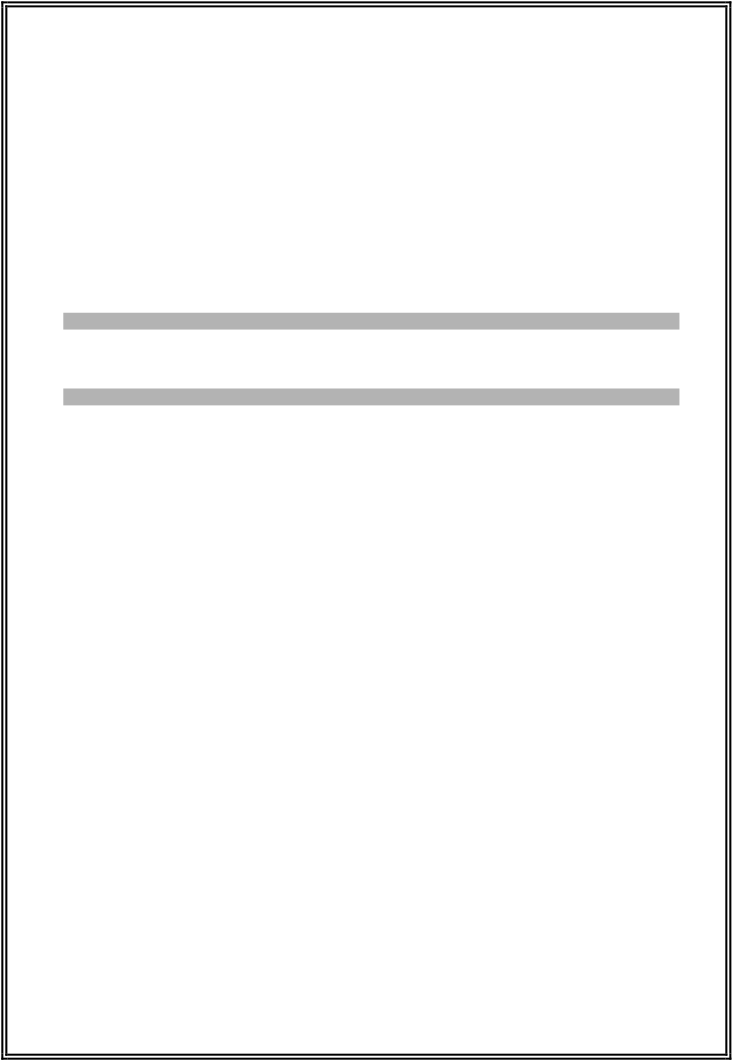
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**GCE A LEVEL MARKING SCHEME**



**SUMMER 2018**

**A LEVEL**

**COMPUTER SCIENCE - COMPONENT 2 A500U20-1**

**INTRODUCTION**

This marking scheme was used by WJEC for the 2018 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.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Mark | AO1 | AO2 | AO3 | Total |
| 1 (a) | SELECT ArrivalDate, ShipName FROM VOYAGE **1 mark** **for:** SELECT ArrivalDate, ShipName  **1 mark** **for:** FROM VOYAGE | 2 |  |  | 3b |  |
| 1(b) | SELECT ContainerID, Contents FROM CONTAINER WHERE VoyageID=(SELECT VoyageID FROM VOYAGE WHERE ArrivingFrom = 'Shanghai')  **1 mark** **for:** SELECT ContainerID, Contents  **1 mark** **for:** FROM CONTAINER WHERE VoyageID=( .. )  **1 mark** **for:** SELECT VoyageID FROM VOYAGE WHERE ArrivingFrom = 'Shanghai'  **Accepted not expected**  SELECT ContainerID, Contents FROM (VOYAGE JOIN CONTAINER ON ContainerID) WHERE ArrivingFrom = 'Shanghai'  **1 mark** **for:** SELECT ContainerID, Contents  **1 mark** **for:** FROM (VOYAGE JOIN CONTAINER ON ContainerID). **Award the mark for** **joining the two tables in a query,** even ifsyntax is not exactly correct.  **1 mark** **for:** WHERE ArrivingFrom = 'Shanghai' | 3 |  |  | 3b |  |
| 1(c) | 1 mark for each point up to a maximum of three.  CREATE TABLE DISPATCH (  ContainerID Integer PRIMARY KEY not NULL, Dispatched Boolean,  Date DateTime,  Transport String(12)  )  **1 mark** **for:** CREATE TABLE DISPATCH **1 mark for:** Primary Key  **1 mark for:** fields.  **1 mark for:** data types. Accept Date as a string field.Transport: accept any suitable length for the string, or no length specified | 3 |  |  | 3b |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Mark | AO1 | AO2 | AO3 | Total |
| 2(a) | **1 mark** for the concept that the bytes are subjected to left shifts during each time interval.  **1 mark:** Least significant bits (at the right of the bytes) are replaced by zero bits. | 2 |  | 2b |  | 4 |
| 2(b) | **1 mark** for the concept that the bytes are subjected to right shifts during each time interval.  **1 mark:** Least significant bits leaving the right of the byte are copied after shifting to the most significant bit positions at the left of the bytes. | 2 |  | 2b |  |  |
| 3(a) | **1 mark** for each reason.  The database is not in third normal form as:   * ApplicantName is dependent on ApplicantID, which is not the key field of APPLICATION / ApplicantName is duplicated * InspectorName is dependent on InspectorID, which is not the key field of INSPECTION / InspectorName is duplicated | 2 |  | 2a |  | 10 |
| 3(b) (i) | **1 mark** for each of the three 1 : n relationships. **1 mark** for 4 suitable table names | 4 |  | 2b |  |  |
| 3(b) (ii) | Tables should be similar to:  APPLICANT (ApplicantID **[P]**, ApplicantName, ApplicantPhone…)  APPLICATION (ApplicationID **[P]**, PropertyLocation, WorkDescription, ApplicantID **[F]** …)  INSPECTION (InspectionID **[P]**, Date, ApplicationID **[F]**, InspectorID **[F]**, Comments… )  INSPECTOR (InspectorID **[P]**, InspectorName…)  **2 Mark** for 4 primary keys clearly identified (1 mark for each 2 correct)  **1 mark** for each of 3 foreign keys clearly identified | 5 |  | 2b |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Mark | AO1 | AO2 | AO3 | Total |
| 4 | **Indicative Content**  **Gas Billing** Batch processing.  Bills are issued regularly in response to meter readings.  **Traffic Lights** Real time control processing.  Traffic lights have timed intervals, and may also react to the arrivals of traffic.  **Theatre Booking** Real time transaction processing. To avoid double bookings, the ticketing database is updated immediately payment is made. | 1 1  1  1 1 1 | 6 | 2a |  | 6 |
| 5(a) | **1 mark** for concept that IMAP is used to upload/download e-mail between the user's computer and an internet server.  **1 mark** for SMTP transfers e-mail between internet servers. | 1 1 | 1a 1a |  |  | 11 |
| 5(b) | **1 mark** for FTP applications use TCP  **1 mark** Concept that TCP has error checking facilities, which ensure that correct packets of data are received to construct the file.  **1 mark** If packets are found to be corrupted, replacement copies can be requested. | 1 1 1 |  | 2b 2b 2a |  |  |
| 5(c) | **1 mark** for video applications use UDP  **1 mark** Concept that UDP does not have error checking facilities.  **1 mark** For video streaming, it is better to accept occasional corruption of the picture or sound, rather than pausing the presentation while replacement data packets are downloaded. | 1 1  1 |  | 2b 2b  2a |  |  |
| 5(d) | **1 mark** for the concept that IP provides an address which identifies a computer device on a network.  **1 mark** Concept that DHCP can (dynamically) allocate an IP address when a device connects to a network.  **1 mark** This IP address will apply for a single session then may be reallocated. | 1 1 1 | 1b 1b 1b |  |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Mark | AO1 | AO2 | AO3 | Total |
| 6(a) | **1 mark** for the concept that weather forecasts must be produced quickly, otherwise there will be insufficient advance warning of weather events. 5 hours is too long a delay between obtaining weather station data and issuing a forecast. | 1 |  | 2b |  | 4 |
| 6(b) | Using Amdahl's Law:  T = T ( L + P/N ) **1 mark**  p s  where T is parallel processing time, T is time using a  p s  single processor system, L is fraction of the processing which must be linear, P is fraction which can be run in parallel, and N is the number of processors.  Therefore:  T = 5 (0.2 + 0.8/12 ) **1 mark**  p |

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