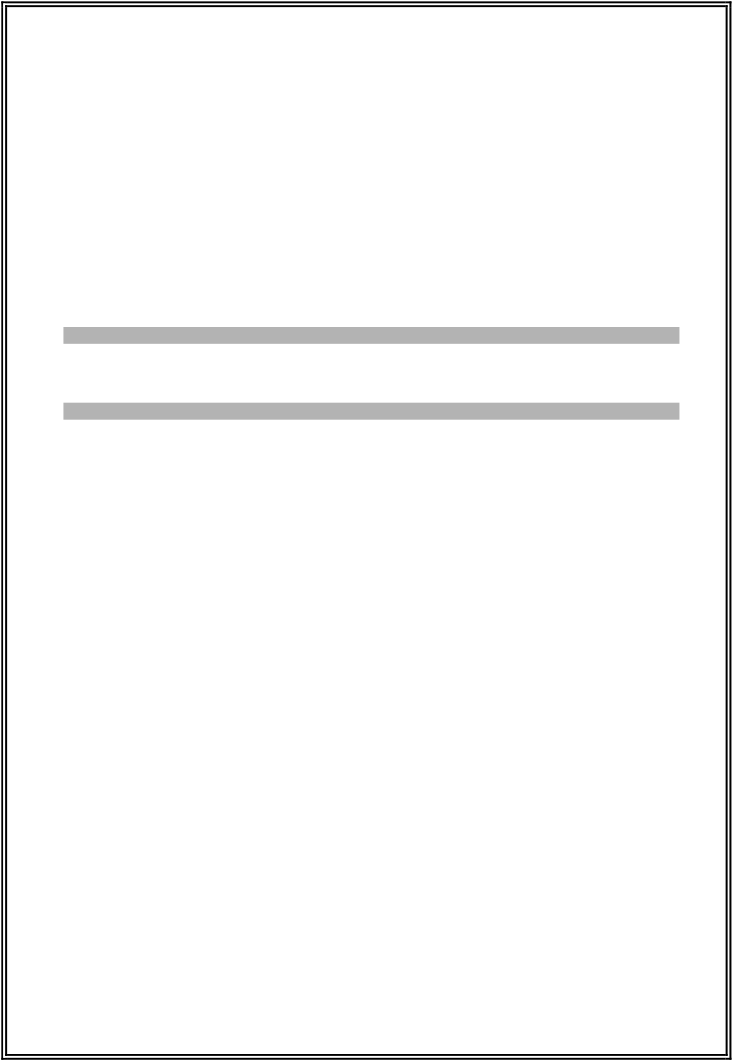
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**GCE A LEVEL MARKING SCHEME**



**SUMMER 2017**

**A LEVEL (NEW)**

**COMPUTER SCIENCE - UNIT 3 1500U30-1**

**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 A LEVEL COMPUTER SCIENCE SUMMER 2017 MARK SCHEME**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Qu** | **Answer** |  |  |  |  |  |
| 1(a) | Any one of the following up to a maximum of two:  Two benefits of using a touch screen human computer Interface are:   * No need for another pointing device such as a stylus * Can pinch and expand to scale images/text * Screen can be used for input as well as output so device can be small * Intuitive, so easy for beginners to learn to use * Limits number of peripherals needed | 2 |  | 2a |  | 2 |
| 1(b) | Any one of the following up to a maximum of four:  Difficulties creating a natural language interface include difficult to recognise:   * two words that sound the same such as ‘two’ and ‘to’ * user’s voice changes due to a cold or sore throat or other impediment * colloquialisms or local dialect * speech where there is background noise * proper nouns that might not be in dictionary * strong accents * words from other languages in common use such as ‘sacré bleu’ in English | 4 | 1b |  |  | 4 |
| 2 | The term ‘class’ refers to the written code which is used to define a template for an object  An object is an instance of a class (an actual thing created using the template) Methods are actions (behaviours) that an object can perform or can be performed on the object | 1  1 1 | 1b  1b 1b |  |  | 3 |
| 3(a) | **A B C Ā Ā.B P**  0 0 0 1 0 0 0 0 1 1 0 1 0 1 0 1 1 1 0 1 1 1 1 1 1 0 0 0 0 0 1 0 1 0 0 1 1 1 0 0 0 0 1 1 1 0 0 1  Marking  one mark for all possible values of A, B and C correct  one mark for each correct column if column P correct award full marks | 1 3 |  | 2a 2a |  | 4 |
| 3(b) | **Bit number 7 6 5 4 3 2 1 0** Register contents 1 1 1 0 0 0 1 1 Mask 0 0 0 0 1 1 1 1  Result 0 0 0 0 0 0 1 1  Marking  Correct mask – one mark  Identify AND operation – one mark produce correct result – one mark | 1 1 1 |  | 2a 2a 2a |  | 3 |
| **Qu** | **Answer** |  |  |  |  |  |
| 4(a) | One mark for each point up to a maximum of 6. Must address all three sections to gain maximum marks, otherwise maximum of 5.  **Lexical analysis**   * Comments and unneeded spaces are removed * Keywords, constants and identifiers are replaced by 'tokens' * A symbol table is created which holds the addresses of variables, labels and subroutines   **Syntax analysis**   * Tokens are checked to see if they match the spelling and grammar expected, using standard language definitions. This is done by parsing each token to determine if it uses the correct syntax for the programming language. * If syntax errors are found, error messages are produced   **Semantic analysis**   * Variables are checked to ensure that they have been properly declared and used * Variables are checked to ensure they are of the correct data type, e.g. real values are not being assigned to integers * Operations are checked to ensure that they are legal for the type of variable being used e.g. you would not try to store the result of a division operation as an integer | 6 | 1b |  |  | 6 |
| 4(b) | One mark for each of the following up to a maximum of two:  Advantage of using a language that requires compiling compared with a language that requires interpreting are:  Once compiled the program will run quickly / the object code will be efficient  because the compiler will translate directly to the native code of the specific machine / optimise the code for the target hardware.  Protection of intellectual property | 1 1  1 | 1b 1b  1b |  |  | 2 |
| 4(c) | Two advantages for a program developer of using a language that requires interpreting compared with language that requires compiling are:  Debugging can be easier as interpreter will stop translation at the point where the error occurred and highlight the error for the programmer to deal with.  Code is more portable as it is not machine dependent and will run on different hardware or in a browser (java script)  For security when downloading code from the Internet so it can be checked before interpreting on the local machine (2 marks) | 1 1  1 1 | 1b 1b  1b 1b |  |  | 4 |
| 4(d) | The purpose of an assembler is to translate assembly language into machine (executable) code  An assembler’s source code is low level code, compliers translate high level source code.  An assembly instruction which will translate to one machine code instruction, whereas single lines of high level code compile to many machine code instructions. | 1 1 2 | 1a 1b 1b |  |  | 4 |
| **Qu** | **Answer** |  |  |  |  |  |
| 5(a) | One possible solution is:  A **.** (A **.** B)  A . (A . B) use de Morgan´s Theorem on (A . B) 🡪 A.(A + B) use distributive law 🡪  A + B A.A + A.B 0 + A.B A.B  A.A + A.B use A.A = 0 🡪  0 + A.B use 0 + A = A 🡪  A.B  Marking  Correctly applying rules/identities to arrive at correct answer – 4 marks  Correctly applying rules/identities but arriving at incorrect answer then one mark per correct rules/identity applied – **max** 3 marks  NOTE  Candidate must use De Morgan's law, however may use more or fewer rules and correctly arrive at the answer – award full marks | 4 |  | 2a |  | 4 |
| 5(b) | One possible solution is:  A.B + A.(B + C) + B.(B + C) A.B + A.C + B.B + B.C  A.B + A.C + B + B.C  A.B + A.C + B  A.C + B  NOTE  Candidate may use more or fewer rules and correctly arrive at the answer – award full marks | 4 |  | 2a |  | 4 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Qu** | **Answer** |  |  |  |  |  |
| 6 | **Indicative Content**  1 Start Procedure SortMyArray  2 n is integer  3 temp is integer  4 swapped is boolean  5  6 set n = length(myArray){returns the length of myArray} 7 repeat  8 set swapped = FALSE  9 for i = 0 to (n – 1)  10 if myArray[i] <= myArray[i + 1] then |

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