

Candidate Name	Centre Number	Candidate Number

WELSH JOINT EDUCATION COMMITTEE  
 General Certificate of Education  
 Advanced Subsidiary/Advanced



CYD-BWYLLGOR ADDYSG CYMRU  
 Tystysgrif Addysg Gyffredinol  
 Uwch Gyfrannol/Uwch

341/01

**COMPUTING CP1**

**SOFTWARE AND SYSTEM DEVELOPMENT**

A.M. TUESDAY, 22 May 2007

(1½ hours)

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1	4	
2	5	
3	3	
4	4	
5	4	
6	5	
7	6	
8	6	
9	5	
10	6	
11	12	
<b>Total</b>	<b>60</b>	

**INSTRUCTIONS TO CANDIDATES**

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Answers should be written in the spaces provided. Where the space is not sufficient for your answer, continue the answer at the back of the book, taking care to number the continuation correctly.

The intended marks for questions or part questions are given in brackets [ ]. You are advised to divide your time accordingly. The total number of marks available is 60.

You are reminded of the necessity for good written communication and orderly presentation in your answers.

1. Two different types of programming errors are *syntax errors* and *logical errors*. Explain each of these terms, giving **one** example in **each** case:

(i) syntax error; [2]

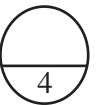
.....  
.....

example .....

(ii) logical error; [2]

.....  
.....

example .....



2. Data is held about the cars for sale at a car dealership.

In **each** case, name the most suitable data type for the storage of the following data:

(i) the model name for the car, for example *Fiesta*; [1]

.....

(ii) the number of doors, for example *4*; [1]

.....

(iii) the average miles per gallon achieved by the car, for example *38.4*; [1]

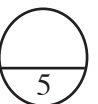
.....

(iv) whether or not the car is new, for example *TRUE*; [1]

.....

(v) a single letter code for whether the fuel used is petrol, diesel or other, for example *P*. [1]

.....



3. A systems analyst uses various methods to find out how an existing system works. These include:

- *interviewing* staff who use the current system
- asking staff who use the current system to complete *questionnaires*

(i) Describe **one** advantage of using *interviews* over *questionnaires*. [1]

.....

.....

(ii) Describe **one** advantage of using *questionnaires* over *interviews*. [1]

.....

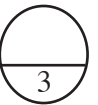
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(iii) The systems analyst may also find it useful to use the existing system or observe the existing system in use.

Describe **one** other method which the systems analyst can use to find out about an existing system. [1]

.....

.....



4. (a) Computer programs need to be well documented.

State **two** types of documentation, in **each** case stating whom it would be written for. [2]

Type 1: .....

.....

written for .....

Type 2: .....

.....

written for .....

(b) Well written computer programs often contain different types of *self-documentation*.

Describe **two** types of self-documentation. [2]

Type 1: .....

.....

.....

Type 2: .....

.....

.....



5. A taxi firm asks each driver to record the following information each time the taxi is hired:

- the number of passengers using the taxi
- the journey starting point, for instance Railway Station
- the journey ending point, for instance Cardiff Road

The taxi firm then enters the data into a computer program.

(i) A *rogue value* is used in this data.

(I) What is the purpose of a rogue value? [1]

.....

.....

(II) Which of the three data items being input in this case is most suitable for a rogue value? [1]

.....

(III) Give a suitable rogue value in this case. [1]

.....

(ii) Name a data structure which could contain all three items of data for one journey as a single item. [1]

.....



6. (a) Using a **clearly labelled diagram**, explain how a *binary search* is used to locate an element in an array. [3]

(b) Another type of search is the *linear search*.

(i) State **one** situation in which it would be essential to use a linear search rather than a binary search. [1]

.....  
.....

(ii) Give another situation in which either type of search could be used, but where it would probably be more sensible to use a linear search. [1]

.....  
.....

7. The secretary of a small social club makes use of an integrated package to communicate with the club's members.

(i) Explain the term *mail-merge* and give an example to show how the secretary might use *mail-merge*. [3]

.....  
.....  
.....  
.....  
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.....

(ii) The secretary sometimes uses a feature of the integrated package which allows a small set of instructions or keystrokes to be recorded for later use.

(I) What is the name given to this feature? [1]

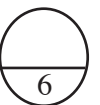
.....

(II) Describe **one** way in which this set of instructions or keystrokes can be run. [1]

.....  
.....

(III) Give an example of how the secretary might make use of this feature. [1]

.....  
.....



8. The river flowing through a certain city floods occasionally, causing widespread damage. The river authority monitors the water level in the river hourly, and when necessary issues either a *standard warning* or a *high-priority warning*. The data used include both the current river level and the increase in river level during the last hour.

The algorithm used is shown below:

```

1 input RiverLevel
2 input LevelIncreaseDuringLastHour
3 if ( (RiverLevel > 12) OR ( (RiverLevel > 8) AND (LevelIncreaseDuringLastHour > 3) ) )
4     then output "High-Priority Warning"
5     else if ( (RiverLevel > 10) OR ( (RiverLevel > 8) AND (LevelIncreaseDuringLastHour > 1) ) )
6         then output "Standard Warning"
7         else output "No Warning"

```

- (a) (i) State what the output will be when the inputs are:

River level = 13                      Increase in river level during the last hour = 2                      [1]

.....

- (ii) State what the output will be when the inputs are:

River level = 9                      Increase in river level during the last hour = 0                      [1]

.....

- (iii) State what the output will be when the inputs are:

River level = 11                      Increase in river level during the last hour = 0                      [1]

.....

- (iv) State what the output will be when the inputs are:

River level = 7                      Increase in river level during the last hour = 4                      [1]

.....



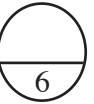
- (b) The algorithm on the opposite page is correct. However, it is accidentally entered incorrectly, so that the word **OR** in line 5 is changed to **AND**

Line 5 now becomes:

```
5 else if ( (RiverLevel > 10 ) AND ( (RiverLevel > 8) AND (LevelIncreaseDuringLastHour > 1) ) )
```

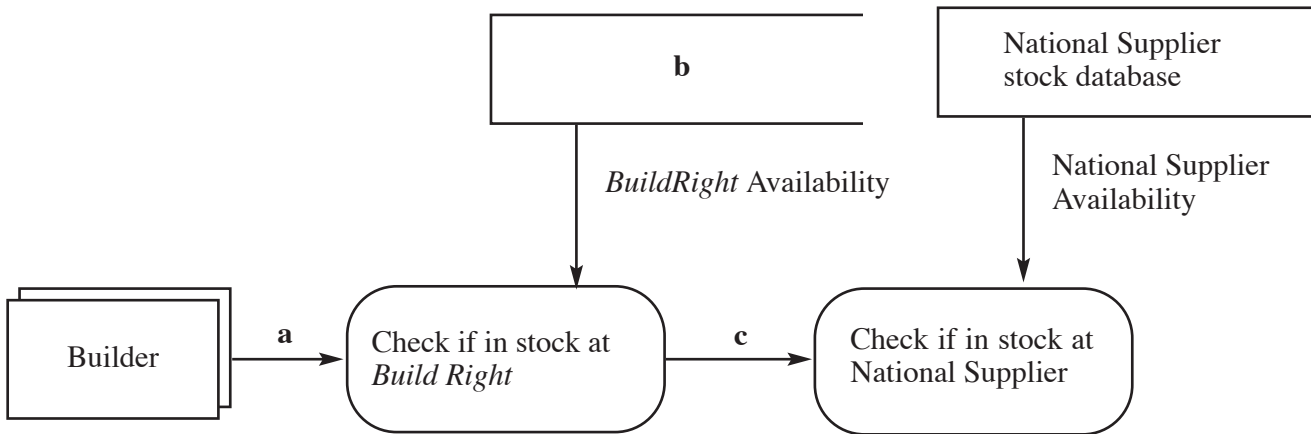
One of the parts (a) (i) to (iv) now gives a different output. State which part gives a different output and write down what the output will now be. [2]

.....  
.....



9. A building firm buys items (such as windows and doors) from *BuildRight*, a local builders' merchant. *BuildRight* carry a large amount of stock. Sometimes, however, an item is out of stock at *BuildRight*, and staff at *BuildRight* then check if it is available from a national supplier.

The situation described is shown below:



- (i) What type of object does the following shape represent?



[1]

- (ii) Give a suitable name for the object shown as **a** in the diagram.

[1]

- (iii) Give a suitable name for the object shown as **b** in the diagram.

[1]

- (iv) Give a suitable name for the object shown as **c** in the diagram.

[1]

- (v) This type of diagram shows the flow of data in a computer system. Why is it important to show data flow? [1]

10. (a) A certain programming language is very good at handling complex calculations. Describe an application which could sensibly be written in this type of programming language. [1]

.....  
.....

(b) Describe **one** feature which it would be useful to have in a programming language used in a commercial application. [1]

.....  
.....

(c) Many computer programs use *iteration*. What is meant by the term *iteration*? [1]

.....  
.....

(d) Explain the difference between a *global variable* and a *local variable*. [2]

.....  
.....  
.....  
.....

(e) Describe the function of a *translation program* when applied to a source program. [1]

.....  
.....

