

Candidate Name	Centre Number	Candidate Number

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

**WJEC**  
**CBAC**

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

341/01

**COMPUTING CP1**

**SOFTWARE AND SYSTEM DEVELOPMENT**

P.M. THURSDAY, 8 June 2006

(1½ hours)

--	--

Affix bar-coded label here

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

**INSTRUCTIONS TO CANDIDATES**

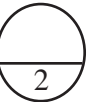
Write your name, centre number and candidate number in the spaces at the top of this page.

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. It is important that the Human-Computer Interface (HCI) of any computer system is well designed. Give **two** reasons why this is important. [2]

.....

.....

.....

.....

- 2. (a) A program contains an error where a command word is accidentally left out.
  - (i) What is the name for this type of error? [1]

.....

- (ii) Give another example of **this** type of error, other than where a command word is left out. [1]

.....

.....

- (b) The following statement is a part of another program:

**FinalValue = Input1 / Input2**

- (i) State a circumstance under which this statement could contain a *logical error*. [1]

.....

.....

- (ii) State a circumstance which will cause an *execution error* when this statement is executed. [1]

.....

.....

(c) Errors are often located and resolved during program maintenance.

(i) What is the name of the type of maintenance where errors are located and resolved? [1]

.....

(ii) Explain what is meant by the term *perfective* maintenance, giving **one** example where it might be necessary. [2]

.....

.....

.....

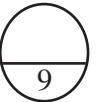
.....

(iii) Name and describe **one other** type of maintenance. [2]

.....

.....

.....



3. (a) Documentation is particularly useful to a programmer who wishes to make changes to an existing computer program. Give **two** reasons why good documentation is important in this case. [2]

.....

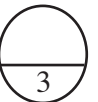
.....

.....

.....

(b) State **one other** type of documentation. [1]

.....



4. A local council is researching the use of public transport and how this use is affected by weather conditions. A certain bus is timetabled to leave the town bus station daily at 8:15 am. Each day, researchers note the number of passengers on the bus as it leaves, together with the temperature and other data.

(i) What data type would be most suitable for storing the number of passengers? [1]

.....

(ii) What data type would be most suitable for storing the temperature? [1]

.....

(iii) Name an item of data from this research which would most sensibly be stored in a *boolean* data type. [1]

.....

(iv) Each month, all this data is keyed into a computer system for analysis. A rogue value is used during the input of the passenger number data.

Describe the purpose of a *rogue value* and suggest a value for it in this case. [2]

.....

.....

.....

.....



5. A firm stores data about its customer accounts on its computer system in a particular order.

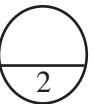
(i) What name is given to the process in which data items are put into order? [1]

.....

(ii) Why might it be useful to the firm to store the data in order? [1]

.....

.....



6. A mobile phone company employs people to sell phone contracts to members of the public in the street. **Sales data** for each salesperson each month are recorded as shown below:

Staff Code	Sales data for each month Number of phone contracts sold					
	Jan	Feb	Mar	Apr	May	...
1	256	210	185	...	...	...
2	317	297	324	...	...	...
3	...	...	...	...	...	...
...	...	...	...	...	...	...

- (i) What is the full name for this type of data structure? [1]

.....

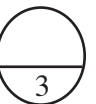
- (ii) State the circumstance under which it would be better to store data in a *record*, rather than in the above data structure. Give an example of data (related to the phone company staff) which should be stored in a record. [2]

.....

.....

.....

.....



7. It is often necessary to choose whether to develop an application using a programming language or using a software package.

(i) There are various types of programming languages, for instance *high-level* and *low-level* languages. Explain the difference between *high-level* and *low-level* languages. [2]

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

(ii) Not all high-level languages are designed for the same purpose. Give an example of an application which might sensibly use programs written in a *scientific* language. [1]

.....  
.....

(iii) If the decision is made to develop the application using a software package, extensive use may be made of *macros* and *data portability*.

Giving an example in **each** case, explain what is meant by:

(I) a macro; [2]

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

(II) data portability. [2]

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

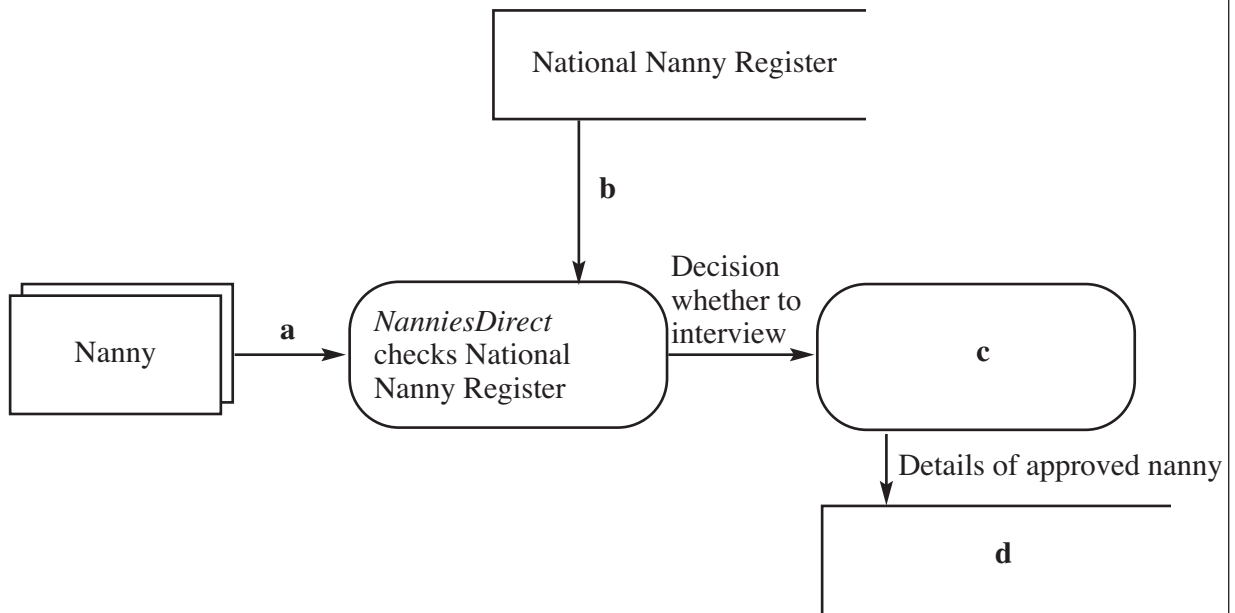
(iv) State **one** advantage that the use of a software package is likely to have over the use of a programming language. [1]

.....  
.....

**BLANK PAGE**

8. *NanniesDirect* is an agency which helps parents in a certain town to find a suitable person to look after their children. People who wish to work as nannies can apply to *NanniesDirect*, who check on a national register of nannies before interviewing the person. If all is satisfactory, the person's name is added to *NanniesDirect*'s own register.

The diagram below illustrates the situation described.



- (i) What name is given to this type of diagram? [1]  
.....
- (ii) What type of object does the open box represent? [1]  
.....
- (iii) Draw the shape used in the diagram to represent an *external entity*. [1]



(iv) Give a suitable name for the object shown as **a** in the diagram. [1]

.....

(v) Give a suitable name for the object shown as **b** in the diagram. [1]

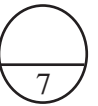
.....

(vi) Give a suitable name for the object shown as **c** in the diagram. [1]

.....

(vii) Give a suitable name for the object shown as **d** in the diagram. [1]

.....



9. Lliwedd College runs a one-year course for students consisting of six modules. At the end of the course students are awarded a *Distinction*, a *Merit* or a *Pass*, or they may fail.

The algorithm used is shown below:

Statement	
1	input ModulesPassed
2	input MeanMark
3	if (ModulesPassed = 6 AND MeanMark >= 70)
4	then output "Distinction"
5	else if (ModulesPassed = 6 AND MeanMark >= 60)
6	then output "Merit"
7	else if (ModulesPassed >=5 AND MeanMark >= 50)
8	then output "Pass"
9	else output "Fail"

- (i) (I) Write down the output for a student who passes 6 modules with a mean mark of 66. [1]
- .....
- (II) Write down the output for a student who passes 4 modules with a mean mark of 66. [1]
- .....
- (III) Write down the output for a student who passes 5 modules with a mean mark of 54. [1]
- .....
- (IV) Write down the output for a student who passes 6 modules with a mean mark of 72. [1]
- .....
- (ii) The algorithm above is correct. Assume now that it is **incorrectly** copied so that the word "else" is omitted from statement 7 as shown below.

7	if (ModulesPassed >=5 AND MeanMark >= 50)
---	---

- (I) Write down all the output **which the incorrect algorithm will give** for a student who passes 6 modules with a mean mark of 66. [1]
- .....
- .....
- (II) Write down all the output **which the incorrect algorithm will give** for a student who passes 4 modules with a mean mark of 66. [1]
- .....
- .....

10. Describe **in detail** how a binary search works, using a diagram if you wish.

[3]

.....

.....

.....

.....

.....

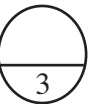
.....

.....

.....

.....

.....



11. In the following question, additional credit (up to 3 marks) will be gained if your answer demonstrates skill in written communication.

A software house has been asked to develop a complex suite of programs for a bank.

Before writing the programs, it is necessary to carry out a requirements analysis and produce a requirements specification. The programmers then intend to use a top-down design method, and use standard modules where possible.

Describe **in detail** what is meant by the terms requirements analysis and requirements specification and give a **detailed** explanation why the software house might choose to use a top-down design method and standard modules. [9+3]

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

