

Candidate Name	Centre Number	Candidate Number
		2



**GCE AS/A level**

341/01

**COMPUTING CP1**

**SOFTWARE AND SYSTEM DEVELOPMENT**

A.M. FRIDAY, 16 May 2008

1½ hours



For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1	3	
2	4	
3	6	
4	3	
5	9	
6	7	
7	4	
8	6	
9	7	
10	11	
<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. A human computer interface (HCI) is usually designed to make the computer system as easy to learn and use as possible.

Describe three features of an HCI which will make it easy to learn and use. [3]

Feature 1 .....

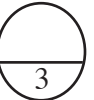
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Feature 2 .....

.....

Feature 3 .....

.....



- 2. One type of program maintenance is *perfective* maintenance.

Name **two** other types of program maintenance and describe, in **each** case, a situation when it would be necessary. [4]

Name .....

Situation: .....

.....

Name .....

Situation: .....

.....



3. (a) Describe why it is useful to write a computer program in small clearly documented sections. [2]

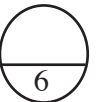
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(b) Describe why it is useful to use *standard modules* when writing a computer program. [2]

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.....  
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(c) Explain the difference between a *high-level programming language* and a *low-level programming language*. [2]

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4. *Systems software* is one of the two major types of software.

(i) Describe what is meant by the term *systems software*. [1]

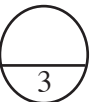
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(ii) Give an example of *systems software*. [1]

.....

(iii) Name the other major type of software. [1]

.....



5. (a) A Chemistry student records various items of data for entry into a computer program.

The data includes:

- an observation code (for instance A, B, C...)
- the temperature of a liquid in degrees Celsius (for example 24.6)
- the name of the chemical used (for example *sodium bicarbonate*)
- whether or not there is a colour change in the liquid

- (i) State the most appropriate data type for **each** of the following: [4]

(I) the observation code

.....

(II) the temperature

.....

(III) the chemical name

.....

(IV) whether or not there is a colour change.

.....

- (ii) Name **one** data type other than those used in (i). [1]

.....

- (iii) A *record* could be used to store all four data items from one experiment. Why would a record be suitable in this case? [1]

.....

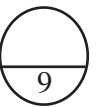
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- (b) There are a number of students in the Chemistry class and their marks for a number of tests are recorded by their teacher.

Give the name of a data structure which would be useful for recording all the students' marks, and draw a diagram to illustrate this data structure.

Name of data structure: ..... [1]

Diagram: [2]



- 6. The basic cost of an item does **not** include VAT. The following program extract, **which contains two errors**, is intended to calculate the cost, including VAT, of a number of items purchased.

```

Statement
1   VatRate = 0.175
2   repeat
3       input BasicCost
4       Vat = BasicCost * VatRate
5       CostWithVat = BasicCost – Vat
6       outptu CostWithVat
7   until BasicCost = -999

```

- (i) For **each** of the two errors, name the type of error and write down the corrected statement. [4]

Error 1:

Type of error: .....

Corrected statement: .....

Error 2:

Type of error: .....

Corrected statement: .....

- (ii) Name a third type of programming error. [1]

.....

- (iii) (I) What is the purpose of the value -999 in statement 7? [1]

.....

- (II) What is the name given to a value which is used in this way? [1]

.....

7. *Cemaes Driving School* employs a number of driving instructors and office staff. *Cemaes* use a paper-based system to store and manage customer names and addresses and also bookings for driving lessons.

The owner of *Cemaes* employs a systems analyst to investigate the current system and design a new computer-based system. The systems analyst asks current users to fill in a *questionnaire* and also *interviews* current users of the system.

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

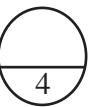
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(ii) Apart from *questionnaires* and *interviews* describe **one** other method which the systems analyst might use to investigate the current system. [1]

.....  
.....

(iii) The systems analyst produces a *requirements specification*. Describe what is likely to be contained in a *requirements specification*. [2]

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



8. People travelling to some countries are advised that they should be vaccinated against certain diseases.

For one such disease, travelling to some countries is considered to be medium risk, travelling to other countries is considered to be low risk, and travel to all other countries is considered to be of no risk at all.

The age of the traveller is also important, with very young or elderly people being at different levels of risk.

There are two types of vaccination (**A** and **B**) which are suitable in different circumstances.

The algorithm shown below is used to determine whether the traveller should be vaccinated.

Statement

```

1  input CountryRisk
2  input Age
3  if ((CountryRisk = medium) AND (Age > 70))
4      then output "Vaccinate with A"
5  else if (((CountryRisk = medium) AND (Age < 5)) OR ((CountryRisk = low) AND
6      (Age > 70)))
7      then output "Vaccinate with B"
      else output "Do not vaccinate"
```

- (i) (I) Write down the output for a traveller aged 72 travelling to a low risk country. [1]

.....

- (II) Write down the output for a traveller aged 4 travelling to a low risk country. [1]

.....

- (III) Write down the output for a traveller aged 35 travelling to a medium risk country. [1]

.....

- (IV) Write down the output for a traveller aged 72 travelling to a medium risk country. [1]

.....



- (ii) The above algorithm is correct. However it is **incorrectly** entered, so that the word “**OR**” in statement 5 is changed to “**AND**” as shown below.

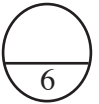
```
5     else if (((CountryRisk = medium) AND (Age < 5)) AND ((CountryRisk = low) AND (Age >70)))
```

Describe **in detail** what will happen if this incorrect algorithm is used instead of the correct algorithm. [2]

.....

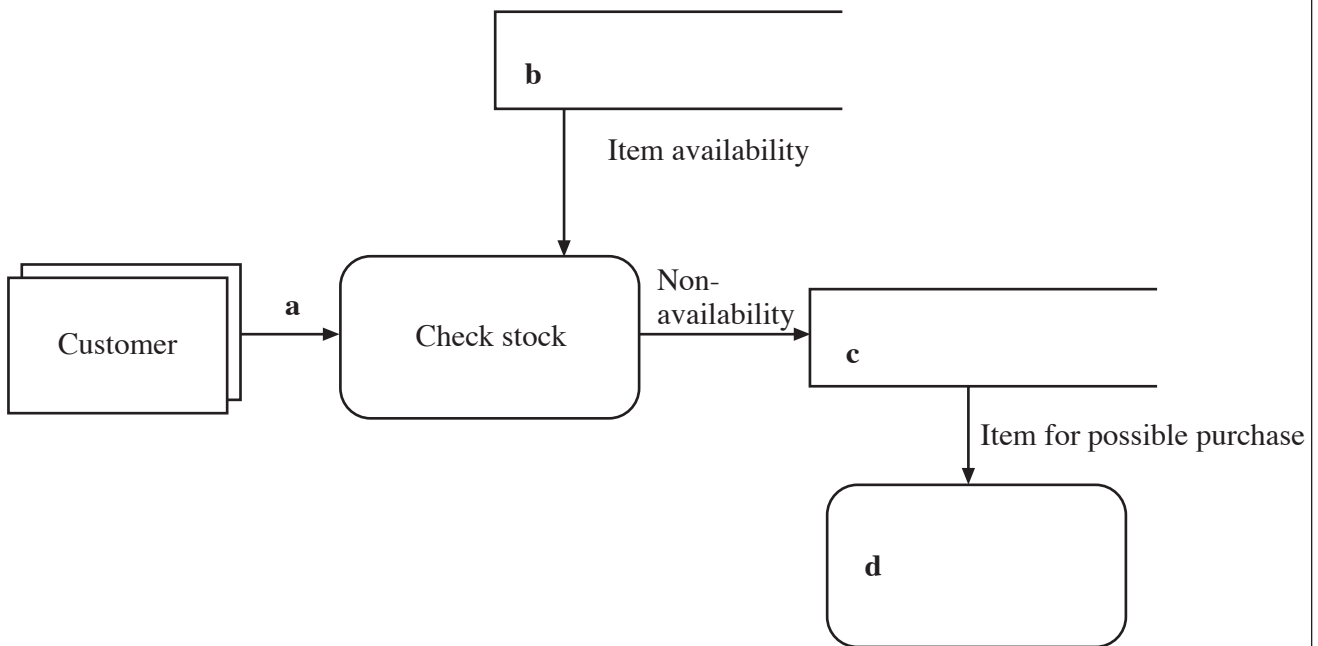
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9. A company hires items, for instance decorating or building equipment, to customers. When a customer makes an enquiry, the staff check the availability of the item. If the item is not available for any reason, this fact is recorded, and each month, a decision is made by the company whether or not to purchase any of the items.

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 *shadow box* represent? [1]  
.....
- (iii) Draw the shape used in the diagram to represent a *data store*. [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]

.....

