

Surname	Centre Number	Candidate Number
Other Names		2



GCE A level

1101/01

**COMPUTING CGI
SOFTWARE AND SYSTEM DEVELOPMENT**

A.M. FRIDAY, 25 May 2012

3 hours

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1	6	
2	7	
3	8	
4	3	
5	4	
6	6	
7	5	
8	6	
9	4	
10	10	
11	6	
12	6	
13	4	
14	3	
15	2	
16	9	
17	11	
Total	100	

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use pencil or gel pen. Do not use correction fluid.

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 100.

You are reminded of the necessity for good written communication and orderly presentation in your answers. Assessment will take into account the quality of written communication used in your answers to question 17.



M A Y 1 2 1 1 0 1 0 1 0 1

1. Colin owns a small painting and decorating company. Colin visits a client's house to give an estimate for a painting job. Estimates are stored on his laptop computer.

(a) For **each** of the following data items name the most suitable data type for storing:

the client's phone number, [1]

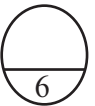
the number of whole days it should take to complete the job, [1]

the area to be painted in square metres, for example 13·5, [1]

whether the client receives a discount, for example TRUE. [1]

(b) State the data structure that would be most suitable to store all the data required for the estimate, briefly describing why it is the most suitable data structure. [2]

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3. A take-away restaurant takes orders for home food deliveries over the telephone. The orders are written down on paper and given to the chef.

The manager of the restaurant decides to computerise the ordering system. All the meals and prices will initially be entered into a database and customer addresses will be entered when they place their first order.

- (a) Briefly describe **one** possible problem with the current paper-based system and describe how a computerised database system could solve **this** problem. [2]

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- (b) Apart from solving problems with the current paper-based system, describe an additional benefit the new computerised system will provide for the customer. [1]

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- (c) Briefly describe a useful report that the new computerised system could produce for the manager. [1]

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(d) When an order is placed data is entered into the new computerised system. Validation checks will be applied to the data.

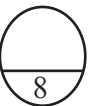
One item of data that is validated is the total number of each menu item ordered. Describe a suitable validation check that could be carried out in this case. Give an example of **invalid** data that would be detected by **this** check. [2]

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(e) Another item of data that is validated is the customer's postcode. Describe a **different** suitable validation check that could be carried out on the customer's postcode, for example CX99 2QW, giving an example of invalid data that would be detected by this check. [2]

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- 4. Customers of a supermarket can create an on-line account using the supermarket’s web site. When they are logged onto their account they are able to view past orders, change contact and payment details and view the points balance on their loyalty card. Some of this data could be subject to *accidental damage* caused by the customer or by a supermarket employee.

Define the term *accidental damage*. Give an example of *accidental damage* that could occur to data in the customer’s account and briefly describe how the supermarket could prevent this problem. [3]

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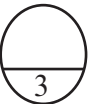
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5. Many homes now have several computers connected using a wireless network.

(a) Briefly describe the hardware required to set up a wireless network in the home. [2]

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(b) The wireless network allows portable devices such as laptop computers to connect to the network. Describe another type of wireless device that could be connected, giving a typical use of this device on the network. [2]

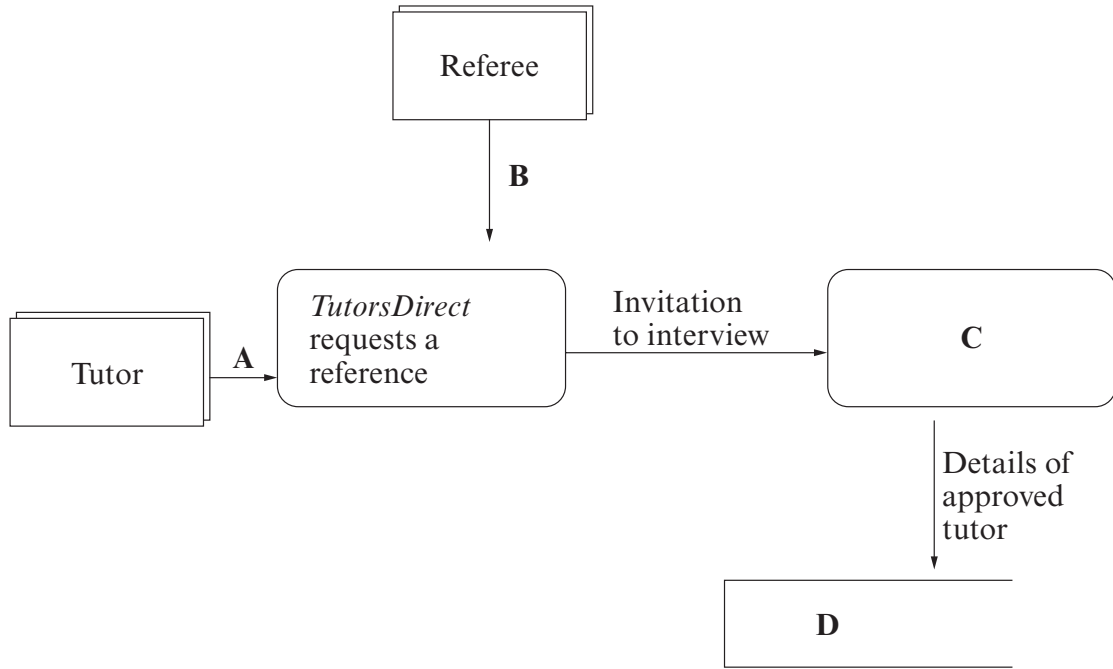
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- 6. *TutorsDirect* is an agency which provides specialist subject tutors for private tuition of children. People who wish to work as tutors can apply to *TutorsDirect*, who request a reference. If the reference is satisfactory the tutor is invited for an interview. If the interview is satisfactory their details are added to *TutorsDirect*'s own register.

The situation described is shown in the diagram below:



- (a) What type of object does the shape below represent? [1]



Draw the shape used in the diagram to represent an external entity. [1]



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

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

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

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

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7. Below is an algorithm.

Algorithm Summer2012

X is integer

Y is integer

Z is integer

i is integer

startmainprog

input X

input Y

set Z = 1

for i = 1 to Y

set Z = Z * X

next i

output Z

endmainprog



- (a) Complete the table below to show how each variable changes when the algorithm is performed on the test data given. [4]

Test data: $X = 2$ and $Y = 4$

i	X	Y	Z
	2	4	1
1			

- (b) Briefly describe the purpose of this algorithm. [1]

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8. Below is an algorithm.

Algorithm

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FirstNum is integer      {number input by user}
SecondNum is integer    {number input by user}

    declare subprocedure FindDifference {procedure to find the difference of two numbers}

    Difference is integer      {the difference of the two numbers}

    start

        if FirstNum > SecondNum then set Difference = FirstNum - SecondNum
        if SecondNum > FirstNum then set Difference = SecondNum - FirstNum
        if FirstNum = SecondNum then set Difference = 0
        output Difference

    end

startmainprog
    output "type in first number"
    input FirstNum
    output "type in second number"
    input SecondNum
    call FindDifference

endmainprog

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- (a) Write down **one** example of annotation from the algorithm above and explain why annotation is used in computer programs. [2]

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(b) Using examples from the algorithm opposite, describe the difference between local and global variables. [4]

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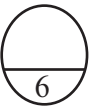
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9. Below is a segment of an algorithm that **attempts** to determine the least number of coins that can be used to make up the number *AmountInPence* which is input by the user. This algorithm will not produce the correct output in every case.

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input AmountInPence

set AmountLeft = AmountInPence

if AmountLeft  $\geq$  50 then
    output " 50p "
    set AmountLeft = AmountLeft - 50
endif

if AmountLeft  $\geq$  20 then
    output " 20p "
    set AmountLeft = AmountLeft - 20
endif

if AmountLeft  $\geq$  10 then
    output " 10p "
    set AmountLeft = AmountLeft - 10
endif

if AmountLeft  $\geq$  5 then
    output " 5p "
    set AmountLeft = AmountLeft - 5
endif

if AmountLeft  $\geq$  2 then
    output " 2p "
    set AmountLeft = AmountLeft - 2
endif

if AmountLeft  $\geq$  1 then
    output " 1p "
    set AmountLeft = AmountLeft - 1
endif
```



(a) Using the algorithm opposite, write down **all** the outputs, produced for the following test data: [3]

Test data: AmountInPence = 37

Test data: AmountInPence = 97

Test data: AmountInPence = 44

(b) Briefly describe why the algorithm does not produce the correct output in every case. [1]

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(c) Files stored using a certain operating system can have four different file attributes which are *read-only*, *archive*, *system* and *hidden*.

State the attribute that would be the **most** suitable for the following.

A file no longer in regular use but may be required some time in the future. [1]

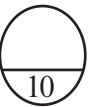
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A file the user should not be able to alter. [1]

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A file only used by the operating system. [1]

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14. Two computer programmers are discussing different computer languages. One of the programmers writes programs in a low level language and the other writes programs in a high level language.

Describe, giving a reason, a situation where a programmer may decide to use a low level programming language. Give one reason why most programmers prefer to use a high level programming language. [3]

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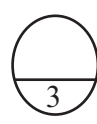
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15. A company that employs many computer programmers requires them to sign a code of conduct. Give **two** reasons why most companies would find a *code of conduct* useful. [2]

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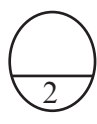
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(b) Tickets to see popular performers are often sold on the internet. They go on sale at a set time, there can be a rush to buy them and sometimes they sell out very quickly. The most suitable mode of operation for selling these tickets is a *real time transaction processing* system.

Describe **in detail** what happens when a ticket is sold and explain why real time transaction processing is the most suitable mode of operation. [3]

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