



ADVANCED SUBSIDIARY GCE
COMPUTING
 Programming Techniques and Logical Methods

F452

Candidates answer on the Question Paper

OCR Supplied Materials:
None

Other Materials Required:
None

Friday 22 January 2010
Morning

Duration: 1 hour 30 minutes



Candidate Forename		Candidate Surname	
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Centre Number						Candidate Number				
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INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided, however additional paper may be used if necessary.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is **100**.
- This document consists of **24** pages. Any blank pages are indicated.

(c) The file will be arranged as an indexed sequential file.

(i) Using the member file as an example, describe what is meant by an indexed sequential file.

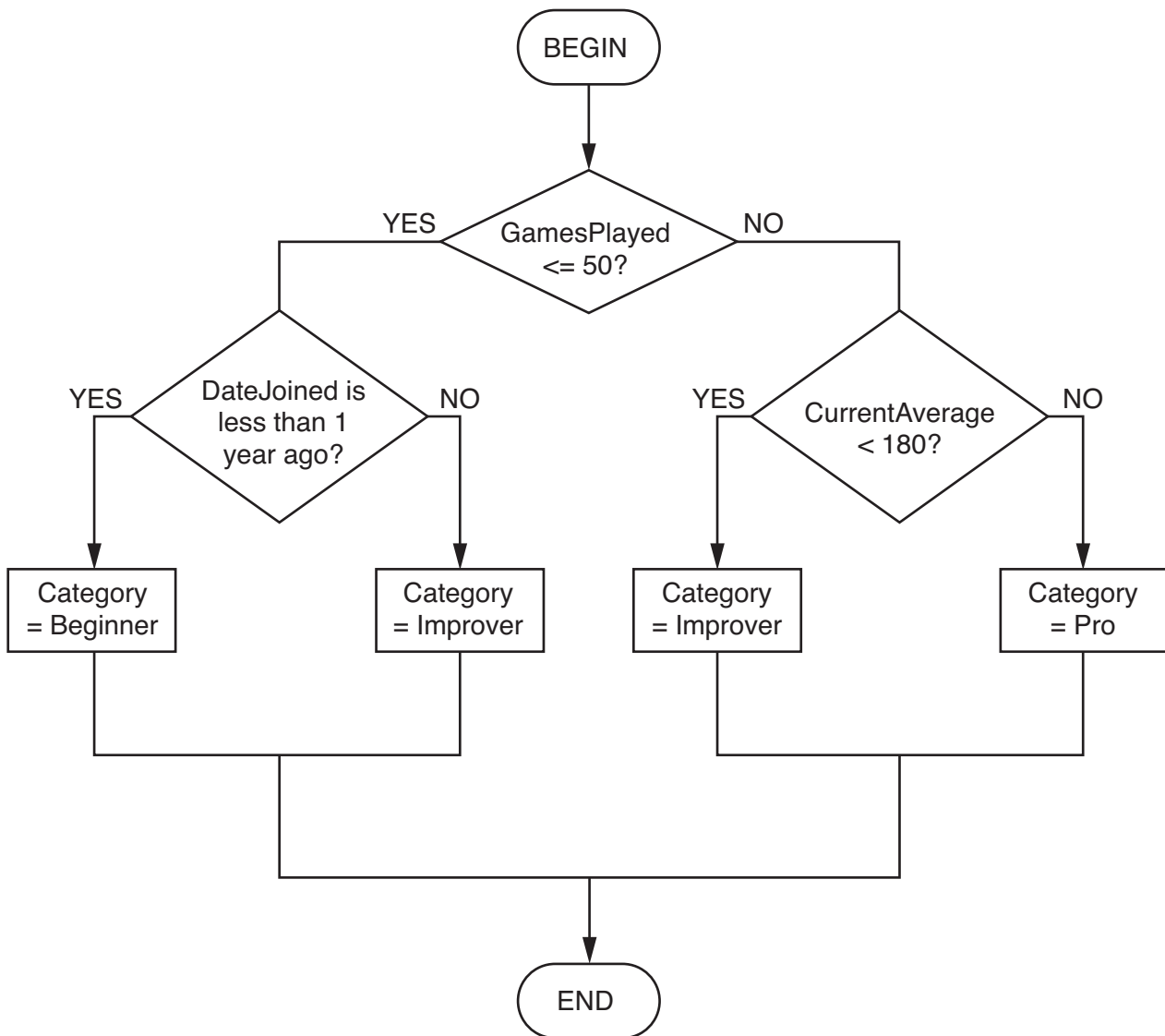
.....
.....
.....
.....
.....
.....
.....
.....
..... [4]

(ii) Explain why an indexed sequential file is a suitable way to organise the member file.

.....
.....
.....
..... [2]

The computer places the members into three different categories – Beginner, Improver and Pro – according to the data in their record.

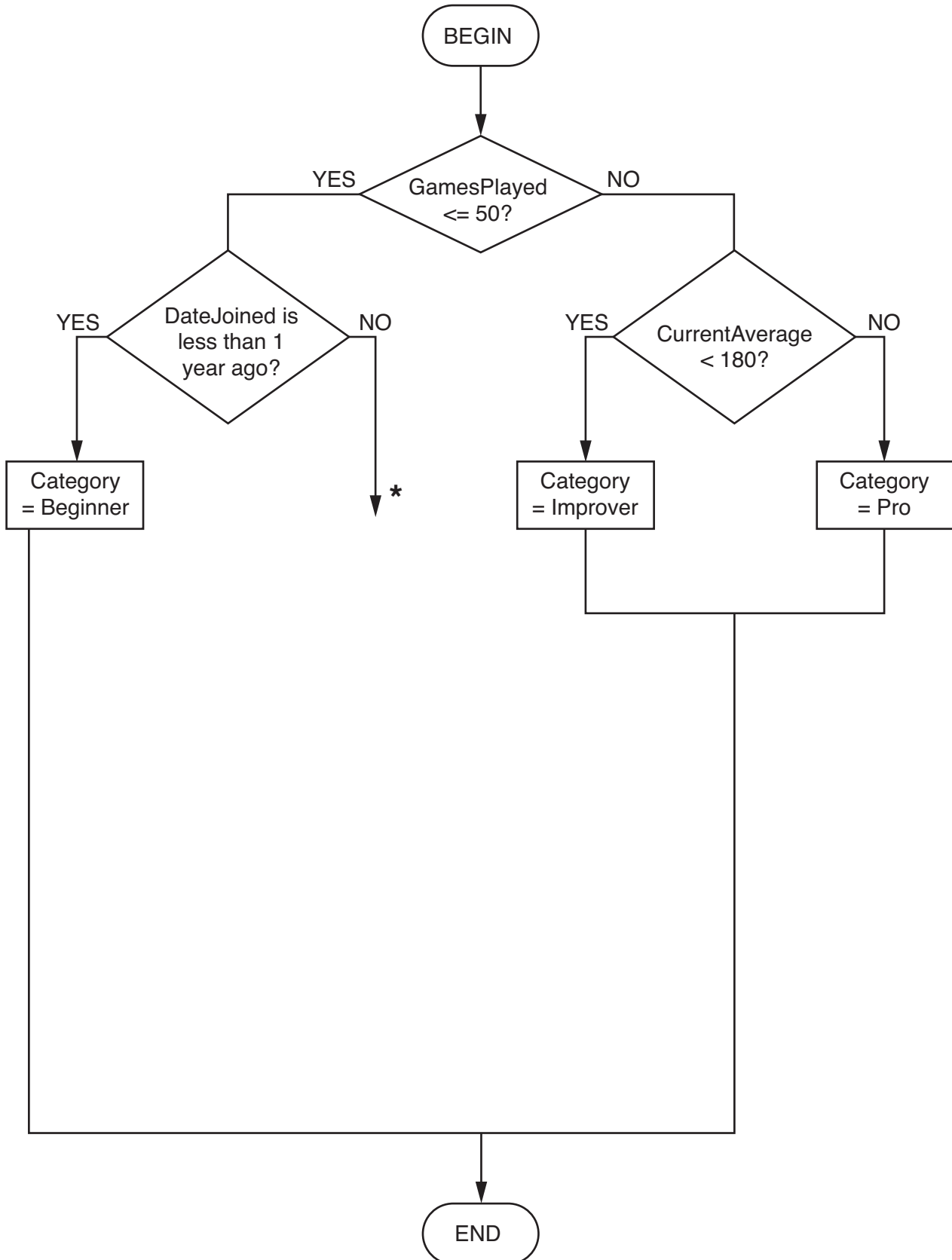
The method used to decide which category a member belongs to is given in the flowchart below.



(e) The club changes the rules.

Complete the flowchart at the arrow marked * to show:

- If the CurrentAverage ≥ 200 then the category should be Pro,
- otherwise the category should be Improver.



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2 A program contains the following procedure to calculate the number of tiles needed to cover a floor.

```
01 PROCEDURE solveit(L, W, T)
02 a = L DIV T
03 b = (W DIV T) + 1
04 c = a * b
05 d = c + (c DIV 10)
06 OUTPUT d
07 END PROCEDURE
```

(a) Identify the programming construct which has been used in this procedure.

..... [1]

(b) This procedure has parameters.

(i) Describe what is meant by a parameter.

.....
.....
.....
.....
.....
..... [3]

(ii) State the parameters of this procedure.

..... [1]

(c) The procedure is called as follows:

```
solveit (400, 230, 50)
```

State the values of the variables a, b, c, and d at the end of this procedure call.

a =

b =

c =

d =

[4]

(d) The value output in line 06 represents the number of tiles needed to cover the floor.

By concatenating strings to the value of d, format the output statement in line 06 so that it is user friendly.

.....

.....

.....

..... [2]

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3 A company produces a game which is to be played on mobile phones.

In the game, a character moves forward and backward along a platform, and can also jump or duck to avoid obstacles. The game is controlled using the standard keypad of the telephone.



The pseudo-code to control the character is

```
01 REPEAT
02   INPUT Key
03   Move Character according to the key input
04 UNTIL the end of platform is reached
```

(a) This code uses iteration.

(i) Describe what is meant by iteration.

.....

.....

.....

..... [2]

(ii) Describe **two** types of iteration construct other than the type used in the pseudo-code above.

Type 1

.....

.....

.....

Type 2

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.....

..... [4]

- (b) To implement line 03 of the pseudo-code, the programmers decide to use a SELECT CASE statement.

Explain what is meant by a SELECT CASE statement, and how it can be used to move the character.

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..... [4]

- (c) The design for the game also contains the following pseudo-code

```
01 IF Character has reached end of platform
02   Display "YOU WIN"
03   REPEAT
04     Play Music
05   END IF
06   UNTIL any key is pressed
```

- (i) Explain why this pseudo-code contains an error.

.....
.....
..... [2]

- (ii) State the type of error the pseudo-code contains and when the error would be detected if implemented.

Type of error

When detected

..... [2]

(d) Name and describe **one other** type of error which can occur in a program, stating when it would be detected.

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..... [3]

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- 4 A mail order company charges for delivery depending on the volume and the weight of the items purchased. A computer program processes orders and calculates the cost of delivery.

Here is an extract from the program.

```
01 BEGIN PROGRAM
02
03 VARIABLE TotalWeight : REAL
04 VARIABLE TotalVolume : REAL
05
06 PROCEDURE CalculateTotals()
07
08     VARIABLE i : INTEGER
09
10     TotalWeight = 0
11     TotalVolume = 0
12
    ...
```

- (a) In line 03 of this extract, TotalWeight is declared as a global variable.

- (i) Describe what is meant by a variable.

.....

.....

.....

.....

.....

.....

.....

..... [3]

- (ii) Identify **one other** global variable and **one** local variable declared in the extract shown.

Global variable:

Local variable: [2]

(iii) Explain the difference between a global variable and a local variable.

.....
.....
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..... [4]

(b) Explain why lines 10 and 11 are needed.

.....
.....
.....
..... [2]

(c) The program is tested using beta-testing and acceptance testing.

Explain the difference between beta-testing and acceptance testing.

.....
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..... [4]

- (d) The code for calculating the total weight and the total volume of the items purchased is shown below.

```
10 TotalWeight = 0
11 TotalVolume = 0
12
13 FOR i = 1 TO NumberOfItemsOrdered
14     TotalWeight = TotalWeight + WeightOfItem(i)
15     TotalVolume = TotalVolume + VolumeOfItem(i)
16 NEXT i
```

A dry run uses the following test data:

NumberOfItemsOrdered = 2

WeightOfItem(1) = 0.3
VolumeOfItem(1) = 200

WeightOfItem(2) = 0.1
VolumeOfItem(2) = 150

Complete the trace table opposite, showing each line of the algorithm which will be executed. On each line, write down the new values of any variables that are changed.

You may not need every row in the table.

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