

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International Advanced Subsidiary and Advanced Level

MARK SCHEME for the October/November 2014 series

9691 COMPUTING

9691/23

Paper 2 (Written Paper), maximum raw mark 75

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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1 (a) DIM Tally[1 : 4] OF INTEGER

1 mark for size

1 mark for data type (must be integer)

[2]

(b) (i) PROCEDURE InitialiseArrayCounts

DECLARE i : INTEGER

FOR i ← 1 TO 4

 Tally[i] ← 0

ENDFOR

ENDPROCEDURE

1 mark for declaration/local variable

1 mark for loop 1 to 4

1 mark for array element set to 0

PROCEDURE InputStudentChoices

REPEAT

INPUT Choice

 Tally[Choice] ← Tally[Choice] + 1

UNTIL Choice = 0

ENDPROCEDURE

1 mark for replacing CASE statement with single array element assignment

[4]

(ii) Football

Accept f.t. from (b)(i) (if array elements not numbered 1 to 4)

[1]

(c) PROCEDURE OutputTallyChart

 OUTPUT "1 Cricket "

 OutputTally(Tally[1])

 OUTPUT "2 Football "

 OutputTally(Tally[2])

 OUTPUT "3 Tennis "

 OutputTally(Tally[3])

 OUTPUT "4 Swimming "

 OutputTally(Tally[4])

ENDPROCEDURE

2 marks for all 4 array elements correct. 1 mark for 3 correct.

PROCEDURE OutputTally(SportCount : INTEGER)

IF SportCount > 0 // 1 mark

THEN

FOR i ← 1 TO SportCount // 1 mark

 OUTPUT ` `

ENDFOR // 1 mark

ENDIF

OUTPUT NEWLINE // 1 mark

ENDPROCEDURE

[6]

(d)

Type of test data	Example test data	Justification
Normal	e.g. 1 or greater	Check correct number of bars output
Boundary	0	0 is smallest possible value And no bars should be output
Extreme	e.g. 2000	How is the procedure going to deal with a large number, more than bars fit on a line

1 mark for each cell

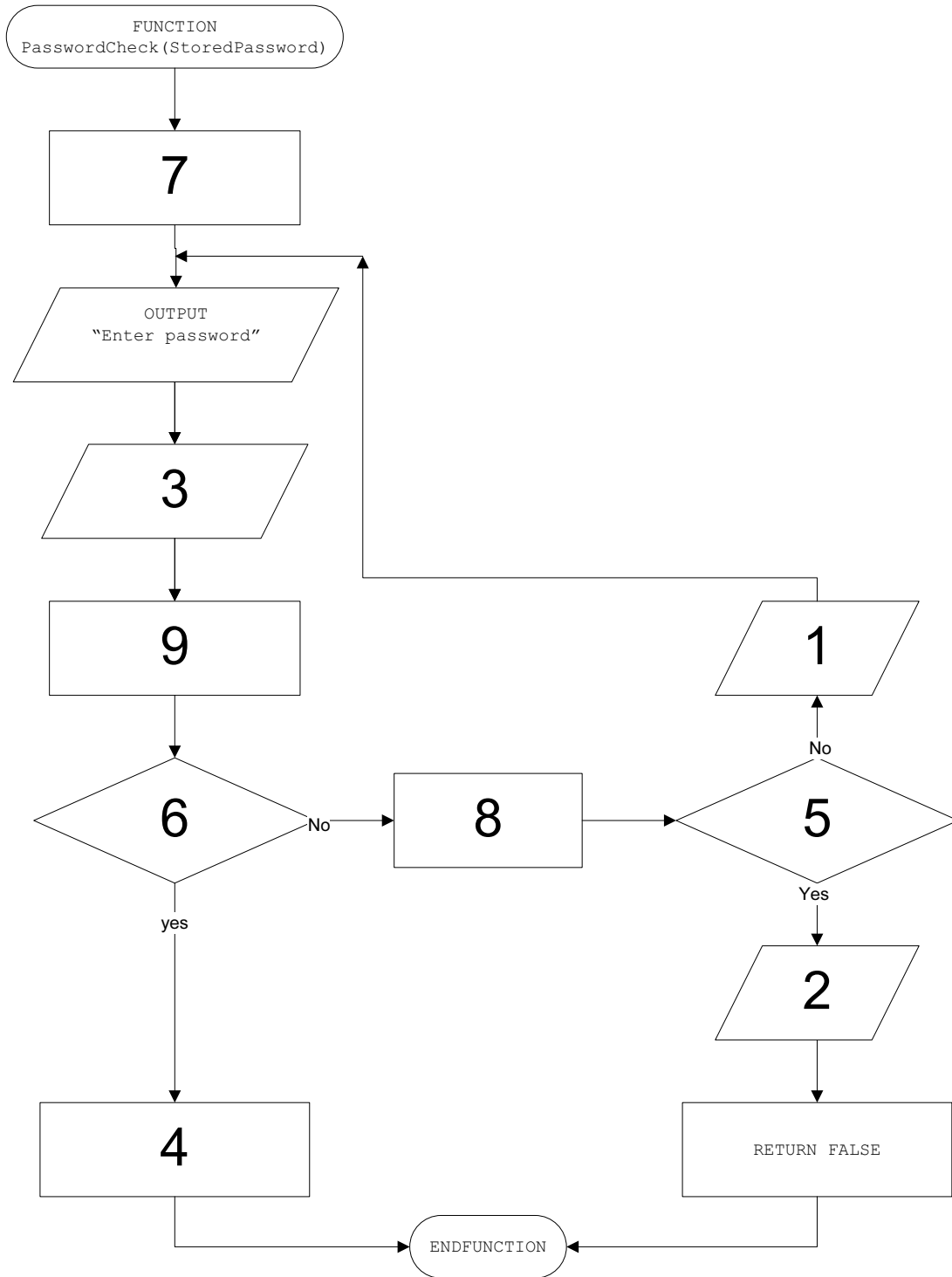
[9]

- (e) (i) – indentation
– meaningful identifiers
– initialising variables
– annotation
– parameters
– capitalisation of keywords
– modular structure
- (ii) – declaring variables/constants
– local variables

[3]

[1]

2 (a)



[9]

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```

(b) FUNCTION FindPassword(ThisUserID : STRING) RETURNS STRING
                                // 1 mark
    DECLARE Found : BOOLEAN
    OPENFILE FOR INPUT
    Found ← FALSE
    WHILE NOT EOF AND Found = FALSE // 2 marks
        FILEREAD next record
        IF UserID = ThisUserID // 1 mark
            THEN
                Found ← TRUE // 1 mark
        ENDIF
    ENDWHILE
    IF Found = TRUE // 1 mark
        THEN
            RETURN EncryptedPassword // 1 mark
        ELSE
            RETURN Error code // 1 mark
        ENDIF
    CLOSEFILE
    ENDFUNCTION

```

[8]

Alternative part:

```

    IF Found = False // 1 mark
        THEN
            RETURN Error code // 1 mark
        ELSE
            RETURN EncryptedPassword // 1 mark
        ENDIF

```

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- 3 (a) (i) Mark as follows:
1 mark for a heading
1 mark for input boxes with units
1 mark for text output box with description
1 mark for button “calculate” or similar
Accept console mode design [4]
- (ii) 1 mark for explanation that fits design of (a)(i). [1]
- (b) (RoomWidth >=100) AND (RoomWidth < 1000)
1 mark for each bracketed part
1 mark for AND [3]
- (c) (i) 3 [1]
- (ii) RoomWidth MOD 30 > 0 // RoomWidth MOD 30 != 0 [1]
- (iii) e.g. Pascal
- ```
TilesForWidth := RoomWidth DIV 30;
IF RoomWidth MOD 30 > 0
 THEN TilesForWidth := TilesForWidth + 1;
TilesForLength := RoomLength DIV 30;
IF RoomLength MOD 30 > 0
 THEN TilesForLength := TilesForLength + 1;
TilesRequired := TilesForWidth * TilesForLength * 1.1; // +10%
```
- 1 mark for calculating tiles for length*  
*1 mark for calculating tiles for width*  
*1 mark for rounding up when needed*  
*1 mark for multiplying TilesForWidth and TilesForLength*  
*1 mark for adding 10% of total tiles required* [5]

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4 (a) (i) for example: 0 & -1 // TRUE & FALSE // 'O' & 'X' [1]

(ii) e.g. Pascal

```

VAR FloorDesign: ARRAY[1..35, 1..35] OF CHAR; // 2 marks
(1 mark for correct dimensions, 1 mark for data type to match assignment below)
FOR i := 1 TO 35 DO // 1 mark
 FOR j := 1 TO 35 DO // 1 mark
 FloorDesign[i,j] := 'O'; // 1 mark

```

[5]

```

(b) NumberOfWhiteTiles ← 0
NumberOfColourTiles ← 0
FOR a ← 1 TO 15
 FOR b ← 1 TO 10
 IF FloorDesign[a,b] = 'X'
 THEN
 NumberOfColourTiles ← NumberOfColourTiles + 1
 ELSE
 NumberOfWhiteTiles ← NumberOfWhiteTiles + 1
 ENDIF
 ENDFOR
ENDFOR

```

Mark as follows:

*1 mark for initialisation*

*1 mark for loops with correct ranges*

*1 mark for correct nesting*

*1 mark for testing array element*

*1 mark for updating count of coloured tiles*

*1 mark for calculating number of white tiles (counting or subtracting)*

[6]

5 (a)

| a  | x   | a >= x       |
|----|-----|--------------|
| 13 |     |              |
|    | 8   |              |
|    |     | <b>TRUE</b>  |
| 5  |     |              |
|    | 4   |              |
|    |     | <b>TRUE</b>  |
| 1  |     |              |
|    | 2   |              |
|    |     | <b>FALSE</b> |
|    | 1   |              |
|    |     | <b>TRUE</b>  |
| 0  |     |              |
|    | 0.5 |              |

Output: 1 1 0 1

1 mark for each correct column

1 mark for correct output, in this order.

[4]

(b) converts denary number to binary // converts 13 to binary

[1]