

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Pearson BTEC Level 3
Nationals Extended
Certificate, Foundation
Diploma, Diploma,
Extended Diploma

Centre Number

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Learner Registration Number

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Friday 18 January 2019

Afternoon (Time: 2 hours)

Paper Reference **31768H**

Computing

Unit 1: Principles of Computer Science

You must have:

Information Booklet (enclosed)

Total Marks

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Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and learner registration number.
- Answer **all** questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*

Information

- The total mark for this paper is 90.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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Pearson

Answer ALL questions. Write your answers in the spaces provided.

Please refer to the Information Booklet in order to answer Question 1.

1 Jonty is a window cleaner. He would like a program to help manage his business.

Figure 1 in Section 1 of the Information Booklet shows some sample data about his customers.

(a) State **three** reasons why 'Telephone Number' would be a string data type instead of an integer.

(3)

Reason 1:

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Reason 2:

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Reason 3:

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Jonty would like to offer customers over the age of 65 a 25% discount.

(b) Explain why Jonty would store a customer's date of birth rather than storing their age.

(2)

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(c) Jonty would like to give each customer a status depending on the number of missing payments.

A customer's status is set to "Continue" when they have fewer than two missing payments. Otherwise the status is set to "Stop".

Complete this algorithm so that it meets these rules.

(2)

BEGIN

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ELSE

status = "Stop"

ENDIF

END

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Jonty will use functions in his programming code.

(d) Describe the difference between **declaring** a function and **calling** a function.

(4)

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(e) Explain **one** benefit of using functions when creating program code.

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(Total for Question 1 = 22 marks)



2 Curtis would like to lead a healthier lifestyle. He would like a program to monitor how much time he spends exercising each day.

(a) The program code will contain different procedures.

Explain what is meant by the term 'procedure' when creating program code.

(3)

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(b) Curtis will use a password to access his program. He has written an algorithm to compare a stored password with a user input. This is written in pseudocode.

```
BEGIN  
storedPassword = ComputerScience1#  
INPUT enteredPassword  
FOR count = 1 TO 3  
    IF storedPassword = enteredPassword THEN  
        BREAK  
    ELSE  
        INPUT enteredPassword  
    ENDIF  
NEXT count  
ENDFOR  
END
```

Explain the relationship between the **FOR** loop and **BREAK** statement in the pseudocode.

(4)

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(c) Curtis would like to expand his program to make sure a new password is a minimum length.

The rules for the algorithm are:

1. check the password is at least eight characters long
2. only continue if the password is of the correct length
3. when the password is the correct length print "Accepted".

Develop an algorithm that meets the given rules.

Write your answer using pseudocode.

(4)

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Curtis has recorded the number of minutes he has exercised each day over a seven-day period.

He wants to sort this data into order from lowest to highest. He will use a standard sorting algorithm.

- (d) Demonstrate how a **quick sort** can put the data in order from the lowest number to the highest number.

Use the **left-most value** for the pivots.

(5)

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You should continue your quick sort on the next page.

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Curtis could use a bubble sort to put the data in order from the lowest number to the highest number.

The exercise times are shown again here for your reference.

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(e) Describe how a bubble sort would use **loops** to sort the exercise times into order. (4)

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Please refer to Section 2 of the Information Booklet in order to answer Questions 3(b) and 3(c).

3 Theo owns a restaurant. He would like a program to manage his table bookings. The programming code will be written using an object-oriented programming language.

(a) Explain what is meant by the term 'encapsulation' when creating program code.

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Four sets of horizontal dotted lines for writing, each set consisting of a solid top line, a dotted middle line, and a solid bottom line.



(c) **Figure 2b** shows the plan of Theo's restaurant and the rules that are followed to find a table.

Theo will structure his code using a combination of sequence, conditional and iterative control structures.

Analyse how Theo could use these control structures in his program code to meet the rules given in **Figure 2b**.

(10)

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(Total for Question 3 = 22 marks)



(c) Evaluate the extent to which the algorithm meets the algorithm rules.

Your evaluation should cover the effectiveness and accuracy of the algorithm.

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(Total for Question 4 = 26 marks)

TOTAL FOR PAPER = 90 MARKS



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