T-LEVELS | Institute for Apprenticeships & Technical Education

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Candidate surname	Other names

Centre Number | | | | | | |

LL- | | | | | | | | | | |

Learner ID

T Level Technical Qualification in Digital Production, Design and Development (Level 3)

Time 2 hours 30 minutes

Paper reference **19536**

Core

PAPER 1: Digital Analysis, Legislation and Emerging Issues

You do not need any other materials.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and Pearson learner ID.
- There are two sections in this question paper. Answer **all** questions in Section A and Section B.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*

Information

- The total mark for this paper is 100.
- The marks for **each** question are shown in brackets
  – *use this as a guide 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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P 7 1 4 8 5 A 0 1 2 4

Pearson

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

SECTION A

1 A lift control unit will show a red light if either of these conditions are true:

- the weight of the lift is 1000 kg or more
- the door is open.

Write pseudocode that will implement the logic for the lift control unit.

(Total for Question 1 = 4 marks)

2 **Figure 1** shows a section of Python code.

```
 1 PI=3.14
 2
 3 def calc_area(r):
 4     a = PI*r*r
 5     print("Area is", a)
 6
 7
 8 r=input("Input radius of circle")
 9 r=int(r)
10 calc_area(r)
11
```

Figure 1

(a) Identify **one** constant used in the program shown in **Figure 1**.

(1)

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(b) Identify **one** local variable used in the program shown in **Figure 1**.

(1)

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(c) Explain the purpose of line 9.

(2)

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(Total for Question 2 = 4 marks)

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3 A program needs to output data to a text file.

Describe how the program would open the text file so data can be written to it.

(Total for Question 3 = 3 marks)

4 Describe how abstraction is used when designing software.

(Total for Question 4 = 4 marks)

5 Explain **one** possible health risk that can be caused by working with computers for long periods of time.

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(Total for Question 5 = 3 marks)

6 (a) Explain why it is important to develop robust code.

(3)

(b) Explain **two** features of an effective test plan.

(4)

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2 .....

(Total for Question 6 = 7 marks)

7 A program is required to calculate the value of a gift voucher to be rewarded to bookshop customers.

There are three voucher values.

If a customer buys 10 books or more then that customer will be given a £15 voucher.

If a customer buys 5 books with a value of more than £50 then that customer will be given a £5 voucher.

All other customers will be given a £1 voucher.

The program must:

- allow the user to enter the number of books bought
- check that a positive number has been entered
- allow the user to enter the total value of the order
- check that a positive number has been entered
- calculate the voucher value
- output the voucher value.

Draw a flow chart that meets the rules of the algorithm.

Use the space on page 9 to draw your flow chart.

(6)

(Total for Question 7 = 6 marks)

8 Evaluate the role of the Computer Misuse Act in securing data held on computer systems.

(9)

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(Total for Question 8 = 9 marks)

TOTAL FOR SECTION A = 40 MARKS

SECTION B

9 Dowsim Dentists is a dental practice. Its patients are a mixture of private and NHS patients.

Patient information is stored in a list called *Patients*.

There are currently 2000 patients. Each patient has a unique patient number between 1 and 2000.

Figure 2 shows a selection of data held in *Patients*.

Patient Number	Name	Missing Teeth	Fillings	Private Patient	Risk Score	Emergency Appointment
174	Carol Taylor	0	11	Y		
203	Janet Williams	1	2	Y		
365	Annette Lloyd	3	7	N		
1010	Nia Morgan	0	3	N		
1987	Arifa Lala	0	0	N		
1999	Saul Cohen	6	10	Y		

Figure 2

(a) After each check-up the risk score for that patient is calculated.

For each missing tooth the risk score is 5.

For each filling the risk score is 2.

Private patients who have an overall risk score of more than 15 should have the emergency appointment field set to true.

Develop a section of pseudocode that will update the emergency appointment field for each patient.

(6)

(b) The dental practice wants customers to complete a customer satisfaction survey.

It will select a random sample of customers using their patient number.

Explain **two** reasons why the dental practice would make use of pre-existing Python functions to generate a random series of patient numbers.

(4)

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(c) The dental practice manager is concerned about a member of office staff.

Discuss how the manager could make use of observational techniques to raise situational awareness.

(6)

(Total for Question 9 = 16 marks)

10 DwrEnergy is an energy company. It supplies gas and electricity to customers all over the UK. Many of the customers have installed charging points for electric vehicles.

(a) DwrEnergy is developing a mobile phone app that will allow its customers to provide meter readings.

Two items of data that must be entered are:

- current meter reading, which must be a positive number
- customer code, which is 8 characters long and can contain a mixture of letters and digits.

The app will use a format check to ensure that the customer code only contains letters or digits so would reject data that contains other characters such as '@'.

Explain **two other** validation techniques that can be used to validate the items of data.

(6)

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(b) A developer is designing an algorithm that will decide on the price per unit of electricity for each customer.

If the number of units used is greater than a given value then one price plan is used, otherwise a higher price plan is used.

Describe how a selection structure could be used in this algorithm.

(4)

(c) DwrEnergy thinks that many of its customers wish to purchase self-driving cars (autonomous vehicles).

Evaluate the moral and ethical implications of the increased use of self-driving cars.

(9)

(Total for Question 10 = 19 marks)

11 A new system is being developed for a school library.

(a) The developers wish to use a bottom-up design method to design the new system.

Explain **two** benefits to the developers of using bottom-up design.

(4)

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(b) One of the developers is writing an algorithm.

Describe how a flow chart could be used when writing the algorithm.

(3)

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(c) During testing the developers use root cause analysis.

Describe how root cause analysis is used to solve problems.

(4)

(d) Explain **one** way the developers can use an accepted style convention, such as Python's PEP 8, to create readable code.

(2)

(e) One part of the code must check all loans to find books that are overdue.

This section of code will make use of iteration.

Evaluate the use of For and While loops to implement iteration for this task.

(12)

(Total for Question 11 = 25 marks)

TOTAL FOR SECTION B = 60 MARKS
TOTAL FOR PAPER = 100 MARKS

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