T-LEVELS | Institute for Apprenticeships & Technical Education

Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | Learner ID

LL-

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

Tuesday 9 May 2023

Morning (Time: 2 hours 30 minutes)

Paper reference **19536**

Core: Examination

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 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

SECTION A

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

1 An energy company uses an algorithm to decide on the daily charge for a customer.

Figure 1 shows the algorithm used.

```
IF (CustomerType <> DualUse) THEN
    SET DailyCharge TO 2
ELSE
    IF (CustomerType == DualUse) AND (UnitsUsed > 2000) THEN
        SET DailyCharge TO 1
    ELSE
        SET DailyCharge TO 1.5
    END IF
END IF
```

Figure 1

Complete the table to show the DailyCharge for these customers.

CustomerType	UnitsUsed	DailyCharge
SingleUse	1400	
DualUse	3000	
DualUse	1800	
SingleUse	2400	

(Total for Question 1 = 4 marks)

2 A driving school wants to store details about its learner drivers. Two variables stored about each learner are:

- Mobile_Phone_Number
- Number_Of_Lessons_Taken

(a) Explain the most appropriate data type for **each** variable.

(4)

Mobile_Phone_Number

Number_Of_Lessons_Taken

(b) Describe how a suitable validation technique could be used to validate data entered into the *Mobile_Phone_Number* field.

(3)

(Total for Question 2 = 7 marks)

3 State **two** observational techniques that can be used to inform situational awareness.

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2 .....

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(Total for Question 3 = 2 marks)

4 Explain **two** reasons why a company might decide to use open-source software.

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2 .....

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(Total for Question 4 = 4 marks)

5 (a) Explain what is meant by the term 'algorithm'.

(2)

(b) Explain why a developer would choose to express an algorithm as pseudocode.

(3)

(c) Describe how a number held in a variable can be tested to see if it is an odd number.

(3)

(Total for Question 5 = 8 marks)

6 A college charges students to use its printers. The rules used to calculate the charge are:

- Black and white pages are charged at 2p per page
- Colour pages are charged at 7p per page
- There is a maximum charge of 50p.

The algorithm for charging students is:

a. Allow the user to input the number of pages printed.
b. Check that the number input is positive.
c. Allow the user to input if the pages are in colour.
d. Calculate the total cost.
e. Output the total cost.

Draw a flowchart that meets the rules of the program.

(Total for Question 6 = 6 marks)

7 Evaluate the effectiveness of using problem decomposition when developing new digital systems.

(9)

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(Total for Question 7 = 9 marks)

TOTAL FOR SECTION A = 40 MARKS

SECTION B

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

8 A new app to control growing conditions in food production systems is being developed.

(a) One of the features in this system will be to analyse the rainfall over a period of 100 days.

The rainfall measurements for the last 100 days are stored in a list called **Rain**.

Part of this list is shown in **Figure 2**.

Index	0	1	2	3	…	98	99
Rainfall	12	17	0	2	…	8	17

Figure 2

The rules for analysing the rainfall are:

- Calculate average rainfall for the last 100 days.
- Compare each day's rainfall with the average.
- Calculate the total number of days where the rainfall was above average.
- Output the total number of days with above average rainfall.

Develop a section of pseudocode that will calculate and output the number of days with above average rainfall.

(6)

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(b) Explain why it is important that the code being developed is robust and reliable.

(4)

Robust

Reliable

(c) Discuss the environmental impact of using digital technologies such as the new app.

(6)

(Total for Question 8 = 16 marks)

9 A company offers a food delivery service. This service allows customers to order food items using an app and to get the items delivered to their home by a delivery driver.

(a) The company wants to update its ordering app to include more food choices.

Figure 3 shows the types of food available to order from the app. This data is held in a Python list.

```
food_types = ['Indian', 'Italian', 'Chinese', 'Desserts']
```

Figure 3

(i) Write a line of Python code that adds 'Drinks' to the **end** of the list.

(2)

(ii) Write a line of Python code that uses a built-in function to return the number of items in the list.

(2)

(b) Explain why the developers of the app have used data structures to store data in their code.

(4)

(c) Describe how the Internet of Things (IoT) can be used in this application.

(2)

(d) The app will store personal and financial data about customers.

The company must follow data protection laws to protect customer privacy.

Evaluate the impact that these data protection laws will have on the company.

(9)

(Total for Question 9 = 19 marks)

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10 *CerddCampus* is a company that offers music lessons.

Lessons are available for a wide variety of instruments and are available in-person or remotely. The company employs many part-time teachers, and each teacher specialises in one instrument only.

The company wishes to develop a digital system that will allow learners to book lessons.

(a) Explain **two** items of data that would have to be input when a learner books a lesson with a teacher.

(4)

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(b) Describe **two** ways the system could be tested during development.

(4)

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(c) Web Content Accessibility Guidelines (WCAG) provide recommendations for making web content more accessible.

State **two** design principles defined by WCAG.

(2)

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2 .....

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(d) Explain why using an accepted style convention, such as PEP 8, helps the developers to write maintainable code.

(3)

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(e) The digital system is being developed by a team of programmers.

Evaluate the benefits and drawbacks of using local and global variables when developing this system. Your evaluation should include a supported conclusion.

(12)

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(Total for Question 10 = 25 marks)

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

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