

Please check the examination details below before entering your candidate information

Candidate surname					Other names				
Centre Number					Candidate Number				

Pearson Edexcel Level 1/Level 2 GCSE (9–1)

Monday 12 May 2025

Afternoon (Time: 1 hour 30 minutes)

Paper reference **1CP2/01**

Computer Science

PAPER 1: Principles of Computer Science

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 candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*
- You are not allowed to use a calculator.

Information

- The total mark for this paper is 75.
- 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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Answer ALL questions. Write your answers in the spaces provided.

Some questions must be answered with a cross ☐. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☐.

1 Data

(a) Binary patterns consist of groups of bits.

(i) Identify the largest unit of measurement.

(1)

- ☐ **A** Gibibyte
☐ **B** Kibibyte
☐ **C** Mebibyte
☐ **D** Nibble

(ii) State the number of unique values that can be represented with 7 bits.

(1)

(iii) The denary ASCII code for **D** is 68.

Give the denary ASCII code for **G**.

(1)

(b) Hexadecimal is used to represent memory addresses.

(i) Give **two** characteristics of hexadecimal notation.

(2)

1

2



- (ii) Explain **one** reason why programmers use hexadecimal to specify memory addresses.

(2)

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- (c) Audio and image files store data in binary.

- (i) Explain **one** reason why lossy compression is used to reduce the size of an audio file.

(2)

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- (ii) An image is 315 pixels wide, 923 pixels high and has a colour depth of 7 bits.

Complete the expression to show the minimum file size in bytes.

You do not have to do the calculation.

(3)

.....	×		×	
.....				



(d) Computer systems manipulate bit patterns.

(i) Identify the result of applying an arithmetic shift right by two to the binary pattern 0110 1100

(1)

- ☐ **A** 0001 1100
- ☐ **B** 1101 1000
- ☐ **C** 0001 1011
- ☐ **D** 1011 0000

(ii) Convert the denary number 25 to 8-bit binary.

(2)

(iii) Convert the denary number –13 to 8-bit binary using two's complement.

(2)

(Total for Question 1 = 17 marks)

2 Computers

(a) A washing machine uses many different embedded systems to wash clothes.



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Give **two** functions embedded systems perform in a washing machine.

(2)

- 1
- 2

(b) Computers use different types of storage.

(i) Non-volatile storage keeps its content when the power is turned off.

Give **one other** reason why computers use non-volatile storage.

(1)

(ii) State the type of secondary storage media that stores data as a sequence of pits and lands.

(1)

(c) Programmers write code.

(i) Describe how an interpreter translates high-level code.

(2)

(ii) Assembly language is a low-level programming language.

Give **two** characteristics of assembly language.

(2)

1

2



(iii) Software development teams use different methods to produce robust code.

Name the method that records code changes, who made them and when.

(1)

(d) One role of the operating system is to allocate memory to processes.

Describe how the operating system makes use of virtual memory when there is a shortage of main memory.

(2)

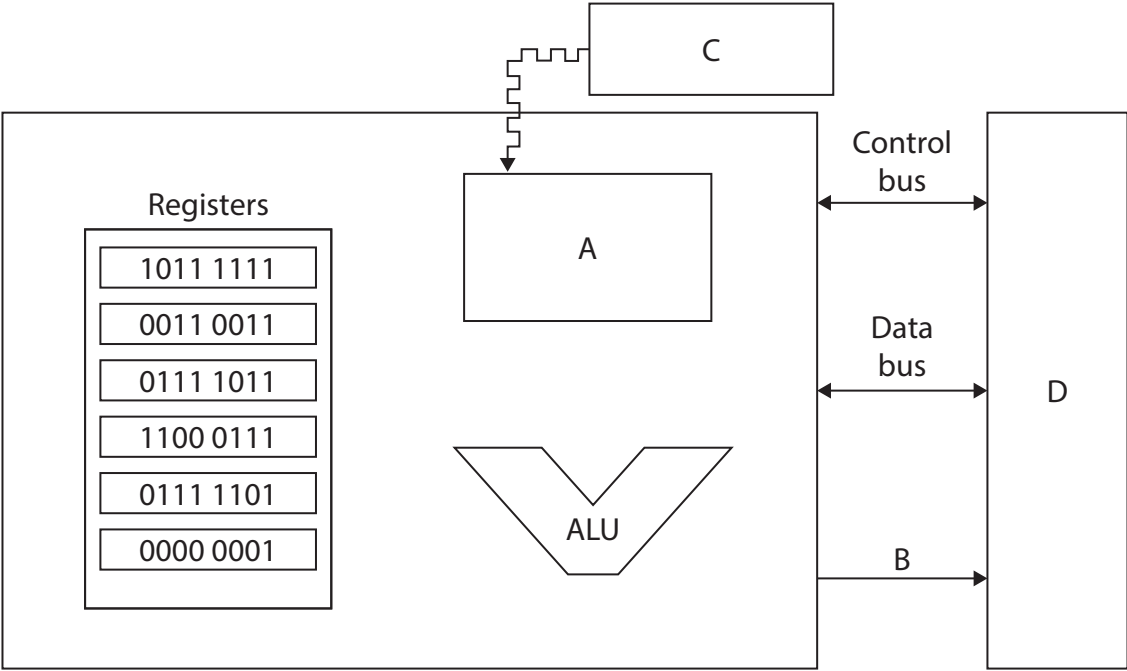
(e) File repair is a type of utility software.

Explain **one** reason why file repair software is needed.

(2)



(f) Here is a diagram of a central processing unit.



Complete the table with the name for the labelled components.

(4)

Label	Component
A	
B	
C	
D	

(Total for Question 2 = 17 marks)



3 Issues and impact

(a) Information is protected legally in several ways.

- (i) Identify the law that is broken when a person gains unauthorised access to a computer system.

(1)

- ☐ **A** Computer misuse
- ☐ **B** Consent
- ☐ **C** Copyright
- ☐ **D** Intellectual property

- (ii) One principle of data protection legislation is that data must be processed lawfully, fairly and in a transparent manner.

Give **three other** principles of data protection legislation.

(3)

1

.....

.....

2

.....

.....

3

.....

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- (b) Software licensed as open-source can be used free of charge.

Give **one other** characteristic of open-source software licensing.

(1)

.....

.....

.....

.....



(c) Cyber security protects computer systems from harm.

- (i) Explain **one** reason why an acceptable use policy keeps computer systems secure.

(2)

- (ii) Identify the type of malware that attaches itself to other files.

(1)

- ☐ **A** Keylogger
- ☐ **B** Trojan
- ☐ **C** Virus
- ☐ **D** Worm

(Total for Question 3 = 8 marks)

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4 Networks

- (a) A business has one office in New York and one in London.

State the type of network needed to connect the two offices.

(1)

- (b) Network protocols govern how data is transmitted between devices.

Complete the table with the network protocol for **each** description.

(3)

Description	Network protocol
Allows two computers to establish a connection across a network	
Allows connection to a network using radio waves	
Allows upload and download of files across a network	

- (c) Describe the role of an ethical hacker in network security.

(3)

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(6)

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(Total for Question 4 = 13 marks)



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5 Computational thinking

(a) Here is a partially completed truth table.

The logical expression for **Q** is complete.

Complete the truth table to give the:

- logical expression for **S**
- logical expression for **T**
- values for **Q**

(3)

A	B	C	S	T	Q
					NOT S AND T
0	0	0	0	0	
0	0	1	0	1	
0	1	0	0	1	
0	1	1	0	1	
1	0	0	0	0	
1	0	1	1	1	
1	1	0	0	1	
1	1	1	1	1	



(b) Here is an algorithm to process sales data.

```
1  # -----
2  #  Global variables
3  # -----
4
5  salesData = [[9, 6, 32],
6               [20, 12, 9],
7               [9, 8, 8],
8               [32, 24, 29],
9               [7, 20, 12],
10              [6, 9, 6]]
11 total = 0
12 currMax = 0
13
14 # -----
15 #  Main program
16 # -----
17 for sale in salesData:
18     total = 0
19     for item in sale:
20         total = total + item
21         if (item < currMax):
22             currMax = item
23     print (sale, total)
24 print (currMax)
25
```



- (i) The data structure `salesData` is shown as a table of records, with fields in each record.

Complete the table with the line number for each traversal.

(2)

	Line number
Traverses the records	
Traverses the fields	

- (ii) There is a logic error in the code.

Write the corrected line of code.

(1)

(c) Here is an algorithm.

```

1  # -----
2  #  Constants
3  # -----
4
5  NUM = 6
6
7  # -----
8  #  Global variables
9  # -----
10
11 total = 0
12
13 # -----
14 #  Main program
15 # -----
16
17 for number in range (1, NUM + 1):
18     remainder = NUM % number
19     if (remainder == 0):
20         total = total + number
21 print (total)
22

```

Complete the trace table.

You may not need to fill in all the rows in the table.

(4)

number	remainder	total	Output
		0	



(d) The efficiency of algorithms can be analysed.

The worst case is when the most comparisons are required.

The best case is when the fewest comparisons are required.

(i) Explain the worst case for a linear search on an array.

(2)

(ii) Explain the best case for a bubble sort on an array.

(2)

(e) A binary search algorithm looks for a target in a sorted array.

Here is an array of numbers.

Index	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
Value	11	22	33	44	55	66	77	88	99	100	101

Complete the table to show the steps of a binary search algorithm to look for the number **78**, which is not in the array.

You must show the calculation of the mid-point.

You may not need to fill in all the rows in the table.

(6)

Start index	End index	Calculation of mid-point	Found Y or N	Discard lower, higher or none

(Total for Question 5 = 20 marks)

TOTAL FOR PAPER = 75 MARKS



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