Please check the examination details below before entering your candidate information

Candidate surname	Other names

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

Centre Number | | | | | |

Candidate Number | | | | |

Specimen Assessment Material for first teaching
September 2020

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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S 6 8 6 2 2 A 0 1 2 0

Pearson

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

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

1 Issues and impact

(a) State **two** methods of protecting intellectual property.

(2)

1 .....

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2 .....

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(b) Identify the ethical issue associated with the use of artificial intelligence.

(1)

☒ **A** Acceptable use policies

☒ **B** Algorithmic bias

☒ **C** Logic errors

☒ **D** Unpatched software

(c) State **one** way **users** could reduce the environmental impact of digital technology.

(1)

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(d) Explain **one** reason why an employee who is logged on to the company network should not click on a link in an email from an unknown source.

(2)

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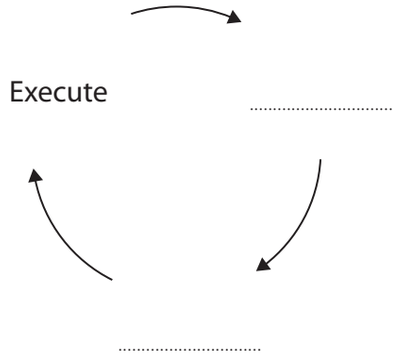
(Total for Question 1 = 6 marks)

2 Computers

(a) The CPU carries out a process.

(i) Complete the diagram.

(2)



(ii) Identify the hardware component that carries instructions from memory to the CPU.

(1)

☒ **A** Binary shift

☒ **B** Control unit

☒ **C** Data bus

☒ **D** Register

(iii) State the component of the CPU that carries out additions and comparisons.

(1)

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(iv) State the reason why a higher clock speed is desirable.

(1)

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(v) State the name of a bus that is unidirectional.

(1)

.....

(b) Describe how data is stored on magnetic media.

(2)

(c) State the type of secondary storage that uses a laser to read the disk.

(1)

(d) Some program code requires translation.

Define the term 'translation'.

(1)

(e) Describe **two** ways a compiler differs from an interpreter.

(4)

1

2

(f) Describe **two** ways an operating system manages processes.

(4)

1 .....

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2 .....

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(g) Describe how an embedded system that uses a sensor could control car windscreen wipers.

(2)

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(Total for Question 2 = 20 marks)

3 Computational thinking

(a) Define the term 'decomposition'.

(1)

(b) State the worst case for a linear search algorithm.

(1)

(c) A bubble sort is carried out on this list to put it in ascending order.

8 3 2 4 0 3 9

The value '8' starts in position 0.

(i) State the number of passes required to complete the sort.

(1)

(ii) State the number of swaps made on the final pass.

(1)

(iii) State the component of an algorithm used to store whether a swap has been made during a pass.

(1)

(iv) State the position of the item that will be compared with the value in position 0.

(1)

(v) Define the term 'iteration'.

(1)

(d) Explain **one** benefit of using subprograms.

(2)

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(e) Complete this truth table.

(3)

A	B	C	(A AND B)	(NOT C)	(A AND B) OR (NOT C)
0	0	0			
0	0	1			
0	1	0			
0	1	1			
1	0	0			
1	0	1			
1	1	0			
1	1	1			

(f) The identifier `plants` is used for an array of values.

`len(plants) // 2` is used to find the index position of the middle item in `plants`

Explain **one** reason why integer division, rather than division, is used to do this.

(2)

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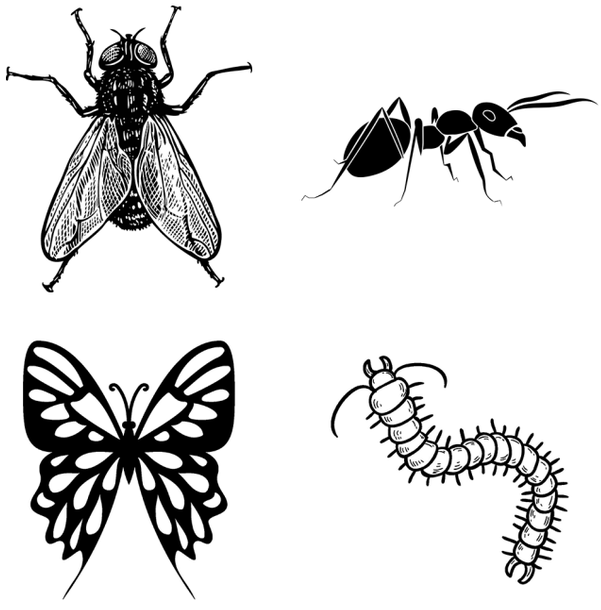
(g) Here are four images of creatures that will be used in a computer game.



(Source: images from © PAL)

Before coding the game, a programmer applies abstraction.

One feature of creatures is their colour.

State **two other** features of the creatures that the programmer could include when creating a general model for a creature.

(2)

1 .....

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2 .....

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(Total for Question 3 = 16 marks)

4 Data

(a) Identify the result of a single logical shift left on the 8-bit binary pattern 0101 0101.

(1)

- ☒ **A** Addition
- ☒ **B** Division
- ☒ **C** Multiplication
- ☒ **D** Subtraction

(b) Convert the denary number –33 to 8-bit binary using two's complement.

(2)

(c) Complete the table to show the result of 1001 0110 + 0101 0001

(2)

1	0	0	1	0	1	1	0
0	1	0	1	0	0	0	1

(d) Convert the hexadecimal number 2A to 8-bit binary.

(2)

(e) Images can be represented as bitmaps.

(i) Define the term 'pixel'.

(1)

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(ii) Describe **one** way that changing the number of bits allocated to the colour depth determines how an image is represented.

(2)

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(f) Analogue sound must be converted into a digital representation.

(i) State the name for the height of a sound wave.

(1)

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(ii) State **one** benefit and **one** drawback of increasing the bit depth of audio.

(2)

Benefit .....

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Drawback .....

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(g) A company is designing promotional products for a band. Products include CDs, toys, greeting cards and digital downloads. All the products use sound.

Discuss the choice of lossless or lossy compression for sound in these products.

Your answer should consider:

- the types of product
- lossless compression
- lossy compression.

(6)

(Total for Question 4 = 19 marks)

5 Networks

(a) Identify the reason why all computers need a unique IP address.

(1)

- ☒ **A** Enables a firewall to protect devices
- ☒ **B** Identifies devices on a network
- ☒ **C** Increases the speed of transmission
- ☒ **D** Reduces reliance on the transport layer

(b) Describe **one** disadvantage of using a bus topology.

(2)

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(c) A company stores statistics about its business on a server.

Explain **one** type of access to the statistics file a student on work experience at the company should be given.

(2)

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(d) Construct an expression to calculate the minimum transmission rate required to transmit a 250 MiB file in exactly one hour.

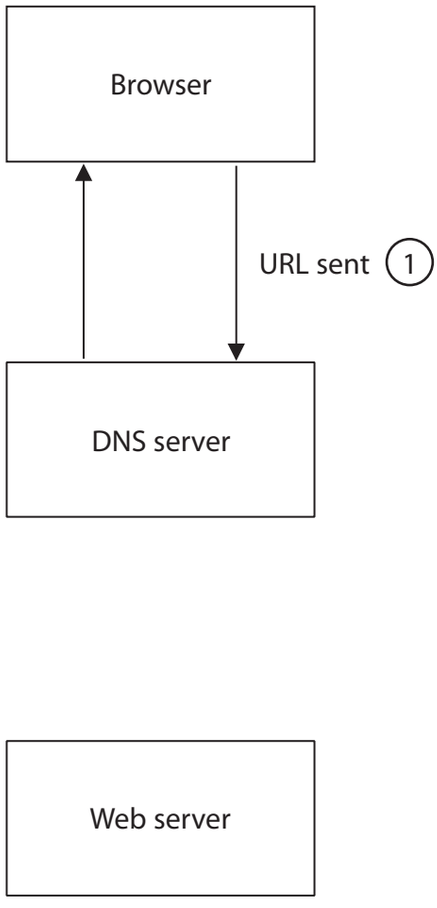
There are 3600 seconds in an hour.

(3)

(e) Complete the diagram to show the processes used to find the IP address of a web server and download a page.

Include labels, arrows and numbers in your diagram to show the order in which processes are carried out.

(6)



(Total for Question 5 = 14 marks)

TOTAL FOR PAPER = 75 MARKS

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