

Write your name here

Surname

Other names

Pearson Edexcel
Level 1/Level 2 GCSE

Centre Number

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Candidate Number

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Computer Science

Paper 1: Principles of Computer Science

Specimen Paper

Time: 1 hour 40 minutes

Paper Reference

1CP1/01

You will need:

Booklet containing pseudo commands

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.*

Information

- The total mark for this paper is 80.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*
- You are not allowed to use a calculator.

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 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** Computer systems run software programs. The programs provide the instructions needed for the computer to handle the input, processing and output of data.

(a) Identify the type of software used to imitate a real world situation.

(1)

- ☐ **A** Applications software
- ☐ **B** Simulation software
- ☐ **C** Utility software
- ☐ **D** Systems software

(b) State the type of memory used to store a computer's start up program.

(1)

(c) Identify the component of the CPU that holds the current program instruction.

(1)

- ☐ **A** Control unit (CU)
- ☐ **B** Register
- ☐ **C** Arithmetic logic unit (ALU)
- ☐ **D** Data bus

(d) Describe the concept of a stored program.

(2)

(e) An operating system is the software that provides the interface between a user and a computer system.

(4)

(f) Truth tables are used to show how digital output relates to input.

(1)

(Total for Question 1 = 10 marks)

2 Jane operates a vintage clothing business from a converted warehouse.

She has decided to start an online shop for her products. She needs a local area network with Internet access.

(a) State the type of organisation Jane will have to pay to access the Internet.

(1)

(b) Describe the topology of a star network.

(2)

(c) Jane has decided to provide her warehouse staff with tablet computers and to install a wireless network in her warehouse. The network will include a wireless access point and router.

Describe the roles of the wireless access point and router on Jane's network.

(4)

(d) Staff use a stock control system to check stock availability. The system uses a binary search algorithm.

Here is an ordered list of shoe codes. The target value is 2.

Give the sequence of values visited to find the target value using a binary search.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
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(3)

(Total for Question 2 = 10 marks)

3 A landscape photographer wishes to publish a series of preview images online. He is concerned about file sizes.

(a) The 24-bit RGB images are to be displayed on screen at a resolution of 400 x 250 pixels.

Construct an expression to calculate the size of one of the image files (KB). You do not need to carry out the calculation.

(3)

(b) Higher resolution versions of the images are available for download as JPEG files.

Explain the effects of using the JPEG compression format for the images.

(2)

(c) The images are to be displayed with a background of hex colour code BB4A0F.

Convert the background hex code into a binary number.

(2)

(d) Explain why hexadecimal notation is preferred to binary notation when specifying screen colours.

(2)

(Total for Question 3 = 9 marks)

4 Binary strings can be used to represent numbers, text, and images.

(a) Identify the binary system used to represent text.

(1)

- ☐ **A** IMAP
- ☐ **B** URL
- ☐ **C** ASCII
- ☐ **D** RLE

(b) Explain the concept of overflow in relation to binary addition.

(2)

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(c) Complete the table to calculate adding 12 in denary to -11 in denary using 8-bit notation and two's complement.

(3)

								12
								-11
								Answer

(d) Describe the result of carrying out an arithmetic shift right, one place, to an 8-bit binary integer.

(2)

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- (e) Here is some data used to represent an image. Each pixel is encoded as a character.

AADACCEFABAAECFGBDGE

Explain why a run-length encoding algorithm may not be appropriate for encoding this image.

(2)

(Total for Question 4 = 10 marks)

5 Forhad is new to programming. He wants to develop an app for his online music business.

(a) Forhad's source code will need to be translated.

(i) Identify the purpose of program translation.

(1)

(ii) Identify a method of translation Forhad could use during development of the app.

(1)

(b) Forhad has decided to develop the app using a high-level programming language.

Give **two** reasons for this decision.

(4)

1

2

6 Southlands Hotel and Spa uses a booking system to record details of room bookings.

(a) The booking system runs on a client-server network.

(i) Describe the role of a client workstation.

(2)

(ii) Identify **one** alternative usage model to a client-server network, where all workstations have equal status.

(1)

(b) Southlands Hotel and Spa keeps backups of its customer and booking files on a solid state disc.

Explain how data is stored on a solid state disc.

(3)

- (c) The workstations used at the hotel are old and are starting to run slowly when searching the files.

The hotel is considering two specifications for replacement workstations.

Specification 1: 3 GHz, 64-bit CPU, with 4MB cache and 8 GB RAM.

Specification 2: 4 GHz, 64-bit CPU, with 4MB cache and 4 GB RAM.

Compare the performance likely to be provided by the two specifications.

(6)

(Total for Question 6 = 12 marks)

- 7 (a) One of the main concerns when connecting devices to a network is security.

HTTP is an Internet protocol.

Explain the purpose of HTTP.

(2)

- (b) HTTPS is a version of HTTP with increased protection against cyberattacks.

- (i) Identify the type of cyberattack from which HTTPS offers some protection.

(1)

- ☐ **A** Phishing emails
- ☐ **B** Unpatched software
- ☐ **C** Denial of service
- ☐ **D** Eavesdropping

- (ii) Explain how HTTPS provides increased security.

(2)

(c) Describe the role of an ethical hacker.

(3)

(d) A school implements two-part user authentication as a network security measure.

State the names of these **two** parts.

(2)

1

2

(Total for Question 7 = 10 marks)

8 Protocols provide standards for network communications.

(a) Identify the protocol used to send email messages to an email server.

(1)

- ☐ **A** POP3
- ☐ **B** SMTP
- ☐ **C** FTP
- ☐ **D** IMAP

(b) Explain the role of Ethernet protocol.

(2)

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(c) Data can be transmitted in packets using layered protocol stacks.

Describe the TCP/IP model for data transmission.

(4)

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(Total for Question 8 = 7 marks)

TOTAL FOR PAPER = 80 MARKS