**PEARSON EDEXCEL INTERNATIONAL GCSE (9–1)**

# COMPUTER SCIENCE

**P** Pearson

## Unit 1 Problem solving
### 1 Understanding algorithms (Student book, pages 4–11)

**1** What is an algorithm?

    **a)** a computer program
    **b)** a detailed design for a solution
    **c)** an overview of a solution
    **d)** a flowchart representing a solution.

**2** Choose all the ways an algorithm can be represented:

    **a)** flowchart
    **b)** sketch
    **c)** written description
    **d)** pseudocode.

**3** What is the term for a container of data that stores a fixed value?

    **a)** constant
    **b)** variable
    **c)** quotient
    **d)** operator.

**4** What is pseudocode?

    **a)** a high-level programming language
    **b)** a type of flowchart
    **c)** a structured code-like language
    **d)** program code.

**5** Describe what a variable is.

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**6** When would you use a constant rather than a variable?

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**7** Why is it important that variable identifiers are descriptive?

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8 What flowchart symbol is used to indicate a decision?

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## Programming Activity 1
### Write a shopping list to a text file
(Unit 2 Programming: pages 73–80)

### Learning objectives
- Write code that accepts and responds appropriately to user input
- Write code that reads to and writes from a text file

### Assessment objectives
AO2, AO3

### Spec alignment
Page 12, Sections 2.4.1, 2.4.3

### Task
Write a pseudocode program to read in shopping list items one at a time from a user and then write to a text file.

### Misconceptions/barriers
Students need to understand that files can be read from, written to or appended to. Some students seem to struggle with the idea of what a text file is, and this could be remedied by using something like Notepad to explain what can and cannot be stored in a text file.

### Differentiation
Low ability:
- Students struggling with this task could break it down into two parts, getting the information and writing the information.
- Students could write a program that simply reads in the items from the keyboard and stores them in an array.
- The next step could be to output to the screen and then this could be modified to write to a file instead of the screen.

High ability:
- Students should create a program that asks if they want to read or write a shopping list.
- The user's response to this menu would result in items being read in from the user and stored in a text file or the text file being displayed on screen.
- Students could expand the above program to ask the user for a filename for the file to be read from or written to. This means that multiple shopping lists could be stored, such as food shopping or DIY items needed.
- Ask students to implement their pseudocode solution to the task in the programming language they are doing. After completing this, they can discuss with a partner what changes they had to make and why they needed to make them.

# International GCSE Computer Science

**Paper 1: Principles of computer science**

**Time: 3 hours**

**Instructions**

- Use black ink or ballpoint pen.
- Answer all questions.
- Answer the questions **requiring a written answer** in the spaces provided (there may be more space than you need).
- Some questions must be answered with a cross in a box [X]. If you change your mind about an answer, put a line through the box [X] and then mark your new answer with a cross [X].

**Information**

- The total mark for this paper is 80.
- The marks for each question are shown in brackets.

**Advice**

- Read each question carefully before you start to answer it.
- Save your work regularly.
- Check your answers and work if you have time at the end.

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

**1** The central processing unit of a computer is responsible for the running of computer programs.

**a)** The CPU can only understand binary numbers.
**(i)** Convert the 8-bit binary number 10101100 to denary. **(1)**

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**(ii)** Convert the denary number 84 to 8-bit binary. **(2)**

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**b)** Add together the following two 8-bit binary numbers. Show your answer as an 8-bit binary number. **(2)**

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

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**(c)** Another number system often used when discussing computer systems is hexadecimal. Describe the differences between binary and hexadecimal. **(4)**

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**d)** The CPU uses the fetch–decode–execute cycle. State what each stage does when fetching an instruction. **(3)**

| Stage | Answer |
|---|---|
| Fetch | |
| Decode | |
| Execute | |

**(Total for Question 1 = 12 marks)**

# Exam practice

## International GCSE Computer Science

# Describe

- Give an account of something.
- Statements must be developed.
- A justification or reason does not need to be given.

# Question:

Describe the purpose of the router in the home's network. **(2)**

What does the question want?

2 marks total.
The question asks for the purpose. It does not want to know what it is, or what it is in, but <u>why</u> it exists.

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This information is given in the question and it does not describe its purpose.

The router is an important device on the home network.

The router allows computers in the home to access the Internet.

This is not precise enough. The router is involved in allowing computers to access the Internet, but the answer needs to say how the router does this.

0 marks

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This answer shows that the router makes a decision when it directs data to the required destination. **(1)**

The router directs data to the required destination on a particular network.

The router joins different networks together and allows computers on the home network to access the Internet.

This describes the main purpose of a router – to **join different networks together** and therefore allow computers to access the Internet. **(1)**

2 marks