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Computer science
Standard level
Paper 1

30 April 2026

Zone A afternoon | **Zone B** afternoon | **Zone C** afternoon

1 hour 30 minutes

Instructions to students

- Do not open this examination paper until instructed to do so.
- Section A: answer all questions.
- Section B: answer all questions.
- The maximum mark for this examination paper is **[70 marks]**.

Section A

Answer **all** questions.

1. Identify **two** roles of a computer in a networked world. [2]

2. State **one** computer program that translates code written in a high-level language into machine-readable code. [1]

3. A computer user buys new software. User documentation is provided on the software developer's website.
Evaluate online support as a method of providing user documentation. [4]

4. Describe how colours are represented in a computer. [3]

5. (a) Identify **two** resources that can be shared on a local area network (LAN). [2]
(b) State **one** communication link that could be used to connect the LAN to a Wide Area Network (WAN). [1]

6. Consider the following algorithm:

```
J = 5
while J >= 1
    J = J - 1
    Z = R[J] mod 5
    R[Z] = J
end loop
```

and the integer array R:

[0]	[1]	[2]	[3]	[4]
15	14	17	16	19

Copy and complete the following trace table. [6]

J	J >= 1	Z	R[0]	R[1]	R[2]	R[3]	R[4]
5			15	14	17	16	19

7. A truth table with three inputs (A, B and C) and one output (OUT) needs to be constructed.

A combination of the three inputs (A, B and C) represents a binary number.

For example:

A = 1, B = 0 and C = 1 represent the binary number $101_{(2)}$.

The decimal equivalent of $101_{(2)}$ is $5_{(10)}$.

The output, OUT, should be 1 if either of the following occur:

- The binary number, represented by the combination of three inputs, has an odd number of 1s.
- The decimal equivalent of the binary number, represented by the combination of three inputs, is odd.

Otherwise, the output, OUT, is 0.

Construct the truth table as described. Note that zero (0) is an even number.

[4]

8. Outline what is meant by debugging.

[2]

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Section B

Answer **all** questions.

9. A prototype for a company's new computer system has been developed.

- (a) State **two** reasons why the company might not proceed with the new system after evaluating the prototype. [2]

After the prototype is evaluated and revised, the company decides to implement the new system, which is run in parallel with the old system.

- (b) Evaluate parallel running as part of a system installation process. [4]

The company wants to promote its services on the World Wide Web and using email to communicate with customers. To target its promotion effectively, the company has asked every customer to provide their name, email address, home address and date of birth.

- (c) (i) List **three** threats to the security of the data collected by the company. [3]
(ii) State the purpose of an email server. [1]
(iii) State **two** benefits of using email for communication among employees. [2]
(iv) Explain the need for encryption in email communication. [3]

10. (a) (i) Distinguish between primary memory and secondary memory. [3]

- (ii) Outline **two** functions of an operating system (OS) in managing primary memory. [4]

(b) A control unit (CU), an arithmetic logic unit (ALU), registers, cache memory and buses are some components of a central processing unit (CPU) that work together to execute the machine instructions.

- (i) State the role of the memory data register (MDR). [1]
(ii) Explain the use of cache memory. [3]
(iii) Explain the role of buses in CPU operations. [4]

11. In an eight-team tournament, each team plays one game with every other team. This results in seven games in a tournament.

For each game of a seven-game tournament, scores are held in the one-dimensional integer arrays `HOME` and `RIVALS`.

The array `HOME` holds the number of goals scored by the home team in each of the seven games.

The array `RIVALS` holds the number of goals scored by opposing teams in each of the seven games.

The first game of the tournament ended with a score of 77–78 in favour of the opposing team (see **Figure 1**).

Figure 1: Data held in the `HOME` and `RIVALS` arrays for the seven games of the tournament

HOME		RIVALS	
[0]	77	[0]	78
[1]	85	[1]	85
[2]	64	[2]	72
[3]	96	[3]	95
[4]	84	[4]	79
[5]	77	[5]	77
[6]	68	[6]	88

Each game results in either a win, a loss, or a draw for the home team.

For example, from **Figure 1**, the number of games lost by the home team is three.

- (a) State the number of games lost by opposing teams. [1]
- (b) Construct an algorithm in pseudocode to output the number of games lost by opposing teams in a tournament. [4]

(This question continues on the following page)

(Question 11 continued)

The losing margin for the home team is the difference in goals between the winning opposing team and the losing home team.

For example, from **Figure 1**:

- The score 77–78 shows that the home team lost the first game with a losing margin of 1.
- The score 68–88 shows that the home team lost the last game with a losing margin of 20.
- The home team’s worst game in this tournament had a losing margin of 20.

- (c) Construct an algorithm in pseudocode to output the losing margin of the home team’s worst game in this tournament.

Assume that both arrays, `HOME` and `RIVALS`, already contain data and that the home team lost at least one game.

[6]

A team receives four points for a win, two points for a draw, and zero points for a loss.

- (d) Construct an algorithm in pseudocode to output the total number of points awarded to the home team in the tournament.

[4]

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