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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 the purpose of an interpreter. [1]
3. A computer user buys new software. Help files are embedded within the software.
Evaluate help files 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:

```

N = 5
while N > 0
    Z = R[N - 1] mod 5
    R[Z] = N - 1
    N = N - 1
end loop

```

and the integer array R:

[0]	[1]	[2]	[3]	[4]
25	24	17	11	14

Copy and complete the following trace table. [6]

N	N > 0	Z	R[0]	R[1]	R[2]	R[3]	R[4]
5			25	24	17	11	14

7. A truth table with three inputs (A, B and C) and one output (Z) 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, Z, should be 1 if either of the following occur:

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

Otherwise, the output, Z, is 0.

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

[4]

8. Outline what is meant by beta testing.

[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 a 10-team sports tournament, each team plays one game with every other team. This results in nine games in a tournament.

For each game of a nine-game tournament, scores are held in the one-dimensional integer arrays $\mathbf{TA}$ and $\mathbf{OP}$.

The array $\mathbf{TA}$ holds the number of goals scored by the home team in each of the nine games.

The array $\mathbf{OP}$ holds the number of goals scored by the opposing teams in each of the nine games.

The first game of the tournament ended with a score of 5–1 in favour of the home team (see **Figure 1**).

Figure 1: Example data held in $\mathbf{TA}$ and $\mathbf{OP}$ arrays for the nine games of the tournament

$\mathbf{TA}$		$\mathbf{OP}$	
[0]	5	[0]	1
[1]	4	[1]	2
[2]	4	[2]	2
[3]	3	[3]	3
[4]	0	[4]	1
[5]	3	[5]	4
[6]	2	[6]	3
[7]	1	[7]	0
[8]	1	[8]	0

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

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

- (a) State the number of games lost by the home team. [1]
- (b) Construct an algorithm in pseudocode to output the number of games that ended with a draw. [4]

(This question continues on the following page)

(Question 11 continued)

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

For example, from **Figure 1**:

- The home team won the last game with a winning margin of 1.
- The home team won the first game with a winning margin of 4, which is the team's largest winning margin in this tournament.

- (c) Construct an algorithm in pseudocode to output the largest winning margin for the home team in this tournament.

Assume that both arrays, `TA` and `OP`, already contain data and that the home team won at least one game.

[6]

A team receives three points for a win, one point 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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