

Question 1:

[Maximum mark: 1]

Which statement best describes the function of the **Memory Data Register** (MDR)?

- a) It holds the address of the next instruction to be executed.
- b) It performs logical operations like AND, OR, and NOT.
- c) It holds the data that has just been read from or is about to be written to memory.
- d) It sends control signals to other parts of the computer.

Question 2:

[Maximum mark: 1]

Which of the following is an example of personal information that should be kept secure online?

- a) Computer model
- b) Screen size
- c) Keyboard type
- d) Password

Question 3:

[Maximum mark: 1]

A user notices that their internet speed is significantly slower during evening hours compared to early mornings. Which is the most probable cause for this variation?

- a) Decreased solar flare activity at night.
- b) Increased network congestion due to more users online
- c) The user's computer is running more background processes in the evening.
- d) Internet Service Providers intentionally slow down connections at peak times for all users.

Question 4:

[Maximum mark: 1]

What is the purpose of an **IF...THEN...ELSE** statement in a program?

- a) To repeat a set of instructions
- b) To make a decision based on a condition
- c) To store data in memory
- d) To display output on the screen

Question 5:

[Maximum mark: 1]

When a value is copied into a register, which type of operation is being performed?

- a) Data transfer
- b) Comparison
- c) Looping
- d) Decision making

Question 6:

[Maximum mark: 8]

Two lists are already sorted in ascending order.

List A: 3, 8, 15, 21, 30

List B: 2, 8, 14, 25, 35

A programmer needs to combine these two lists into a single list that remains sorted in ascending order.

- a) Explain why comparing the first unprocessed element of each list is an efficient strategy for solving this problem. **(2)**
- b) Write an algorithm or pseudocode to merge the two lists into one sorted list. Your algorithm should correctly handle duplicate values. **(4)**
- c) State the time complexity of your algorithm and briefly justify your answer. **(2)**

Question 7:

[Maximum mark: 6]

A company allows its employees to send confidential information over the internet. To protect the data from being read by unauthorized users, the company uses encryption.

- a) Explain the purpose of encryption in network security. **(2)**
- b) Describe how encryption protects data during transmission over a network. **(2)**
- c) Give one example of where encryption is commonly used in everyday life and explain why it is important in that situation. **(2)**

Question 8:

[Maximum mark: 6]

A student uploads an assignment to a school portal. During transmission, some data packets are lost due to network congestion. Despite this, the uploaded file is received correctly.

- a) Identify the network protocol responsible for ensuring that data reaches its destination correctly. **(1)**

- b)** Explain two features of this protocol that help ensure reliable data transmission. **(4)**
- c)** State one disadvantage of using this protocol compared with a protocol that does not guarantee delivery. **(1)**

Question 9:

[Maximum mark: 6]

A student switches on a computer to complete an assignment. The operating system starts automatically, and later the student opens several applications to work on different tasks.

- a)** Explain the roles of **RAM** and **ROM** during the computer's startup and normal operation. **(4)**
- b)** State **two differences** between RAM and ROM. **(2)**

Question 10:

[Maximum mark: 6]

A software developer has written two different algorithms to sort a list of 50,000 numbers. Both algorithms produce the correct result, but one finishes much faster than the other.

- a)** Explain why an efficient algorithm is generally preferred over a less efficient algorithm. **(3)**
- b)** Describe two factors that can be used to compare the efficiency of algorithms. **(2)**
- c)** Explain why algorithm efficiency becomes more important as the size of the input data increases. **(1)**