

COMPUTER SCIENCE

016

21/07/2026 8:30 AM- 11:30 AM

Names:
Index number:

COMBINATIONS:

- MATHEMATICS-COMPUTER SCIENCE-ECONOMICS (MCE)
- MATHEMATICS-PHYSICS-COMPUTER SCIENCE (MPC)

DURATION: 3 HOURS

S6

QUESTIONS and ANSWERS BOOKLET

**ADVANCED LEVEL NATIONAL EXAMINATIONS,
2025-2026**

Instructions to candidates:

- Write your names and index number on the answer booklet as written on your registration form, and **DO NOT** write your names and index number on additional answer sheets if provided.
- Do not open this question paper until you are told to do so.
- This paper consists of **THREE** sections: **A, B and C.**

Section A: Attempt **ALL** questions. (55 marks)

Section B: Attempt any **THREE** questions. (30 marks)

Section C: Attempt any **ONE** question. (15 marks)
- Use only a **blue** or **black** pen.
- For multiple choices questions, circle a letter corresponding to the correct answer.

FOR MARKER'S USE ONLY

Questions	Marks	Questions	Marks
1		16	
2		17	
3		18	
4		19	
5		20	
6		21	
7		22	
8		23	
9		24	
10		25	
11		26	
12		27	
13		28	
14		29	
15		30	

TOTAL MARKS...../100

SECTION A: ATTEMPT ALL QUESTIONS. (55 MARKS)

1) i) Which of the following is **NOT** a mobility advantage of laptops? **(2 marks)**

- A) Compact design
- B) Ability to run on battery power
- C) Integrated screen and input devices
- D) Unlimited upgrade options

ii) Answer by using **True** or **False** **(2 marks)**

- a) Smartphones are less portable than laptops. _____
- b) Tablets are larger than smartphones, but smaller than laptops. _____

2) What does a computer do during the processing phase? **(2 marks)**

- A) Stores data permanently
- B) Translates code into machine language
- C) Executes operations based on instructions
- D) Deletes unwanted information

3) Complete the following sentences with proper answers.

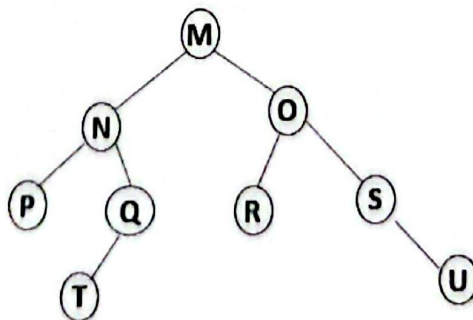
i) IPv4 uses-bit addresses, while IPv6 uses-bit addresses. **(2 marks)**

ii) Firewalls and security systems rely onto block malicious traffic. **(1 mark)**

4) i) Which traversal is best for retrieving data in sorted order from a binary search tree? **(2 marks)**

- A) In-order
- B) Pre-order
- C) Post-order
- D) Level-order

ii) The binary tree below is represented as: **(6 marks)**



Evaluate the Pre-order, In-order, and Post-order traversals of the given binary tree and select the correct option for each traversal.

A) Pre-order Traversal

- A) M, N, P, Q, T, O, R, S, U
- B) P, N, T, Q, M, R, O, U, S
- C) M, O, R, S, U, N, P, Q, T
- D) T, Q, P, N, U, S, R, O, M

B) In-order Traversal

- A) P, Q, T, N, M, R, O, U, S
- B) M, N, P, Q, T, O, R, S, U
- C) P, N, T, Q, M, R, O, S, U
- D) T, Q, P, N, M, R, U, S, O

A) Post-order Traversal

- A) T, Q, P, N, U, S, R, O, M
- B) M, N, P, Q, T, O, R, S, U
- C) P, Q, T, N, R, S, U, O, M
- D) P, T, Q, N, R, U, S, O, M

5) i) Which of the following runs in user mode?

(2 marks)

- A) Device drivers
- B) Operating system kernel
- C) Application software
- D) Memory management unit

ii) Which scheduling type may cause long waiting times if a process hangs onto the CPU?

(2 marks)

- A) Preemptive scheduling
- B) Non-preemptive scheduling
- C) Both
- D) None

- 6) i) What is a pixel in computer graphics? **(2 marks)**
- A) A unit of memory
 - B) A point of light on a screen
 - C) The smallest graphical unit on a screen
 - D) A type of graphic software

- ii) Which of the following learning styles does multimedia support? **(2 marks)**
- A) Visual learners
 - B) Auditory learners
 - C) Kinesthetic learners
 - D) All of the above

- 7) i) Match the Database Threats with corresponding Mitigation Strategies **(3 marks)**

Database Threats	Mitigation Strategies
a) Human Threats	i) Offsite backups and disaster recovery plans
b) Technical Threats	ii) Monitoring and auditing user activity
c) Physical Threats	iii) Regular system updates and vulnerability scanning

- ii) What is the role of WHERE clause in SQL queries? **(2 marks)**
- A) It is used to specify which columns should be retrieved.
 - B) It filters rows based on a specified condition.
 - C) It sorts the query results in ascending or descending order.
 - D) It groups rows that have the same values into summary rows.

- 8) i) What is the output of the following block of code? **(2 marks)**
- ```
int x=3;
cout << (x > 10 ? 100 : (x > 5 ? 50 : 0));
```

- ii) What will be the output of the following program? **(2 marks)**

```
#include <iostream>
using namespace std;
int main() {
 int a=7, b=3;
 cout << a/b;
 return 0;
}
```

- A) 10
- B) 2
- C) 2.33
- D) Error

9) Write a CSS rule to set the background colour to blue and text colour to white for a webpage. **(3 marks)**

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10) i) Indicate whether the following statements about the key differences between DAO and ADO in Visual Basic are **True** or **False**: **(2 marks)**

- A) DAO is optimized for Access, while ADO is for universal database access. \_\_\_\_\_
- B) ADO performs better than DAO with Access databases. \_\_\_\_\_

ii) What will be printed by this loop?

**(2 marks)**

```
Private Sub Command1_Click()
 Dim total As Integer
 total = 0
 For i = 1 To 3
 total = total + i
 Next i
 Print total
End Sub
```

- A) 6
- B) 3
- C) 1 2 3
- D) Error

11) i) What happens if a constructor is declared private?

**(2 marks)**

- A) The class can be instantiated normally.
- B) The class cannot be extended.
- C) Objects of the class cannot be created from outside the class.
- D) The class behaves like an abstract class.

ii) Why is Catalina important in the Tomcat architecture? **(2 marks)**

- A) It manages server configurations.
- B) It acts as the servlet container.
- C) It handles HTTP protocols.
- D) It monitors server status.

iii) What will be displayed if the user input 3 **(3 marks)**

```
import java.util.Scanner;

public class Factorial {

 public static void main(String[] args) {
 Scanner sc = new Scanner(System.in);
 System.out.print("Enter a number: ");
 int number = sc.nextInt();
 int factorial = 1;
 for (int i = 1; i <= number; i++) {
 factorial *= i;
 }
 System.out.println("Factorial of " + number + " is: " + factorial);
 sc.close();
 }
}
```

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12) What will be the output of the following? **(3 marks)**

```
import java.util.*;

public class LinkedHashSetExample {

 public static void main(String[] args) {
 List<String> items = Arrays.asList("Apple", "Banana", "Apple", "Orange");
 LinkedHashSet<String> uniqueItems = new LinkedHashSet<>(items);
 System.out.println("Unique items (preserving order): " + uniqueItems);
 }
}
```

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- 13) i) What is the primary purpose of file handling in C++? (2 marks)
- A) To display data
  - B) To store data permanently
  - C) To delete temporary files
  - D) To manage memory allocation

- ii) Why is the close() function essential in file handling? (2 marks)
- A) It prevents memory leaks by releasing resources used by the file.
  - B) It automatically deletes the file after use.
  - C) It ensures all data is deleted from the file before closing.
  - D) It prevents other programs from accessing the file permanently.

**SECTION B: ATTEMPT ANY THREE QUESTIONS. (30 MARKS)**

- 14) The steps for making an Ethernet cable have been listed below in a disordered manner. Rearrange them in the correct order: (10 marks)

- i) Crimp the connectors using an RJ-crimping tool,
- ii) Strip the cable jacket about 4cm from the end,
- iii) Cut the wires straight and insert them into the RJ-45 connectors,
- iv) Test the cable using a cable tester,
- v) Untwist and align the wires in the T568A orientation on one end and T568B on the other.

- 15) Given the table "Staff", answer the questions provided below (10 marks)

| EmployeeID | Name          | Department | Salary | HireDate   |
|------------|---------------|------------|--------|------------|
| 1          | Karangwa Anne | HR         | 150000 | 2020-04-01 |
| 2          | Kwizera Pablo | IT         | 570000 | 2018-06-15 |
| 3          | Sam Kabaya    | IT         | 650000 | 2019-06-10 |
| 4          | Anna Mutoni   | Finance    | 360000 | 2021-04-20 |
| 5          | Bagaya Green  | HR         | 252000 | 2020-06-25 |

- i) Write a query to display all Staff in the IT department.
- ii) Find the total salary paid to Staff in the HR department.
- iii) Insert a new employee into the Staff table with the following details:
  - o EmployeeID: 6
  - o Name: Kamasa ben
  - o Department: Ejo heza
  - o HireDate: 2025-05-15

iv) Delete all Staff from the Finance department.

v) Write a query to increase the salary of all Staff in the HR department by 24%.

16) Write pseudocode and draw a flowchart that prompts for five numbers, and then calculates sum and average. The computer should display total sum and average of the five numbers. **(10 marks)**

17) Develop a VB application that displays the following pattern of numbers on the Label. You may use VB6.0 or VB.NET. **(10 marks)**

```
Form1
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
1 2 3 4
1 2 3
1 2
1
```

18) Develop a class Student with instance variables name and age. Add a parameterised constructor which demonstrates the use of **this** keyword for distinguishing local variables and instance variables. Add also a displayInfo method that print Student name and age. Create a program StudentDemo with main method and instantiate two objects of Student class and call displayInfo method on each object. **(10 marks)**

**SECTION C: ATTEMPT ANY ONE QUESTION. (15 MARKS)**

19) The school installs antivirus software, configures firewalls, and blocks access to malicious websites on all lab computers to protect them from cyberattacks.

Write down ways to protect a computer from logical threats. **(15 marks)**

20) Write a C++ program using OOP concepts to create a BankAccount class with attributes accountNumber, accountHolderName, and balance with a parameterized constructor to initialize its attributes. Include methods to deposit money, withdraw money, and display account details. Use main method to create an object of BankAccount and call its method.

(15 marks)

***Space wherein to answer three chosen questions in section B***