



Computer Science

016

15/07/2025 8:30 AM- 11:30 AM

Names:

Index number:

SUBJECT: COMPUTER SCIENCE

COMBINATIONS:

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

DURATION: 3 HOURS

S6 QUESTIONS and ANSWERS BOOKLET

ADVANCED LEVEL NATIONAL EXAMINATIONS,
2024-2025

Instructions to candidates:

- 1) Write your names and index number on the answer booklet as written on your registration form.
- 2) Do not open this question paper until you are told to do so.
- 3) 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)**
- 4) Use only a **blue or black pen**.
- 5) **For multiple choice questions circle the correct answer only.**

FOR EXAMINER'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) Choose and circle the letter corresponding to the correct answer. **(2 marks)**

What is the most important safety precaution to take when cleaning a laptop?

- a) Use harsh chemicals.
- b) Power it off and unplug it.
- c) Clean while it's running.
- d) Don't worry about safety precautions.

- 2) What does 'backup' refer to in computer usage? **(3 marks)**

- a) Updating software regularly
- b) Storing duplicate copies of data files
- c) Restarting the computer to fix issues
- d) Deleting unnecessary files

- 3) Select the best answer for the following expression: **(8 marks)**

i) $1110_2 + 1111_2$ **(2 marks)**

- a) 11001_2
- b) 11101_2
- c) 11100_2
- d) 10101_2

ii) $10101110_2 - 100110_2$ **(2 marks)**

- a) 10001000_2
- b) 10101000_2
- c) 10001100_2
- d) 10001001_2

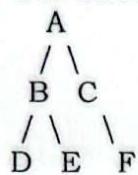
iii) $17.125_{10} = (\quad)_2$ **(4 marks)**

- a) 11001.001_2
- b) 10011.001_2
- c) 10001.001_2
- d) 10101.001_2

4) What is the purpose of video compression in digital video editing? **(3 marks)**

- a) To increase video quality
- b) To reduce file size
- c) To add visual effects
- d) To adjust colour grading

5) 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.

Options:

i) Pre-order Traversal

- a) A, B, D, E, C, F
- b) B, D, E, A, C, F
- c) D, B, E, A, C, F
- d) A, C, F, B, D, E

ii) In-order Traversal

- a) A, B, D, E, C, F
- b) D, B, E, A, C, F
- c) B, D, E, A, F, C
- d) A, C, F, B, D, E

iii) Post-order Traversal

- a) A, B, D, E, C, F
- b) B, D, E, A, C, F
- c) D, B, E, F, C, A
- d) D, E, B, F, C, A

6) What is the purpose of database security? **(3 marks)**

- a) To ensure databases are always available
- b) To protect databases from unauthorized access and data breaches
- c) To optimize database performance
- d) To design database schemas

- 7) Which of these is a primary component of LAN architecture? **(2 marks)**
- a) Printer
 - b) NIC (Network Interface Card)
 - c) Monitor
 - d) Keyboard
- 8) Which step is part of setting up a wireless router for network connectivity? **(3 marks)**
- a) Enabling file sharing
 - b) Configuring DHCP settings
 - c) Building Ethernet cables
 - d) Installing network drivers
- 9) Select the best output of the following program, and explain why? **(5 marks)**

```
#include <iostream>
using namespace std;
int main() {
    int x = 7, y = 5;
    cout << (x == y) << endl;
    cout << (x > y) << endl;
    cout << (x != y) << endl;
    return 0;
}
```

- a) 0 1 1
- b) 1 1 1
- c) 1 0 1
- d) 0 1 0

Explanation:

10) Match the HTML elements with their purposes: **(4 marks)**

- | | |
|----------|--------------------------------|
| a) <h1> | i) Adds a paragraph. |
| b) <p> | ii) Defines a hyperlink. |
| c) | iii) Adds a top-level heading. |
| d) <a> | iv) Embeds an image. |

11) i) Why is the Scanner class preferred for reading user input? **(3 marks)**

- a) It provides synchronized methods.
- b) It offers convenient methods for parsing primitive types and strings.
- c) It directly connects to file streams.
- d) It is faster than other input methods.

ii) What is the primary purpose of Apache Tomcat? **(2 marks)**

- a) To manage databases
- b) To serve Java applications
- c) To compile Java code
- d) To design GUIs

12) i) What is the role of the Front End in a Visual Basic project? **(3 marks)**

- a) To manage and store data in a database.
- b) To handle the logic and functionality of the application.
- c) To provide the user interface for interacting with the application.
- d) To optimize the performance of back-end processes.

ii) What function is used to display a message box in Visual Basic? **(2 marks)**

- a) InputBox
- b) MessageBox
- c) MsgBox
- d) Print

13) Determine whether the following statements about the differences between static and dynamic web pages are **True or False:** **(6 marks)**

a) Static page load faster as they don't rely on back-end

processes.....

b) Static pages show fixed content, while dynamic pages update based on user input.....

c) Static pages need server-side scripting, dynamic pages do not.

.....

Section B: Attempt any three questions. (30 marks)

Space in which to answer the chosen three questions is at the end of section C.

- 14) Determine whether the following statements about the importance of proper file space allocation strategies in operating systems are **True** or **False**: **(10 marks)**

- a) Proper allocation does **NOT** significantly affect disk space or fragmentation.....
- b) Improper allocation can slow down data retrieval and increase resource use.....
- c) Efficient allocation improves system performance by reducing management overhead.....
- d) File allocation is only crucial for large systems, **NOT** small ones.....
- e) A good allocation strategy compromises system reliability and recovery.....

- 15) i) What is the purpose of relational algebra? **(2 marks)**
Select best answer.

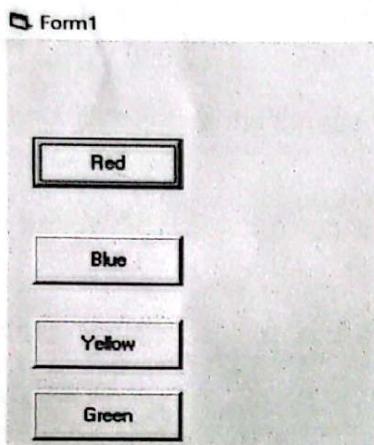
- a) To query databases using mathematical operations
- b) To secure databases from unauthorized access
- c) To design database schemas
- d) To manipulate data in databases

- ii) Match the following types of data integrity with their correct definitions: **(8 marks)**

Type of Integrity	Definition
1) Entity Integrity	a) Restricts data type, format, or range of values allowed in a column.
2) Referential Integrity	b) Ensures foreign key values in a table correspond to primary keys in another table.
3) Domain Integrity	c) Every table row must have a unique identifier (Primary Key).
4) User-Defined Integrity	d) Enforces specific business rules outside the above categories.

- 16) Develop a VB 6.0 or VB. net application that allows user to change the background colour of the form in the sequence of red, blue, yellow, and green depending on a command button clicked as shown here below:

(10 marks)



- 17) Analyse the program given below and give its output appropriately.

(10 marks)

```
#include <iostream>
int main() {
    int arr[5] = {10, 20, 30, 40, 50};
    int *ptr = &arr[4];
    std::cout << "Elements of the array accessed using pointer:\n";
    for (int i = 0; i < 5; ++i) {
        std::cout << "Element " << sizeof(arr)/sizeof(int)-i << ": " << *(ptr-i) << std::endl;
    }
    std::cout << "\nModified elements of the array using pointer:\n";
    for (int i = 4; i >= 0; i--) {
        *(ptr-i) += 5;
        std::cout << "Element " << 5-i << ": " << arr[4-i] << std::endl;
    }
    return 0;
}
```

- 18) Draw a flowchart to add even numbers from 0 to 20.

(10 marks)

Section C: Attempt any one question. (15 marks)

- 19) Develop a Java servlet that handles HTTP GET requests and responds with a simple HTML page displaying a welcome message. **(15 marks)**

20) Write a C++ program using a friend function to access private data and calculate the tax on an employee's salary which is 30% of the salary. **(15 marks)**

Space in which to answer the chosen 3 questions from section B.