

# Faculty of Science

## End Semester Examination May 2025

### BT3SE01 Computer For Biologists

<b>Programme</b>	:	B. Sc.	<b>Branch/Specialisation</b>	:	BT
<b>Duration</b>	:	3 hours	<b>Maximum Marks</b>	:	60

**Note:** All questions are compulsory. Internal choices, if any, are indicated. Assume suitable data if necessary. Notations and symbols have their usual meaning.

<b>Section 1 (Answer all question(s))</b>				<b>Marks CO BL</b>
<b>Q1.</b> Which unit of a digital computer is responsible for performing arithmetic and logical operations?				1 1 2
<input type="radio"/> Control unit <input checked="" type="radio"/> ALU		<input type="radio"/> Input unit <input type="radio"/> Output unit		
<b>Q2.</b> What is the role of the control unit in a computer?				1 1 2
<input type="radio"/> Performs arithmetic calculations <input type="radio"/> Stores data permanently		<input checked="" type="radio"/> Controls the flow of data and instructions <input type="radio"/> Interacts only with the input devices		
<b>Q3.</b> What is the 1's complement of the binary number 1010?				1 2 2
<input type="radio"/> 1010 <input type="radio"/> 1111		<input checked="" type="radio"/> 0101 <input type="radio"/> 0000		
<b>Q4.</b> How is a negative number represented in binary?				1 2 3
<input type="radio"/> Using 1's complement <input type="radio"/> Using sign-magnitude method		<input type="radio"/> Using 2's complement <input checked="" type="radio"/> All of the above		
<b>Q5.</b> What is the primary function of ROM?				1 3 2
<input type="radio"/> Temporary data storage <input type="radio"/> Processing instructions		<input checked="" type="radio"/> Permanent data storage <input type="radio"/> Enhancing CPU speed		
<b>Q6.</b> Which storage device is non-volatile and used for long-term data storage?				1 3 2
<input checked="" type="radio"/> RAM <input type="radio"/> Hard disk		<input type="radio"/> Cache <input type="radio"/> Register		
<b>Q7.</b> Which of the following is a valid C keyword?				1 4 2
<input type="radio"/> print <input checked="" type="radio"/> float		<input type="radio"/> data <input type="radio"/> function		
<b>Q8.</b> Which of the following control statements is used for looping in C?				1 4 2
<input type="radio"/> if <input checked="" type="radio"/> while		<input type="radio"/> switch <input type="radio"/> break		
<b>Q9.</b> How do you declare a 2D array in C?				1 5 3
<input type="radio"/> int array[10]; <input type="radio"/> int array;		<input checked="" type="radio"/> int array[10][10]; <input type="radio"/> array[10,10];		
<b>Q10.</b> Which keyword is used to define a function in C?				1 5 3
<input type="radio"/> define <input type="radio"/> #define		<input type="radio"/> function <input checked="" type="radio"/> void		

### Section 2 (Answer all question(s))

**Marks CO BL**

**Q11.** Define the term "Algorithm" and explain its importance in problem-solving.

2 1 2

Rubric	Marks
Define the term "Algorithm".	1
explain its importance in problem-solving.	1

**Q12.** Explain the difference between RAM and ROM.

3 1 2

Rubric	Marks
Difference between RAM and ROM. (1 mark for each difference)	3

**Q13. (a)** What is the significance of the number system in computer science? Explain with examples.

5 1 3

Rubric	Marks
Significance of the number system in computer science.	2
Explain with examples.	3

**(OR)**

**(b)** Explain the concept of "Memory Hierarchy" in a computer system.

Rubric	Marks
Define Memory Hierarchy.	2
Structure "Memory Hierarchy" in a computer system.	3

### Section 3 (Answer all question(s))

**Marks CO BL**

2 2 3

**Q14.** Write a C program to check if a number is even or odd.

Rubric	Marks
C program for right syntax	1
check if a number is even or odd. (correct Logic)	1

**Q15.** Explain the concept of "Recursion" in C programming with an example.

3 2 3

Rubric	Marks
concept of "Recursion" in C programming.	1
Recursion program.	2

**Q16. (a)** Write a C program to generate the Fibonacci series using recursion.

5 2 3

Rubric	Marks
Write a C program to generate the Fibonacci series using recursion.	5

**(OR)**

**(b)** Write a C program to swap two numbers without using a third variable.

Rubric	Marks
. Write a C program to swap two numbers without using a third variable.	5

#### Section 4 (Answer all question(s))

**Q17.** Explain the functional units of a computer system with a block diagram.

Marks CO BL  
2 3 2

Rubric	Marks
Explain Computer system	1
computer system with a block diagram.	1

**Q18.** What is the role of the ALU in a computer? Explain with an example.

3 3 3

Rubric	Marks
What is the role of the ALU in a computer?	2
Explain with an example.	1

**Q19. (a)** Explain the different types of computer memory.

5 3 1

Rubric	Marks
Primary memory.	2.5
Secondary Memory.	2.5

**(OR)**

**(b)** Discuss the evolution of computers from the first generation to the present day.

Rubric	Marks
1 mark each for each generation.	5

#### Section 5 (Answer all question(s))

**Q20.** Convert the binary number 10101 to its decimal equivalent.

Marks CO BL  
2 4 3

Rubric	Marks
10101 to its decimal equivalent. Ans: $1 \times 2^4 + 0 \times 2^3 + 1 \times 2^2 + 0 \times 2^1 + 1 \times 2^0 = (1 \times 16) + (0 \times 8) + (1 \times 4) + (0 \times 2) + (1 \times 1) = 21$	2

**Q21.** Discuss the floating-point representation with an example.

3 4 3

Rubric	Marks
floating-point representation	2
With an example.	1

**Q22. (a)** Perform the subtraction of 1101 and 1001 using 2's complement method.

5 4 3

Rubric	Marks
Convert numbers to 4-bit binary: • Minuend: $1101_2$ • Subtrahend: $1001_2$  Find 2's complement of $1001_2$ : • 1's complement: $0110_2$ • Add 1: $0111_2$  Add Minuend and 2's Complement of Subtrahend: $\begin{array}{r} 1101_2 \\ + 0111_2 \\ \hline \end{array}$ 0100 <sub>2</sub> (Ignore carry) Result: 0100 <sub>2</sub> (Decimal: 4)	5

**(OR)**

**(b)** Explain the ASCII code and its significance in computer systems.

Rubric	Marks
Explain the ASCII code and its significance in computer systems.	5

### Section 6 (Answer all question(s))

**Marks CO BL**

**Q23.** Write a C program to find the largest element in an array.

2 5 3

Rubric	Marks
Write a C program to find the largest element in an array.	2

**Q24.** Explain the concept of "Arrays" in C programming with an example.

3 5 2

Rubric	Marks
Explain the concept of Arrays	1
Arrays with an example.	2

**Q25. (a)** Write a C program to insert an element into an array at a specified position.

5 5 3

<b>Rubric</b>	<b>Marks</b>
Write a C program to insert an element into an array at a specified position.	5

**(OR)**

- (b)** Differentiate between passing parameters by value and by reference in C functions with suitable examples.

<b>Rubric</b>	<b>Marks</b>
explanation of passing parameters by value and by reference in C functions.	2
Difference between passing parameters by value and by reference in C functions with suitable examples.	3

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