

Dr. Babasaheb Ambedkar Open University
Term End Examination January – 2026

Course	: MSCDS	Date	: 16/02/2026
Subject Code	: MSCDS-101	Time	: 11:30am to 01:45pm
Subject Name	: Data Structure and Algorithms	Duration	: 02.15 Hours
		Max. Marks	: 70

Section A

Answer the following (Attempt any three) (30)

1. Define Computer System, Data, and Information. Explain the role of hardware and software with examples.
2. Describe the basic structure of a C program, including the Header File Section, Main Function, and Global Declaration.
3. Define Data Structure. Classify them into Primitive and Non-primitive types with a detailed category-wise diagram.
4. Explain the importance of Algorithms and Flowcharts in logic building. Draw a flowchart to check if a number is Even or Odd.
5. What is Recursion? Explain with a C program example to find the factorial of a given number.

Section B

Answer the following (Attempt any four) (20)

1. State the rules for defining variable names in C-Language.
2. Differentiate between Formatted (printf/scanf) and Unformatted (getch/puts) I/O functions.
3. Define Arrays and explain the difference between One-Dimensional and Two-Dimensional arrays.
4. What is a Pointer? Explain the use of the address operator (&) and the indirection operator (*).
5. Explain the difference between Structures and Unions in terms of memory storage.
6. Describe the use of 'Break' and 'Continue' keywords in loop control.

Section C

Part – A (Multiple Choice Questions) (10)

- Which keyword is used for a user-defined data type?
A Int B Float
C Struct D Void
- What is the format string for a 'long int' variable?
A %d B %ld
C %u D %f
- Which header file is needed for 'printf()' and 'scanf()'?
A conio.h B math.h
C stdio.h D string.h
- The index of a C array always starts with:
A 1 B -1
C 0 D Any

- 5 Which operator is used to find the size of a variable?
A size() B Sizeof
C Length D len
- 6 A pointer variable is used to store:
A Data B Address
C Constant D Value
- 7 Which of these is a non-linear data structure?
A Stack B Queue
C Tree D Array
- 8 Which escape sequence is used for a new line?
A \t B \a
C \n D \b
- 9 'while' and 'for' loops are known as:
A Exit Control B Entry Control
C Unconditional D Nested
- 10 Which function is used to reverse a string?
A strlen() B strcpy()
C strev() D strcat()

Part – B (Do as Directed)

(10)

State whether the following statements are true or false

- 1 C-Language is a procedure-oriented programming language.
- 2 A global variable is only accessible inside the main() function.
- 3 Logic building can be done using flowcharts and algorithms.
- 4 The '=' operator is used for assignment in C.
- 5 A structure can store data of different types (heterogeneous).
- 6 'malloc()' function is used for static memory allocation.
- 7 The default return type of a function is 'int' if not mentioned.
- 8 In a circular queue, the last position is connected to the first.
- 9 Every C statement must end with a colon (:).
- 10 Stack follows the LIFO (Last In First Out) principle.
