

[4]

- ii. Define union in C, what are its uses. How to declare Union, initialize the members of the union and access the members of the union, explain with example. **6** 02 02 02
- OR iii. Write a C language program to define structure containing course name, number of students and roll number. Read three records and display it. **6** 03 03 03
- Q.6 Attempt any two:
- Write a program for File open(), File write(), File Close(). **5** 03 03 03
 - Explain the dynamic memory allocation with example. **5** 02 02 02
 - What are pointer variables, how it is different from the normal variables? Explain pointer variable declaration. Write a C program to swap values of two variable using pointers. **5** 03 03 03

Total No. of Questions: 6

Total No. of Printed Pages: 4

Enrollment No.....



Faculty of Science/Engineering
End Sem Examination Dec 2024

CA3CO01 Problem Solving & Programming

Programme: BCA/
BCA-MCA (Integrated)

Branch/Specialisation: Computer
Application

Duration: 3 Hrs.

Maximum Marks: 60

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

Marks	BL	PO	CO	PSO
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- Q.1 i. Which of the following is correct for C programming language? **1** 01 01 01
- (a) Scripting programming language
 - (b) Object oriented programming language
 - (c) Natural programming language
 - (d) Structured programming language
- ii. Which of the following is not an advantage of a flowchart? **1** 01 01 01
- (a) Better communication
 - (b) Efficient coding
 - (c) Systematic testing
 - (d) Improper documentation
- iii. What will be the output of the following C code? **1** 01 01 01
- ```
#include <stdio.h>
int main()
{
 int y = 10000;
 int y = 34;
 printf("Hello World! %d\n", y);
 return 0;
}
```
- (a) Compile time error
  - (b) Hello World! 34
  - (c) Hello World! 1000
  - (d) Hello World! followed by a junk value

|                                                                                                                                                  | [2]        |                                                                                                                                                                        | [3]        |
|--------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| iv. The format identifier ‘%i’ is also used for which data type-                                                                                 | 1 01 01 01 | x. What is the purpose of the “w” mode when opening a file in C?                                                                                                       | 1 01 01 01 |
| (a) char (b) int<br>(c) float (d) double                                                                                                         |            | (a) To read data from the file<br>(b) To write data to the file, overwriting existing content<br>(c) To append data to the end of the file<br>(d) To create a new file |            |
| v. How do you initialize an array in C?                                                                                                          | 1 01 01 01 |                                                                                                                                                                        |            |
| (a) int arr[3] = {1,2,3};<br>(b) int arr(3) = {1,2,3};<br>(c) int arr[3] = {1,2,3};<br>(d) int arr(3) = (1,2,3);                                 |            |                                                                                                                                                                        |            |
| vi. What will be the output of the program?                                                                                                      | 1 01 01 01 | Q.2 i. What is an algorithm? List any two characteristics of an algorithm.                                                                                             | 2 01 01 01 |
| #include<stdio.h><br>#include<string.h><br>int main()<br>{<br>printf("%d\n", strlen("123456"));<br>return 0;<br>}<br>(a) 6 (b) 12<br>(c) 7 (d) 2 |            | ii. Design a flowchart to find largest numbers among three numbers.                                                                                                    | 3 03 03 03 |
| vii. Which operator connects the structure name to its member name?                                                                              | 1 01 01 01 | iii. Explain the functions of compilers and interpreters. What is the difference between linkers and loaders?                                                          | 5 02 02 02 |
| (a) –<br>(b) <<br>(c) .<br>(d) Both (a) & (b)                                                                                                    |            | OR iv. What is problem solving? Explain the steps of problem solving.                                                                                                  | 5 02 02 02 |
| viii. What does the “size of “operator in c return for a union?                                                                                  | 1 01 01 01 | Q.3 i. How many types of operators we have in C language? What is operator's precedence and associativity?                                                             | 2 01 01 01 |
| (a) Total size of all union members<br>(b) Size of the largest member<br>(c) Size of the smallest member<br>(d) Size of the union itself         |            | ii. Explain switch case statement with syntax and suitable example. What will happen if break is not used in switch case block?                                        | 8 02 02 02 |
| ix. Which is an indirection operator among the following?                                                                                        | 1 01 01 01 | OR iii. Explain goto statement with syntax. Construct a program to find whether given number is even or odd using goto statement.                                      | 8 03 03 03 |
| (a) &<br>(b) *<br>(c) -><br>(d) .                                                                                                                |            | Q.4 i. What is the concept of array? How many types of array we have in C language? Explain with examples.                                                             | 3 02 02 02 |
|                                                                                                                                                  |            | ii. what is string? Write a program to find the length of string without using strlen function.                                                                        | 7 03 03 03 |
|                                                                                                                                                  |            | OR iii. What is function in C language? Explain call by value and call by reference by program.                                                                        | 7 02 02 02 |
|                                                                                                                                                  |            | Q.5 i. What is a structure in C language? How it is different from array. How to access structure elements explain it with example.                                    | 4 02 02 02 |

**Marking Scheme**  
**CA3CO01 (T) Problem Solving & Programming (T)**

|     |                                   |                                                                                                                                                              |           |     |                                                                   |                                                                                                                                        |                                                      |                                                 |
|-----|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----|-------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-------------------------------------------------|
|     |                                   |                                                                                                                                                              | OR        | iv. | What is problem solving?<br>Explain the steps of problem solving. | – 1 mark<br>– 4 marks                                                                                                                  | <b>5</b>                                             |                                                 |
| Q.1 | i)                                | d. Structured programming language                                                                                                                           | 1         | Q.3 | i.                                                                | Types of operators<br>Operator's precedence and associativity                                                                          | – 0.5 mark<br>– 1.5 marks                            | <b>2</b>                                        |
|     | ii)                               | d. Improper documentation                                                                                                                                    | 1         |     | ii.                                                               | Explanation of Switch Case Statement.<br>Syntax + Example                                                                              | –3 marks<br>–2 marks                                 | <b>8</b>                                        |
|     | iii)                              | #include <stdio.h><br><br>int main()<br>{<br>int y = 10000;<br>int y = 34;<br>printf("Hello World! %d\n", y);<br>return 0;<br>}<br><br>a) Compile time error | 1         |     |                                                                   | If break is not used in switch case block<br><br>OR     iii.                                                                           | –3 marks<br>– 2 marks<br>syntax<br>Construct program | – 3 marks<br>– 2 marks<br>– 1 mark<br>– 5 marks |
|     | iv)                               | The format identifier '%i' is also used for which data type.                                                                                                 | 1         | Q.4 | i.                                                                | Concept of array<br>Types of array                                                                                                     | – 1 mark<br>– 2 marks                                | <b>3</b>                                        |
|     | b)                                | int                                                                                                                                                          |           |     | ii.                                                               | What is String?                                                                                                                        | – 2 marks                                            | <b>7</b>                                        |
| v)  | c)                                | int arr[3] = {1,2,3};                                                                                                                                        | 1         |     |                                                                   | Write a program to find the length of string without using strlen function.                                                            | – 5 marks                                            |                                                 |
| vi) | #include<stdio.h>                 |                                                                                                                                                              | 1         | OR  | iii.                                                              | What is Function<br>Explain call by value by program                                                                                   | – 2 marks<br>– 2.5 marks                             | <b>7</b>                                        |
|     | #include<string.h>                |                                                                                                                                                              |           |     |                                                                   | Explain call by reference by program.                                                                                                  | – 2.5 marks                                          |                                                 |
|     | int main()                        |                                                                                                                                                              |           | Q.5 | i.                                                                | Structure in C language<br>Difference from Array<br>access Structure elements                                                          | – 1 mark<br>– 1 mark<br>– 2 marks                    | <b>4</b>                                        |
|     | {                                 |                                                                                                                                                              |           |     | ii.                                                               | Union in C<br>Its uses<br>declare Union, initialize the members of the Union and access the members of the Union, explain with example | – 1 mark<br>– 2 marks<br>– 3 marks                   | <b>6</b>                                        |
|     | printf("%d\n", strlen("123456")); |                                                                                                                                                              |           | OR  | iii.                                                              | program to<br>define structure<br>Read 3 records and display it                                                                        | – 2 marks<br>– 4 marks                               |                                                 |
|     | return 0;                         |                                                                                                                                                              |           |     |                                                                   |                                                                                                                                        |                                                      |                                                 |
|     | }                                 |                                                                                                                                                              |           | Q.6 |                                                                   | Attempt any two:<br><br>i.                                                                                                             | – 1 mark                                             | <b>5</b>                                        |
| Q.2 | i.                                | What is an Algorithm?                                                                                                                                        | – 1 mark  | 2   | i.                                                                | Program for File open(), File write(), File Close().                                                                                   | – 1 mark                                             |                                                 |
|     |                                   | List any two characteristics of an algorithm.                                                                                                                | – 1 mark  |     |                                                                   | Stepwise marking                                                                                                                       | – 3 marks                                            |                                                 |
|     | ii.                               | Design a flowchart to find largest numbers among three numbers.                                                                                              | – 3 marks | 3   | ii.                                                               | Dynamic memory allocation<br>Explanation                                                                                               | – 3 marks                                            | <b>5</b>                                        |
|     | iii.                              | Compilers and Interpreters                                                                                                                                   | – 3 marks | 5   |                                                                   | Example                                                                                                                                | – 2 marks                                            |                                                 |
|     |                                   | Difference between Linkers and Loaders                                                                                                                       | – 2 marks |     |                                                                   |                                                                                                                                        |                                                      |                                                 |

[2]

- iii. Pointer variables – 1 mark **5**
- Different from the normal variables – 1 mark
- Pointer variable declaration – 1 mark
- C program – 2 marks ( 1 for input + Output & 1 for logic)

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[3]