

BCA/PPC : 104 (O)

2025

(1st Semester)



BACHELOR OF COMPUTER APPLICATIONS

Paper : PPC : 104 (Old Course)

(Programming and Problem Solving through 'C')

Full Marks : 70

Pass Marks : 45%

Time : 3 hours

(PART : B—DESCRIPTIVE)

(Marks : 45)

*The figures in the margin indicate full marks
for the questions*

1. (a) Describe the different types of operators in C with appropriate examples. 6

(b) Evaluate the given expression following precedence and associativity rules : 3

$$\text{result} = 10 + 20 * 5 / 2 - 3$$

Or

(c) Explain the purpose of printf() and scanf() functions. Discuss the role of format specifiers in these functions and provide examples of how they are used. 6

(d) What are the rules for declaring a variable? 3

2. (a) Explain the three primary looping constructs in C : for, while and do-while. Discuss the key difference between them and provide a suitable example for each. 9

Or

- (b) Write a C program that declares an array of 10 integers, takes input from the user to fill the array, and then prints the sum and average of all the elements in the array. 5
- (c) What is the significance of a null character (10)? Write a program to count the number of vowels in a given string. 1+3=4

3. (a) Write a program that defines a structure for a student with name, roll_number and marks, declares a variable of this structure and prints its members. 5
- (b) Explain the concept of a union in C with a program example. 4

Or

- (c) Explain the following class specifiers : 8
- (i) auto
 - (ii) register
 - (iii) static
 - (iv) extern

(d) Explain the concept of 'top-down approach' to problem-solving in programming. 1

4. (a) Write a C program to demonstrate how to swap the values of two variables using pointers. 4

(b) What is a null pointer? 1

(c) Write a program to create a simple linked list with three nodes, and print the elements of the list. 4

Or

(d) Explain the purpose of the following : 4

(i) malloc()

(ii) calloc()

(iii) free()

(iv) realloc()

(e) List out the advantages of a linked list over arrays. 3

(f) Explain pointer arithmetic in C. 2

5. (a) Write a program that opens a file named 'test.txt' in write mode, writes a single line of text, and then closes the file. 4

(4)

- (b) Explain the `feof( )` and `ferror( )` functions for error handling during file I/O operations. Write a program that demonstrates how to check for an end-of-file condition using `feof( )`. 5

Or

- (c) Write a C program that reads a text file character by character, counts the number of spaces and newline characters, and prints the total count for each. 5
- (d) What is the difference between text mode and binary mode for file I/O in C? 2
- (e) Explain the functions `fputc( )` and `fgetc( )`. 2

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(1st Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper : PPC : 104 (Old Course)

(**Programming and Problem Solving through 'C'**)

(**PART : A—OBJECTIVE**)

(Marks : 25)

The figures in the margin indicate full marks for the questions

1. Choose the most appropriate answer from the given options by putting a Tick (✓) mark in the brackets provided : 1×10=10

(a) C programs are converted into machine language with the help of

- (i) an editor ()
- (ii) a compiler ()
- (iii) an operating system ()
- (iv) None of the above ()

(b) Which of the following shows the correct hierarchy of arithmetic operations in C?

(i) $/ + * -$ ()

(ii) $* - / +$ ()

(iii) $+ - / *$ ()

(iv) $* / + -$ ()

(c) The type of statement written in sequence and is repeated until the specific condition is met is classified as

(i) format ()

(ii) loop ()

(iii) case ()

(iv) condition ()

(d) When variable used in program is whole number, the variable is stored as

(i) fixed string ()

(ii) integers ()

(iii) negative whole numbers ()

(iv) positive whole numbers ()

(e) In C language, FILE is of which type?

- (i) int ()
- (ii) char* ()
- (iii) struct ()
- (iv) None of the above ()

(f) Functions that are used in the programs and are defined by the programmers are called

- (i) program layout ()
- (ii) program procedure ()
- (iii) built-in functions ()
- (iv) user-defined function ()

(g) If p is a variable of type struct point, how would you access its x member?

- (i) $p \rightarrow x$ ()
- (ii) $p \cdot x$ ()
- (iii) $*p \cdot x$ ()
- (iv) $sp \cdot x$ ()

(h) What is the result of the expression `ptr++` in C, where `ptr` is a pointer?

(i) Increase the value of `ptr` by 1 ()

(ii) Decrease the value of `ptr` by 1 ()

(iii) Move `ptr` to the next memory location ()

(iv) It's not a valid operation ()

(i) The minimum number of fields with each node of doubly linked list is

(i) 1 ()

(ii) 2 ()

(iii) 3 ()

(iv) 4 ()

(j) Which of the following is used to read formatted input from a file in C?

(i) `gets( )` ()

(ii) `scanf( )` ()

(iii) `fscanf( )` ()

(iv) `read( )` ()

2. State whether the following statements are *True* or *False* by putting a Tick (✓) mark. 1×5=5

- (a) In C, the comparison operator `==` has higher precedence than the assignment operator `=`.

True () *False* ()

- (b) The union keyword allows multiple members to share the same memory location.

True () *False* ()

- (c) Using the `const` keyword makes a variable's value immutable, meaning it cannot be changed after initialization.

True () *False* ()

- (d) Binary file stores data in a human-readable text format.

True () *False* ()

- (e) Dynamic memory allocation is primarily used for fixed-size data structures.

True () *False* ()

3. Answer the following questions in short : $2 \times 5 = 10$

(a) What is linker and loader in C programming?

(b) Explain the concept of operator precedence and associativity in C.

(c) Explain break and continue statements.

(d) What is a recursive function?

(e) What is dynamic memory allocation?

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