

2026

COMPUTER SCIENCE — HONOURS

Paper : DSCC-2

(Problem Solving Using C)

Full Marks : 75

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

Answer **question no. 1** and **any three** questions from **Section-A** and **any five** questions from **Section-B**.

1. Answer **any five** questions :

2×5

- (a) Mention the role of the #define statement in C.
- (b) Why is '\0' necessary for a string in C? What happens if it is absent?
- (c) Differentiate between getch() and getche() in C with suitable examples.
- (d) Explain the difference between *p++ and (*p)++.
- (e) What is a function prototype? Why is it important in C?
- (f) Consider the following C code. Find the values of x, y, z and t after execution :
`int x = -1, y = 1, z = -1; int t = ++x || y++ && --z; printf("%d %d %d %d", x, y, z, t);`
- (g) What are the purposes of the argc and argv arguments in int main (int argc, char *argv[])?
- (h) Write C statements to swap two integers p and q without using a third variable.

Section - A

- 2. Explain briefly the different storage structures in C. 5
- 3. Differentiate between entry-control and exit-control loops, using example. 5
- 4. Differentiate between if-else and switch-case statements with suitable examples. 5
- 5. Compare parameter passing techniques of call by value and call by reference with an example. 5

Please Turn Over

(7617)

6. typedef struct

```
{
double A; // 8-byte
char B; // 1-byte
char C; // 1-byte
} InfoData;
int main(int argc, char *argv[])
{
//Calculate size of structure
printf("\n Size of Structure = %d\n\n", sizeof(InfoData));
return 0;
}
```

What will be the output? Give explanation with the answer.

5

Section - B

7. (a) Briefly discuss the bitwise operators used in C.
 (b) Write a code snippet in C to find whether a number is a square number or not.
 (eg. $16 = 4^2$).

6+4

8. (a) Explain implicit and explicit type conversion (type casting) in C with suitable examples.
 (b) Clearly differentiate between a syntax error, a logical error and a runtime error in C.
 (c) What will be output of the following program –

```
#include <stdio.h>

int main() {
int *ptr, a, b, c;
a=5; b=11; c=20;
ptr=&a; *ptr=c; ptr=&c;
a=*(&b); c=*ptr-a;
printf("%d", c);
return(0);
}
```

Show the values of the variables after execution of each statement.

3+3+4

9. (a) What is an enumeration (enum) in C? Explain its declaration and use with a suitable example.
 (b) What are the advantages of using enum instead of integer constants?
 (c) Discuss, with suitable examples, the functions used to compare two strings in a case-sensitive and a case-insensitive manner. 3+3+4
10. (a) Explain the actual and formal arguments of a function, using a suitable example.
 (b) Differentiate between a structure and a union with suitable examples.
 (c) Explain the difference between & and * operators in the context of pointers. 5+3+2
11. (a) What is the ternary (conditional) operator in C? Write a C program to find the largest of three integers using only the ternary operator.
 (b) Define an array. Write a C code snippet containing the function void large_small(int n, int arr[]) to find the largest and smallest elements in an array arr[] containing n elements. (2+3)+(1+4)
12. (a) What will be the output of the following C program codes? Justify your answers.
(Assume all necessary header files such as #include <stdio.h> are included)
- (i)

```
int main() {  
    int arr[] = {10, 20, 30, 40};  
    printf("%d\n", *(arr + 2));  
    return 0; }
```

(ii)

```
int main() {  
    int i = 0;  
    while (i++ < 5)  
        if (i == 3)  
            continue;  
    printf("%d\n", i);  
    return 0; }
```
- (iii)

```
void fun() {  
    static int count = 0;  
    count++;  
    printf("%d", count);  
}  
  
int main() {  
    fun(); fun(); fun(); return 0;  
}
```
- (b) What is the purpose of the fopen() and fclose() functions in C? Why is it necessary to close a file after completing file operations? (2×3)+4
13. (a) Explain the break, continue and goto statements with suitable examples.
 (b) Write a code snippet to check whether a given string is a palindrome using a function. 6+4
14. (a) Write a C program to remove specific line from a text file.
 (b) What is the difference between text files and binary files?
 (c) Write a C program to check whether a substring is present in a string without using built-in functions. 4+2+4