

2024

COMPUTER SCIENCE — HONOURS

Paper : DSCC-2

(Program 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** from **Section - A** and **any five** from **Section - B**.1. Answer **any five** questions :

2×5

- (a) How are derived data types different from primitive data types?
- (b) How does a 'switch' differ from an 'if' statement?
- (c) State the use of static variable in C.
- (d) Why should the 'goto' statement be avoided in C?
- (e) What are preprocessor directives in C?
- (f) Is there any difference between void pointer and null pointer? Explain your answer briefly.
- (g) How is an 'entry-controlled' loop different from an 'exit-controlled' one? Illustrate with an example.
- (h) What are the main symbols used in a flowchart?

Section - A

2. Write the output of the following code snippet, with proper explanation —

5

```

void func()
{
    int a = 10;
    static int b = 20;
    printf ("a = %d\t b = %d\n", ++a, ++b);
}

int main()
{
    func();
    func();
    return 0;
}

```

Please Turn Over

3. Write a C program to count the number of '0's in the binary representation of an integer using bitwise operator. 5
4. Write a C program to swap the contents of two variables using 'call by address' method, while giving supporting explanation. 5
5. With the help of an example, explain the workings of both 'break' and 'continue' statements. The example should have nested loop structure. 5
6. Describe the different storage classes in C, with suitable examples. 5

Section - B

7. (a) Write a C program to convert a line of text to its reverse case (i.e. small letters will be converted to capital, and vice-versa), without using any library functions. All punctuation symbols should remain as it is.
(b) What is a macro? Compare and contrast between macros and functions. 5+(2+3)
8. (a) How does a structure variable differ from an union variable?
(b) Write an algorithm to display whether an inputted number is Perfect or not [E.g.: 6 = 1+2+3, i.e. summation of all factors less than the number, yields the number itself].
(c) Describe any two limitations of using getchar() and scanf() functions for reading strings. 3+4+3
9. (a) How is calloc() different from malloc()?
(b) An integer array A[50] is stored from memory location 3150, then what will the address of A[12] be? Explain your answer.
(c) What is a bitwise operator? Explain each of them very briefly. 3+3+(1+3)
10. (a) Explain the working of strcmp() with suitable examples. How does strcmpi() differ from strcmp()?
(b) Void main (int argc, char *argv[]) — Explain the role played by 'argc' and 'argv' here.
(c) Explain implicit and explicit typecasting with example. (2+1)+(2+2)+3
11. (a) Give the output of the following code snippet, with supporting explanation —

```
main()
{
    printf ("\n%d\t%d\t%d", sizeof('7'), sizeof("7"), sizeof(7));
}
```


(b) Describe the workings of 'enum' through an example.
(c) Clearly differentiate between syntactical error, logical error, and exception. 2+3+5

12. (a) What are the properties of array? How array is initialised and accessed in C program?
(b) Write a C program to transpose a matrix. 5+5
13. (a) Create a structure for a student with attribute roll, name, subject1, subject2 and average. Take user input on that structure and create a function to find the average and display all values.
(b) Create a text file in C program and display the same. 5+5
14. (a) Write a code to create a single linked list and display it.
(b) Discuss about different file opening modes in C. 6+4
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