SRI SHAKTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY
COIMBATORE – 641 062
(Autonomous Institution)

B.E / B.Tech. DEGREE EXAMINATION, Nov/Dec 2023

First Semester- Computer Science and Engineering

21CS101 Computational Thinking and Problem Solving Using C (Regulation 2021)

Common to all Branches

Time : Three Hours   Maximum : 100 Marks

PART – A (Answer ALL questions)   **(20*0.5=10 Marks)**

1. Unit of computer which is capable of performing arithmetic, logical and data manipulation operations on binary numbers is called _____.

2. Storage of 1KB means the following number of bytes
   a) 1000 b) 1024 c) 1064 d) 1012

3. Find 1's complement of $(110111)_2$

4. In non-volatile memory, data is erased once power is turned off? a) True b) False

5. Point out the first step in C program building process.
   a) Compiling b) Assembling c) Linking d) Preprocessing

6. An algorithm represented in the form of diagrammatic representation is called_____.

7. The assembly code is converted into the machine code by _____.
   a) compiler b) assembler c) linker d)loader

8. Which of the following symbol in a flowchart are used to indicate all arithmetic process?
   a) Input/output b) Terminal c) Processing d) Decision

9. How many times will the following loop be executed? ch= 'b';
   while (ch>= 'a' && ch<= 'z')
   a) 20 b) 25 c) 26 d) 0

10. What does the ++ operator do in C when applied to a variable?
    a) Decrements by 1 b) Adds 1 c) Double the value d) Leave it Unchanged

11. Choose a C Conditional Operator from the list.
    a) ?: b) :? C) :; d) ::

12. How long does the following loop run?
    for(x=0;x=3;x++)
    a) 3 times b) 4 times c) forever d) never

13. The output of the following code will be

```
int main()
{
Char arr[]="Discovery channel";
printf("%s",arr);
return 0;
}
```
a) D b) Discovery channel c) Discovery d) Compile error

14. An array elements are always stored in sequential order in memory locations.
a) True b) False

15. The highest index of an array with 10 elements is _____
a) 5 b) 9 c) 10 d) 11

16. The output of printf ("%d", sizeof("Hello")); in c is _____
a) 8 b) 6 c) 4 d) 2

17. The scope of a function is limited to?
a) Current block b) Only function c) Whole file d) Directory

18. Functions in C can accept multiple parameters. True or False.

19. The default value of an uninitialized "static" variable in c is___
a)0 b)1 c)Undefined d)Garbage value

20. Which of the following is not a storage class specifier?
a) auto b) register c)extern d)volatile

PART – B (Answer ALL questions) (5*2=10 Marks)

21. Find 2's complement of a given number (11000011111).

22. Compute an algorithm to find the factorial of a given number

23. Distinguish between while and do while statement.

24. Design a C program to find the length of a string using string library function.

25. Elaborate the steps in writing a function in a program.

PART – C (Answer any five questions) (5*14=70 Marks)

26 (i) Describe in detail the Input-process-output concept with a neat sketch. 7

(ii) Compute an algorithm, flowchart and C program to find a given year is leap year or not. 7

27 (i) Convert (1305.375)10 decimal number to binary, octal, Hexadecimal. 10

(ii) Give the difference between primary and Secondary Memory. 4

2

28 (i) Design a c program to print the following pattern.   7

 1
 1 2
 1 2 3
 1 2 3 4

   (ii) Develop a C program to find the minimum and maximum element in an array.   7

29 (i) Write a C program to calculate grade of a student based on marks.   7

 If mark is less than 50, then grade is F
 If mark is greater than or equal to 50 and mark is less than 60, then grade is D
 If mark is greater than or equal to 60 and mark is less than 70, then grade is C
 If mark is greater than or equal to 70 and mark is less than 80, then grade is B
 If mark is greater than or equal to 80 and mark is less than 90, then grade is A
 If mark is greater than or equal to 90, then grade is O

   (ii) Construct a program in C to count the total number of alphabets, digits and special   7
 characters in a string.

30 (i) Compute a C program to print first 50 natural numbers using recursion.   7

   (ii) Simulate a simple calculator program using a switch case.   7

31 (i) Write an algorithm and draw a flowchart to find sum and average of 5 subject   7
 marks (S1,S2,S3,S4,S5).

   (ii) Illustrate the different classifications of user defined functions based on parameter   7
 passing and return type with examples.

32 (i) Write an algorithm and draw the flowchart to find greatest of 3 numbers.   7

   (ii) Write a C program to find sum of digits of a given number.   7

PART – D (Answer the questions) (1*10=10 Marks)

33 (a) Design an algorithm and C program to perform matrix multiplication.   10

(OR)

   (b) Elaborate Call by value and call by reference for swapping of two variables.   10