Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 40919

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2024.

Second/Third Semester

Electrical and Electronics Engineering

CS 3353 – C PROGRAMMING AND DATA STRUCTURES

(Common to: Electronics and Communication Engineering/Electronics and Instrumentation Engineering/Electronics and Telecommunication Engineering/Instrumentation and Control Engineering)

(Regulations 2021)

(Also Common to PTCS 3353 - ECE, EEE For Regulations 2023)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Mention any four primary Data types of C language.

2. Find the error in the expression.

   int k=0.5;

3. Define the syntax of structures.

4. Point out the drawback of array size declaration in the beginning of a program.

5. Define linked list.

6. What operation does 'isEmpty( )' function performs?

7. What are Binary trees?

8. Where do you use double hash?

9. Define insertion sort, Give an example.

10. Explain the term binary search.

PART B — (5 × 13 = 65 marks)

11. (a) Explain the different types of expressions and Statements in C programming.

Or

(b) (i) Write down a program to sort 30 numbers in ascending order in C programming. (8)

(ii) Explain Recursive functions. (5)

12. (a) (i) Discuss about pointers. (5)

(ii) Write a program to swap two numbers 10, 20 without using a third variable and by using pointers in C language. (8)

Or

(b) Elucidate the various operations that could be performed in managing files in C programming and a list of relevant functions that could be possibly explored.

13. (a) (i) Write a short note on singly and doubly linked list. (6)

(ii) Write a program to do insertion operation in the beginning of a doubly linked list. (7)

Or

(b) Elucidate the features of Queue ADT and also mention the functions that may be used in queues. Give necessary illustrations.

14. (a) (i) Explore the properties of binary trees. (7)

(ii) Explain the different tree traversal techniques. (6)

Or

(b) (i) Investigate the role of double hashing. (7)

(ii) Explain binary search trees. (6)

15. (a) Write a program for binary search with relevant Flow charts. Trace the algorithm for an array with 10 values.

Or

(b) Analyze the steps of Quick sort algorithm by taking a relevant examples.

PART C — (1 × 15 = 15 marks)

16. (a) (i) Your friend writes a C program to separate words present in a string "Good Morning Students" as shown below help him by completing the missing statements in the Program (Missing statements are indicated as ---------- in the program). (7)

```
#include<-------->
#include<stdlib.h>
int main( )
{
      char str1[---]= "Good Morning-----";
const char str[ ] = "", s[2]= " ";
char *part;
int counter=1;

part = strpart(str1, s);
while (part !=NULL)
{
printf("-----%d=%s\n", counter++,part);
part = strpart(NULL,s);
}
return 0;
}

Output of program

Part 1 = Good
Part 2 = Morning
Part 3 = Students
```

(ii) Write a C program to multiply two matrices of order m×p, p×n respectively. (8)

Or

(b) Write a C program that performs the following operations using inbuilt functions.

(i) Find the remainder of a division operation. (3)

(ii) Find the quotient of a division operation. (3)

(iii) Find the square of a number. (3)

(iv) Find the square root of a number. (3)

(v) Find the cube value of a number. (3)