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B. M. S. College of Engineering, Bengaluru - 560019

Autonomous Institute Affiliated to VTU

February / March 2024 Semester End Main Examinations

Programme: B.E. **Semester: I / II**
Branch: Common to all Branches **Duration: 3 hrs.**
Course Code: 21CC1ESPSP / 21CC2ESPSP **Max Marks: 100**
Course: Problem-Solving Through Programming

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

UNIT - I

1. a) Define network topology? Explain its types with neat diagram. **08**

   b) Write an algorithm and flowchart to find the circumference of a circle. **06**

   c) Evaluate the following expressions: **06**
   i. a=100/20<=10-5+100%10-20==5>=1! =20
   ii. 10! =10||5<4&&8

UNIT - II

2. a) Illustrate the working of nested if else statement with an example. **06**

   b) Explain the syntax of do-while loop. Write a 'C' program to find the factorial of a number using while loop. **08**

   c) Write a 'C' program to print the given pattern using suitable constructs. **06**

```
        1
      1   1
    1   2   1
  1   3   3   1
1   4   6   4   1
1   5   10  10  5   1
```

OR

3. a) Write any three differences between i) while and do-while loop ii) break and continue **06**

   b) Write a 'C' program to check the given number is palindrome or not. **08**

c) Write a 'C' program to print the given pattern using suitable constructs. **06**

```
    *
   * * *
  * * * * *
 * * * * * * *
* * * * * * * * *
```

UNIT - III

4. a) Explain the declaration and initialization of one-dimensional array with an example **06**

b) Given an array of size n=10 with the array elements as below **08**

2	5	8	12	16	23	38	56	72	91

Write a 'C' program to search the element 23 in the given array by using suitable search technique.

c) Write a 'C' program to implement string length, string concatenation and string compare. **06**

OR

5. a) List out the differences between binary search and linear search. **06**

b) Write a 'C' program to sort the elements of given array using selection sort. **08**

c) Write a 'C' program to find the transpose of a matrix. **06**

UNIT - IV

6. a) Explain function definition, function call and function declaration with an example. **06**

b) Define recursion. Write recursive program to generate Fibonacci series. **08**

c) Write a 'C' program to add two integer numbers 5 and 3 using user defined functions. **06**

UNIT - V

7. a) Consider two structures Employee (depended structure) and another structure called bank (outer structure). **10**

i. The structure bank has the data members like Bank_name, Bank_branch,Branch_code.

ii.The Employee structure is nested inside the structure bank and it has the data members like employee_id , name,basic_salary,net_salary.

iii.Compute net_salary of the employee using below formula:

net_salary=basic_salary+HRA+DA-PF

where,

- HRA is 10% of basic salary i.e,HRA=basic_salary*0.1;
- DA is 5% of basic salary i.e.,DA=basic_salary*0.05;
- PF is 12% of basic salary ie.,PF=basic_salary*0.12

b) Write a 'C' program to swap two numbers to illustrate both call by value and call by reference. **10**

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