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

Autonomous Institute Affiliated to VTU

August 2023 Semester End Make-Up Examinations

Programme: B.E. **Semester: I**
Branch: Common to all Branches **Duration: 3 hrs.**
Course Code: 22CS1ESPOP **Max Marks: 100**
Course: Principles of Programming in C **Date: 11.08.2023**

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

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

UNIT - I

1 a) Explain the basic organization of a computer with a neat diagram. **05**

b) Predict the output for the following code snippets. **05**

i)
```
#include<stdio.h>
int main()
{
    int a=0;
    a=5||2|1;
    printf("%d",a);
    return 0;
}
```

ii)
```
#include <stdio.h>
int main()
{
    int my var;
    printf("The value of my var is: %d",my var);
    return 0;
}
```

iii)
```
#include<stdio.h>
int main()
{
    int a=5;
    printf("%d", 12 + a++);
    printf("%d", 12 + ++a);
    return 0;
}
```

c) Evaluate the following expressions. **05**

i) a + 2 > b && !c || a != d && a-2 <= e, **Assume** a=11, b=6, c=0, d=7, e=5

ii) x * 2 + y / 5 – z * y, **Assume** x=3, y=5, z=7

iii) x * 5 && 5 || (b / c), **Assume** x=2.5, b=1, c= -1

d) Design a C program to read two positive integers, say M and N, check whether M is an exact multiple of N without using loops, and print suitable output messages. **05**

UNIT - II

2 a) Design a C program to calculate the roots of a quadratic equation using switch statement. **05**

b) Differentiate between break and continue statement. Design a C program to display the numbers between 0 to 30 which are not divisible 2. **10**

c) Design a C program to find the sum of series $1/1 + 2^2/2 + 3^3/3 + ... + n^n/n$. **05**

OR

3 a) Design a C program to calculate tax, given the following conditions: **05**

- If income is less than 1,50,000 then no tax
- If taxable income is in the range 1,50,001-3,00,000 then charge 10% tax
- If taxable income is in the range 3,00,001-5,00,000 then charge 20% tax
- If taxable income is above 5,00,001 then charge 30% tax

b) Design a C program to print the following pattern. **05**

```
1
22
333
4444
```

c) Differentiate between while and do while loop. Design a C program to read the numbers until -1 is encountered. Also count the negative, positive, and zeros entered by the user using while loop. **10**

UNIT - III

4 a) Write the definition and syntax for the following function terminologies. **10**

- Function declaration
- Function Definition
- Function Call

Design a C program using functions to convert degrees Fahrenheit into degrees Celsius and highlight the terminologies mentioned above.

b) What is the need for Arrays? Write the syntax for declaration and initialization of two-dimensional arrays. **05**

c) Given a sequence of integers, write a C program using arrays to find the number of distinct numbers in the sequence. The sequence need not be sorted. **05**

OR

5 a) Differentiate between Call by Value and Call by Reference. Develop a C program to swap the values of two variables using Call by Value and Call by Reference. Outline how both are different. **10**

b) Design a C program to find the transpose of a mXn matrix. **05**

c) Develop a C program to implement linear search. **05**

UNIT - IV

6 a) i) Design a C program to convert characters of a string into lowercase without using built-in functions. **10**

ii) Develop a C program to concatenate two strings without using built-in functions.

b) Write a C program using structures to read, write and compute the average salary of the employees, and list the employees earning a salary above and below the average salary for a department of N employees. The employee has eno, ename, eDOB and esalary. Consider Employee DOB as a nested structure. **10**

UNIT - V

7 a) What is a pointer? Mention the syntax for pointer declaration and initialization. Develop a C program using pointers to compute the sum, mean and standard deviation of all the elements stored in an array of N real numbers. **10**

b) List the steps supposed to be followed to use files in C. Develop a C program to compare two files to check whether they are identical or not. **10**

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