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(2125)

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MCA 1st Semester Examination
Programming Methodologies (C, C++) (CBS)
MCA-101

Time : 3 Hours

Max. Marks : 60

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Candidates are required to attempt live questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E.

SECTION - A

1. (a) Define an Algorithm. Write difference between Algorithm and Flow Chart.
(b) What are various features of Object Oriented Programming? Explain. (2×6=12)
2. (a) What do you understand by modular programming? Does modular programming affect computation time? Explain.
(b) What are different storage classes in C? Explain briefly. (2×6=12)

SECTION - B

3. Explain call by value and call by reference with suitable example(s). Hence show that call by reference can return multiple values at a time. (12)

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4. (a) Explain the working of **while** and **do-while** loop control with the help of flow chart.
(b) Write a program to get the length and breadth of rectangle from user and find whether the area of the rectangle is greater than its perimeter. For example, the area of the rectangle with length = 5 and breadth = 4 is greater than its perimeter. (2×6=12)

SECTION - C

5. (a) Write a recursive function to obtain the running sum of first 25 natural numbers.
(b) What is macro? How macro is different from function? (2×6=12)
6. Twenty-five numbers are entered from the keyboard into an array. Write a program to find out how many of them are positive, how many are negative, how many are even and how many odd. (12)

SECTION - D

7. (a) While purchasing certain items, a discount of 10% is offered if the total price of the items purchased is more than 10000. If quantity and price per item are input through the keyboard, write a program to calculate the total expenses.
(b) Write the difference between structure and union. With the help of an example, explain how storing an element in a structure is different from storing it in union? (2×6=12)
8. There is a structure called employee that holds information like employee code, name, and date of joining. Write a program to create an array of the structure and enter some data into it. Then ask the user to enter current date. Display the names of those employees whose tenure is 3 or more than 3 years according to the given current date. (12)

SECTION - E

9. (a) What is a typedef in C language?
- (b) Can an array of pointers to strings be used to collect strings from the keyboard? If not, why?
- (c) How many bytes in memory would be occupied by the following array of pointers to strings? How many bytes would be required to store the same strings, if they are stored in a two-dimensional character array?

```
char *mess[ ] = {
    "Hammer and tongs",
    "Tooth and nail",
    "Spit and polish",
    "You and C"
};
```

- (d) What will be output if following C code is executed? Also explain your answer.

```
#include<stdio.h>
main()
{
    int a=30, b=40, x;
    x=(a!=10) &&(b==50);
    printf("%d",x);
}
```

- (e) What will be the value of s if-
 $a = 20, b = 3, c = -4$
 $s = a * b * c / 100 + 32 / 4 - a \% b$

- (f) What will be output if following C code is executed? Also explain your answer.

```
#include<stdio.h>
main()
{
    float x= 12.25, y=13.65;
    if(x=y)
        printf("x and y are equal");
    else
        printf("x and y are not equal");
} (6×2=12)
```