3E1204

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B.Tech. III-Semester (Main/Back) Examination, January - 2025

Artificial Intelligence and Data Science

3AID4-06 Object Oriented Programming

AID, CAI, CS, IT

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

Attempt all Ten questions from Part A, Five questions out of Seven questions from Part B and Three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No.205)

PART - A

(Answer should be given upto 25 words only)

All questions are complusory. **(10×2=20)**

1 Compare C and C++.

2. Explain class and struct with their differences.

3. Find the bugs in the following programs.

```
Class num
{ int x;
    Public : num (int k) { x=k;}
int operator +(num n)
    { num s(o);
    s. x = x–n.x;
    return x ;
    }
};
    void main ()
{ num a(1), b (5), c(o);
    c = a+b; }
```

4. What do you mean by base class and derived class?
5. What is the use of the keyword virtual ?
6. What are the steps involved in using a file in a C++ program?
7. Distinguish Data abstraction and data encapsulation?
8. How does a main () function in C++ differ from main in C?
9. When will you make a function inline? Why?
10. Distinguish between the following two statements:

    time T2 (T1);

    time T2=T1;

    T1 and T2 are objects of time class.

PART - B

(Analytical/Problem solving questions)

Attempt any Five questions. **(5×4=20)**

1. What is object oriented programming ? How it is different from procedure oriented programming?
2. Find error, if any, in the following C++ statement

    a) Cout << "x = "x ;

    b) Cin >> x; >> y;

    c) Cout << "Enter value:"; cin >> x;

    d) m=5; || n=10; || s=m+n;

3. What are the advantages of function prototypes in C++? Write a function to read a matrix of size m×n from the keyboard.

4. What is a friend function ? What are the merits and demerits of using friend function?

5. What is a constructor? Is it mandatory to use constructors in a class? List some of the special properties of the constructor functions.

6. What is operator overloading ? Why is it necessary to overload an operator?

7. What are nested classes? What is the difference between private and protected access specifiers?

PART - C (3×10=30)

(Desriptive/Analytical/Problem Solving/ Design question)

Attempt any Three questions.

1. What do you mean by inheritance ? Describe the various types of inheritance with examples. Write the difference between single and multilevel inheritance.

2. What is a file? Write steps of file operations. Write a program to write and read text in a file. Use of stream and ifstream classes.

3. What is this pointer? Write a program to enter name and age of two persons. Find the elder person use this pointer.

4. What is the difference between operator overloading and function overloading? Write a program to overload < operator and display the smallest number out of two objects.

5. What is copy constructor ? Write a program to demonstrate the use of copy constructor.