3E1204

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B.Tech. III - Sem. (Main & Back) Examination, January/February - 2024

Artificial Intelligence & Data Science

3AID4-06 Object Oriented Programming

AID, CAI, CS, IT, CCS, CDS, CIT, CSD, CSR

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 up to 25 words only)

ALL questions are compulsory. **(10×2=20)**

1. Why do we need the pre-processor directive **# include < iostream** >?

2. What are the applications of **void** data type in C++?

3. What are objects ? How are they created?

4. What is parameterized constructor?

5. Describe the syntax of Operator function.

6. What is a virtual base class?

7. What are the application of **this** pointer?

8. What role does the **iomanip** file play?

9. What are input and output stream?

10. What is generic programming?

PART - B

(Analytical/Problem solving questions)

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

1. How does a constant defined by **const** differ from the constant defined by the pre-processor directive statement **#define**?

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

3. What do you mean by Dynamic initialization of ob objects?

4. A friend function cannot be used to overload the assignment operator **=**. Explain why?

5. Class D is derived from Class B. The class D does not contain any data members of its own? Does the class D require constructors? If yes, why?

6. When do we make a virtual function "pure"? What are the implications of making a function a pure virtual function?

7. A template can be considered as a kind of MACRO. Then, what is the difference between them?

PART - C

(Descriptive/Analytical/Problem Solving/Design question)

Attempt any THREE questions. **(3×10 =30)**

1 Write a class template to represent generic vector. Include member functions to perform the following tasks:

a) To create the vector

b) To modify the value of a given element

c) To multiply by a scalar value

d) To display the vector in the form (10, 20, 30.....)

2. Write a main program that calls a deeply nested function containing an exception incorporate necessary exception handling mechanism?

3. Write a program to print a table of values of the function $y = e^{-x}$.

4. Create a class **MAT** of size m*n. Define all possible matrix operations for **MAT** type objects?

5. Write a program that reads the Name "Rajasthan Technical University" from the keyboard in to three separate string objects and then concatenate them into a new **string** object using + operator?