JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST -1 EXAMINATION- 2024
B.Tech-III Semester (CSE/IT)

COURSE CODE (CREDITS): 18B11CI311 (3) **MAX. MARKS:** 15
COURSE NAME: Object-Oriented Systems and Programming **MAX. TIME:** 1 Hour
COURSE INSTRUCTORS: Dr. Amol Vasudeva, Dr. Deepak Gupta, Dr. Hari Singh, and Dr. Maneet Singh

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Note: *(a) All questions are compulsory. (b) Marks are indicated against each question in square brackets. (c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems*

Q 1. Define a class **Distance** in C++ with two private data members as **feet** and **inches**. The class only includes the following constructors.

- A no-argument constructor can initialize **dist4** object with data members as **feet = 0** and **inches = 0.**
- A two-argument constructor can initialize data members of **dist2** object to values passed as arguments, e.g. **dist2 (6, 10)**
- A one argument constructor that takes a **float** value and converts it into **feet** and **inches**, e.g. **dist1 = 5.25** is converted into **5 feet** and **3 inches**
- A copy constructor that initializes **dist3** object to the values assigned to data members of **dist1** object

Write a main() function that is suitable to the above requirements. (CO-2) **[4 marks]**

Q 2. Define a class **Array** in C++ that consists of two data members as: **int size** and **int* a**. The class consists of a constructor having one parameter to pass the size of the array. This constructor allocates the space for array dynamically. Also, define a destructor to de-allocate the object space. The class also have two member functions **enter()** and **display()** to enter and display the elements of the array. In the main function, define a dynamic object of the **Array** class; call the **enter()** and **display()** functions; and call the destructor to destroy the object. (CO-2) **[4 marks]**

Q 3. Write a C++ program having two classes – **A** and **B** and a friend function having the following prototype to calculate the total number of objects in both classes: (CO-3) **[4 marks]**

friend void countTotalObjects (const A&, const B&)

Q 4.

a) How does the concept of encapsulation contribute to data security and integrity in object oriented programming? Explain in detail. (CO-1) **[1.5 marks]**

b) Write at least five major differences between Call-by-Pointer and Call-by-Reference in C++. (CO-1) **[1.5 marks]**