

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- 2023

M.Tech-I Semester (ECE)

COURSE CODE (CREDITS): 21M11EC113 (3)

MAX. MARKS: 35

COURSE NAME: OBJECT ORIENTED PROGRAMMING

COURSE INSTRUCTORS: EMP

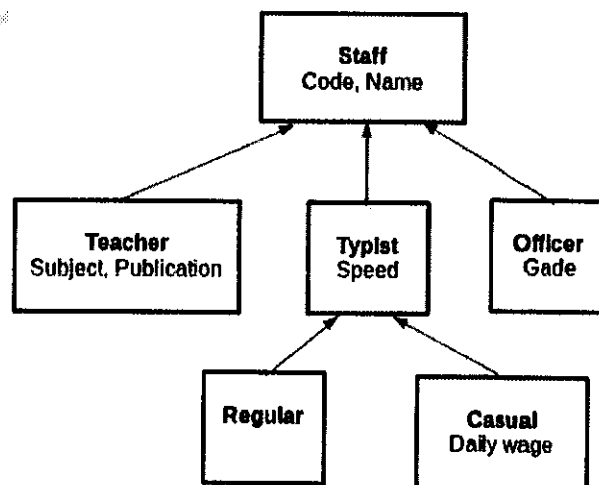
MAX. TIME: 2 Hours

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

- Q1. Describe the purpose and usage of the "main" method in a Java program. [CO5, 2M]
- Q2. What is an object-oriented programming language, and how does Java exemplify the principles of object-oriented programming (OOP)? [CO3, 3M]
- Q3. Examine the concept of interfaces in Java and discuss their role in achieving multiple inheritance. Provide examples to illustrate how interfaces contribute to the flexibility and extensibility of Java programs. [CO5, 5M]
- Q4. Examine the Java Thread class and Runnable interface as fundamental components of multithreaded programming. Illustrate their usage in creating and managing threads, and discuss the benefits of using each approach. [CO5, 5M]
- Q5. Define a class Vector in Java with data members x_axis and y_axis. Define member function to add and subtract two vectors. Also, define member function to display the object. Test your class in the main function. [CO5, 5M]
- Q6. Implement the class hierarchy as shown in the following figure using Java. The class name and attributes are given in figure. Assume suitable methods for each class. [CO3, 5M]



Q7. Discuss the role of class templates in supporting generic programming in C++. How do class templates differ from function templates, and what advantages do they offer in creating generic data structures and algorithms? Provide practical examples. [CO5, 5M]

Q8. Find the output of the following Python program snippets. [CO4, 5M]

(i)

```
n = [1, 2, 3, 4]
nn= [x * 2 for x in n if x % 2 == 0]
print(nn)
```

(ii)

```
add = lambda x, y: x + y
result = add(3, 5)
print(result)
```

(iii)

```
class A:
    def __init__(self):
        self.value = 1
class B(A):
    def __init__(self):
        self.value = 2
```

```
obj = B()
print(obj.value)
```

(iv)

```
sq = (x * x for x in range(5))
result = sum(sq)
print(result)
```

(v)

```
i = 0
while i < 5:
    print(i)
    i += 1
    if i == 3:
        break
else:
    print(0)
```