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Course Code: MCA-205 Course Name: Java Programming

Class Test 1

Time: 1 Hour Max Marks: 20

1. Identify classes, construct project hierarchy and create business logic for the following scenario in JAVA. 5 marks

Hourly Pay Calculator

Foo Corporation needs a program to calculate how much to pay their hourly employees. The US Department of Labor requires that employees get paid time and a half for any hours over 40 that they work in a single week.

For example, if an employee works 45 hours, they get 5 hours of overtime, at 1.5 times their base pay. The State of Massachusetts requires that hourly employees be paid at least $8.00 an hour. Foo Corp requires that an employee not work more than 60 hours in a week.

Summary of Rules

- An employee gets paid (hours worked) × (base pay), for each hour up to 40 hours.
- For every hour over 40, they get overtime = (base pay) × 1.5.
- The base pay must not be less than the minimum wage ($8.00 an hour).
- If it is, print an error. If the number of hours is greater than 60, print an error message.

Create a new class called FooCorporation. Write a method that takes the base pay and hours worked as parametersand prints the total pay or an error. Write a main method that calls this method for each of these employees:

	Base Pay	Hours Worked
Employee 1	$7.50	35

Employee 2	$8.20	47
Employee 3	$10.00	73

2. Implement the traditional **producer consumer problem** using multi-threading in java. 5 marks

   In computing, the producer–consumer problem (also known as the bounded-buffer problem) is a classic example of a multi-process synchronization problem. The problem describes two processes, the producer and the consumer, which share a common, fixed-size buffer used as a queue.

   - The producer's job is to generate data, put it into the buffer, and start again.
   - At the same time, the consumer is consuming the data (i.e. removing it from the buffer), one piece at a time.
   - To make sure that the producer won't try to add data into the buffer if it's full and that the consumer won't try to remove data from an empty buffer

3. Analyze and comment what will be the output of the following Java Program. 2 marks

```
public class Test {
   public static void main(String[] args) throws Exception {
      char[] chars = new char[] {'\u0097'};
      String str = new String(chars);
      byte[] bytes = str.getBytes();
      System.out.println(Arrays.toString(bytes));
   }
}
```

4. Identify statement is not true in java language? 2 marks

   1. A public member of a class can be accessed in all the packages.
   2. A private member of a class cannot be accessed by the methods of the same class.
   3. A private member of a class cannot be accessed from its derived class.
   4. A protected member of a class can be accessed from its derived class.

5. Briefly describe the following:- 3*2=6 marks

1. Java Beans
2. TCP Sockets
3. Oracle Thin Client

********** **Wish you luck!** **********