BITS, Pilani – K K Birla Goa Campus		
CS F213 **Object Oriented Programming** (CB)	Sem 1 2022-23 Mid Sem Exam	**25% (50 Marks)** **November 1st , 2022 (9:00-10:30 AM)**

INSTRUCTIONS: (1) Write your name and ID number in the spaces provided. **(2)** No overwriting or canceling is allowed. ***(3) Answers written anywhere other than space provided will not be considered for evaluation.***(5) There are 10 questions in this paper. (6) Code should be **minimum** Java code using all relevant library methods. Assume the existence of setter/getter method unless specified.

Name:													
ID.No.	2	0											G

Q1. Give T/F for the following **[Marks 2]**

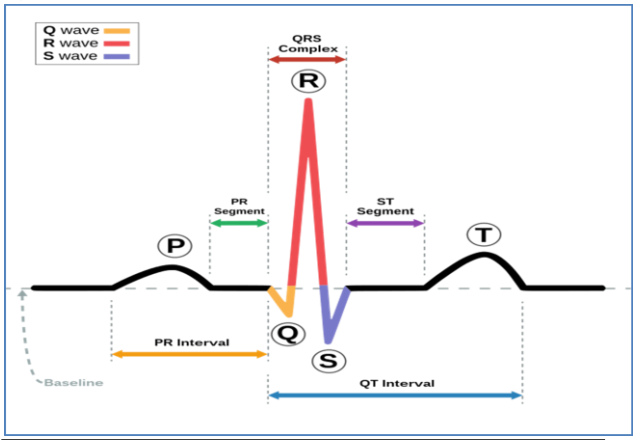
a) Which of the following is true about methods in an interface in java?

1. An interface can contain only abstract method.
2. We can define a method in an interface
3. Private and protected access modifiers can also be used to declare methods in interface

b) Which of the following is true about static Nested Class in java?

1. A class is nested in an Interface is always Static
2. Nested Static class can implement an interface
3. Static Nested class can be extended

Q3-8 will be about Health and ECG



t0 t1 t2 t3 t4 t5 t6

Q2. Will the following code execute? If yes, give the output. If no, give the line causing error **Marks [2]**

```
class CodeA
{   { System.out.print("C");   }
   public String type = "A ";
   public CodeA() {
      System.out.print("CodeA ");
   }
}

public class Main extends CodeA
{     { System.out.print("D");      }

   public Main() {
      System.out.print("CodeB ");
   }

   void go()
   {  type = "B ";
      System.out.print(this.type + super.type);
   }
    public static void main(String[] args)
   {       new Main().go();    }
}
```

Q2.

ID.No.	2	0											G

Q3. Give complete code to do all of the following. **[Marks 5]**

a) A class **ECG** should be created in the **health** package

b) ECG will have a constructor with four int and one double argument:

c) Set an Integer array **peakVal** with the numeric value of first four arguments passed during execution (use java method for type conversion)**.**

d) Set an double variable **strtTime** with the numeric value of the fifth argument.

e) ECG will have a second constructor with one ECG object as an argument. Ensure that the second constructor calls the first constructor and no lines are code are duplicated.

Q4. Given the Eatable interface below. Give complete code for a class **CalEatable** which

a) Creates an Eatable object **et** using an **anonymous Inner class.**

b) Executes the eat() method to produce the output 100 if s is "Apple", 200 if s is "Banana". 0 if s is any other string **[Marks 6]**

```
interface Eatable{
        int  eat(String s);  }
```

Q4.

Q3.

Q5. Give code for a class **EatCompare** which implements the **Comparable** interface. It will have a String foodString. Comparison will be done using the return value of **CalEatable** when foodString is passed. **[Marks 4]**

ID.No.	2	0											G

Q5

Q6. Give relevant Java code for an abstract class **AbsECGT** which will have **[Marks 6]**

i) It should have an abstract method g**etInterval(double [] arr)** which returns a double array.

ii) It should have an abstract method **getInterval(Queue qu)** which returns a double array. (Queue was defined in the lab question).

Q6.

Q7. Create complete concrete subclasses of **AbsECGT** class follows. **[Marks 14]**

i) **ECGT** class which implements both getInterval methods. The methods will take as an input t0, t1… t6 in an Array or Queue. They will return the values for PRInterval, PRSegment, QRSComplex, QTInterval and ST segment in an array.

ii) **ECGTAnalysis** which is a subclass of ECGT class. It will have a boolean field **status.** It implements **getStatus(Object obj)** method which will

a. Check if obj is an Array: call getInterval with array argument else obj is a Queue:call with Queue argument. Set status to true.

b. If obj is any other type, set status to false.

ID.No.	2	0											G

Q7.i)

Q7 ii).

ID.No.	2	0											G

Q8. Give complete code for **ECGUser** class which will: (Assume all inputs required are available). **[Marks 6]**

i) Create Objects of **ECG** and **ECGTAnalysis** class ecg and ecga respectively

ii) Has an Object array with first element ecg, second element ecga and third element with a double value equal to third element of **peakVal** multiplied with QRSComplex.

Q8.

Q9. Give the Class diagram for all classes and interfaces used in questions 3 to 8 at the back of this page. **[Marks 5]**

ID.No.	2	0											G

Q9.