Foundations of Programming (Java) 2004 Paper 10 Question 3 (FHK)

The test program below includes all the code that the candidates are asked to provide:

(a) class Mark contains the two required constructors. [4 marks]

(b) The two methods getCount() and getMean() are required for the second part. [9 marks]

(c) the method getRank() is slightly more challenging and the version below does the job. [7 marks]

Note that the candidates are not asked to augment the method with code that throws exceptions in the special cases.

```
public class Exam
 { private static Mark[] question = {new Mark(8), new Mark(), new Mark(6)};

   private static int getCount(Mark[] q)
    { int count = 0;
      for (int i=0; i<q.length;i++)
       { if (q[i].attempted) count++;
       }
      return count;
    }

   private static double getMean(Mark[] q)
    { int sum = 0, n = 0;
      for (int i=0; i<q.length;i++)
       { if (q[i].attempted)
  { sum += q[i].score;
    n++;
          };
       }
      if (n>0)
       { return (double)sum/n;
       }
      else
       { return -1d;
       }
    }

   private static int[] getRank(Mark[] q)
```

```
    { int[] rank = {0,0,0,0,0,0,0,0,0,0,0};
      for (int i=0; i<q.length;i++)
       { if (q[i].attempted) rank[q[i].score]++;
       }
      int acc = 0;
      for (int i=10;i>=0;i--)
       { int temp = acc + rank[i];
         rank[i] = acc;
         acc =temp;
       }
      return rank;
    }

   public static void main(String[] args)
    { System.out.println("Count is " + getCount(question));
      System.out.println("Mean is " + getMean(question));
      int[] rk = getRank(question);
      for (int i=0; i<=10; i++)
       { System.out.println(rk[i]);
       }
    }
 }

class Mark
 { public boolean attempted;
   public int score;

   public Mark()
    { this.attempted = false;
    }

   public Mark(int s)
    { this.attempted = true;
      this.score = s;
    }
 }
```