Beijing Jiaotong University

2021—2022 School Year Second Semester Exam (A)

Course Name: Software Quality Assurance and Testing Techniques

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Class:_____ Name:_____ Student ID:_____

No.	1	2	3	Total Score
Score				
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Part 1. Black Box Testing and Test cases Design. (5*6=30 marks)

If you take the train before 9:30 AM or in the afternoon after 4:00 PM until 7:30 PM (‘rush hour’) you must pay full fare. A saver ticket is available for trains between 9:30 AM and 4:00 PM, and after 9:30 PM.

Q1: What are the partitions and boundary values to test the train times for this ticket types?

Q2: Which are valid partitions and which are invalid partitions?

Q3: What are the boundary values? (A table may be useful)

Q4: Design test cases for the partitions and boundaries.

Q5: Do you have any questions about this ‘requirement’? Is anything unclear?

Part 2. White Box Testing and Test cases Design. (20*2=40 marks)

Now we have two code written by some programmers which are shown below, please provide the Control Flow Testing process of each code, including **Control Flow Graph, Cyclomatic complexity and Basis Set. And you can report the bugs if you find any.**

Q1:

```
1   int main() {
2       int i;
3       double number, sum = 0.0;
4       for (i = 1; i <= 10; ++i) {
5           printf("Enter a n%d: ", i);
6           scanf("%lf", &number);
7           if (number < 0.0) {
8               continue;
9           }
10          sum += number;
11      }
12      printf("Sum = %.2lf", sum);
13      return 0;
14  }
```

Q2:

```
1   public static void main(String[] args) {
2                   File f = new File("ciaFactBook2008.txt");
3                   Scanner sc;
4                   sc = new Scanner(f);
5                   Map<String,Integer>wordCount=newTreeMap<String,Integer>();
6                   while(sc.hasNext()) {
7                       String word = sc.next();
8                       if(!wordCount.containsKey(word))
9                           wordCount.put(word, 1);
10                      else
11                          wordCount.put(word, wordCount.get(word) + 1);
12                  }
13                  for(String word : wordCount.keySet())
14                      System.out.println(word + " " + wordCount.get(word));
15                  System.out.println(wordCount.size());
16              }
```

Part 3. Understanding of Testing. (5*6=30 marks)

Q1: Please put the test cases that implement the following test conditions into **the best order** for the test execution schedule and **explain why**, for a test that is checking modifications of customers on a database.

1) Print modified customer record
2) Change customer address: House number and street name
3) Capture and print the on-screen error message
4) Change customer address: Postal code
5) Confirm existing customer is on the database by opening that record
6) Close the customer record and close the database
7) Try to add a new customer with no details at all

Q2: Why are **both behavioral testing** (specification-based testing) and **structural testing** (structure-based testing) techniques useful?

Q3: What are the key characteristics of **structural testing** (structure-based testing) techniques?

Q4: What are the differences of **Unit Testing, Integration Testing, System Testing,** and **Acceptance Testing**?

Q5: What are the differences of **Software Quality Assurance** and **Software Quality Control**?