**Software Validation and Quality Assurance: Mid Term II Sample Questions**

**PART I Multiple Choice Questions**

1. Choose the correct coverage-based prioritization of the following test cases with additional strategy. Numbers following a test cases are the index of statements covered by it.

Test Cases:

T1: 1, 3, 6, 7, 8

T2: 2, 3, 6, 9

T3: 3, 4, 5

T4: 2, 4, 5, 7

A. T1, T2, T4, T3

B. T1, T4, T2, T3

C. T1, T3, T4, T2

D. T4, T1, T2, T3

Answer: B

2. In performance testing, which of the following tests a software system by providing heavy input load (slightly under designed maximal load) for a long time?

A. Spike testing

B. Soak testing

C. Stress testing

D. Load Testing

Answer: B

3. Considering an input x, whose type is unsigned 8 bit integer (range: 0-255), in adaptive random testing, if the first input generated randomly is 100, what will be the next 4 inputs?

A. 255, 0, 177, 50

B. 0, 255, 50, 177

C. 200, 0, 150, 50

D.0, 177, 50, 255

Answer: A

4. Which statement below about buffer overflow is CORRECT?

A. You do not need to do boundary check for small-size buffers, because overflow on these buffers cannot be exploited

B. Attackers can exploit buffer overflows mainly by covering function arguments in the call stack with user input

C. Buffer overflows cannot be exploited in type-safe languages such as Java

D. If a buffer is not directly written by user inputs, it cannot be exploited by attackers even if buffer overflow happens.

Answer: C

**PART II Questions and Answers (33 points)**

1. Consider a program that takes a set of integer as its input, and the test case {1, 2, 3, 4, 5, 6, 7, 8} reveals an error. Assuming that the error will happen only when 1, 4, 8 are in the input simultaneously. Describe the process of delta debugging to minimize the error-revealing input to {1, 4, 8}. (9 points)

1, 2, 3, 4, 5, 6, 7, 8 F

1, 2, 3, 4 P

 5, 6, 7, 8 P

1, 2, 3, 4, 5, 6 P

1, 2, 3, 4 7, 8 F

1, 2, 3, 4 7 P

1, 2, 3, 4 8 F

1, 2 8 P

 3, 4 8 P

1, 2, 3 8 P

1, 2 4 8 F

1 4 8 F

2. Find coding style (including comments) errors in the following code portion (8 points, find 8 or more errors to get full points)

Code Portion:

 public int f(String str, int value1, int value2){

 //calculate str1 and str2 based on the formula

 String str1 = str.substring(value1);

 String str2 = str.substring(value2);

 String resultforprint = str1 + str2; //concatenate str1 and str2

 UI.initialize(); //initialized UI

 UI.sendMessage("Header"); //Send message "Header" to UI

 UI.sendMessage(resultforprint); int diff;

 …

 //if value1 larger than 10 and the diff of value2 and value1 is not 5,

 //or value2 is larger than 100, send the diff

 if(value1>10&&diff=(value2-value1)!=5||value2<100)

 UI.sendMessage("The diff is "+ diff);

 UI.sendMessage("Footer");

 while(!this.comingMessage)

 UI.sendMessage("Waiting for next message");

 this.count = this.count + 1;

 if(UI.success)

 return 0; //return 0 if UI.success is true

 return 1;

 }

(1) Line 1 meaningless identifier

(2) Line 2 comment does not provide any additional information

(3) Lines 5-6 wrong indentation

(4) Lines 5-6 should separate logic blocks

(5) Line 7 string constants should not go to GUI

(6) Line 8 multiple statements in one line.

(7) Line 12 too long expressions

(8) Line 12 constants should have names