PMSCS Program

Department of Computer Science and Engineering

Jahangirnagar University

Final Examination: Summer-2020

Course Title: ***Software Testing*** Course Code: **PMSCS-670**

Time: **1 Hour 30 Minutes**. Full Marks: **30**

[There are 4(**Four**) questions. Answer any 3(Three) questions. Each question carries equal marks. Figures in the right margin indicate marks.]

1. a) Define graph. Write down the set representation of the graph mentioned in Figure-1. 2

   b) Draw the control flow graph for each of the following code snippet. 3

```
x = 0;
while (x < y)
{
  y = f (x, y);
  if (y == 0)
  {
    break;
  } else if (y < 0)
  {
    y = y*2;
    continue;
  }
  x = x + 1;
}
```

(i)

```
/**
   * Return index of node n at the
   * first position it appears,
   * -1 if it is not present
*/
public int indexOf (Node n)
{
 if(n!=null)
 {
    for (int i=0; i < path.size(); i++)
        if (path.get(i).equals(n))
            return i;
   }
     return -1;
}
```

(ii)

```
read ( c) ;
switch ( c )
{
  case 'N':
    z = 25;
  case 'Z':
    z += 20;
  case 'Y':
    x = 50;
    break;
  default:
    x = 0;
    break;
}
```

(iii)

   c) Define detour and def-clear path with appropriate example. 2

   d) Define *def* and *use*. How can we determine the *defs* of a particular variable from the source code? 3

2. a) Define each of the followings: 3

   i. Error
   ii. Failure
   iii. Mutation Testing
   iv. Happy Path Testing
   v. Stress Testing
   vi. Regression Testing

   b) Give a comparison between functional testing and non-functional testing. 3

   c) With necessary diagram briefly describe the software testing V-Model. 4

3. a) Define input domain. Write down the properties of domain partitioning. 1.5

   b) Define Coverage Criteria. Write down the advantages of Input Space Partitioning. 1.5

c) Use the following characteristics and blocks for the questions below. 3

Characteristics	Block 1	Block 2	Block 3	Block 4
Value 1	< 0	0	> 0	
Value 2	< 0	0	> 0	
Operation	+	−	×	÷

Table-I

i. Give test cases to satisfy the Each Choice criterion.

ii. Give test cases to satisfy the Base Choice criterion. Assume base choices are `Value 1 = > 0`, `Value 2 = > 0`, and `Operation = +`.

iii. How many tests are needed to satisfy the Pair-wise Coverage criterion?

d) Briefly describe the five steps of input domain modeling. 4

4. a) Define Logic Coverage. Write down the sources of logic expressions and predicates. 2.5

b) Define determination in logic coverage. For the logic expression, $\boldsymbol{p} = (\boldsymbol{x} \wedge \boldsymbol{y}) \vee (\boldsymbol{x} \wedge \neg \boldsymbol{y})$ show that only *clause* x determines the predicate. 2.5

c) Give a comparison between CACC and RACC. 2

d) Consider the following graph: 3

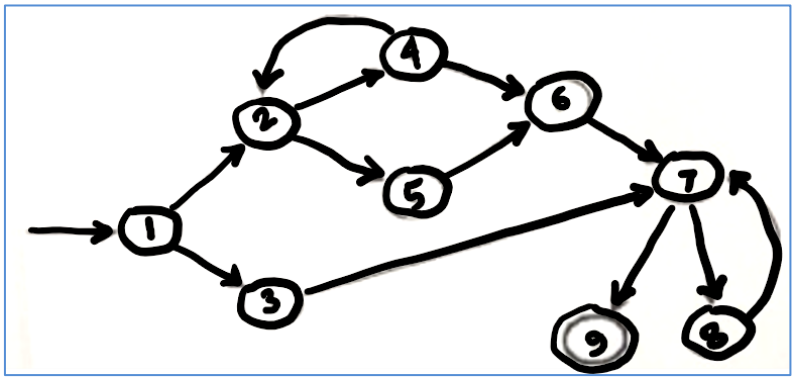

Figure-1

Now write down the test requirements and test paths for each of the following criteria:

i. Edge Coverage

ii. Node Coverage

iii. Edge-pair Coverage

--o--