PMSCS Program

Department of Computer Science and Engineering

Jahangirnagar University

Final Examination: Spring-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) Give a comparison between testing and debugging 3

   b) Distinguish between Stress Testing and Load Testing. Write down the principles of software testing. 3

   c) Define Coverage Criterion. With necessary diagram briefly describe the MDTD activities. 4

2. Consider the following information about a graph and answer each of the followings

$N = \{1, 2, 3, 4, 5, 6, 8\}$
$N_o = \{1\}$
$N_f = \{8\}$
$E = \{(1,2), (2,3), (2,8), (3,4), (3,5), (4,3), (5,6), (5,7), (6,7), (7,2)\}$
$\text{def}(1) = \text{def}(4) = use(6) = use(8) = \{x\}$

   a) Draw the graph. 2

   b) List all the du-paths with respect to *x*. 2

   c) List a minimal test set that satisfies all uses coverage with respect to *x*. 3

   d) List a minimal test set that satisfies all-du-paths coverage with respect to *x*. 3

3. a) Define predicate and clause. 2

   b) Consider the logic expression, $p = ((a < b) \vee D) \wedge (m >= n * o)$ and answer the followings: 2

      i) List down the clauses

      ii) Determine any test cases for clause coverage.

   c) Define predicate coverage (PC) and combinatorial coverage (CoC). 2

   d) Determine the CACC and RACC pairs of the clauses for the following logic expression: 4

$$p = (\neg a \wedge \neg b) \vee (a \wedge \neg c) \vee (\neg a \wedge c)$$

4. a) Assume that, while doing ISP we found three characteristics $\{A, B, C\}$ and each of the characteristics are partitioned into blocks of different sizes $\{(A1, A2), (B1, B2, B3), (C1, C2, C3, C4)\}$. 3

   Now, answer each of the following questions:

   i) How many test cases we will get for all combination coverage?

   ii) How many test cases we will get for pair-wise coverage?

   iii) How many test cases we will get for base choice coverage?

b) Define input domain. Consider the following code segment: 3

```
public boolean findElement (List list, Object element)
// Effects: if list or element is null throw NullPointerException
//  else return true if element is in the list, false otherwise
```

Now, give an example of partitioning scheme that will satisfy the following characteristic constraints for the above code snippet and highlight the criteria:

i) A block from one characteristic cannot be combined with a specific block from another.

ii) A block from one characteristic can ONLY BE combined with a specific block form another characteristic.

c) Define each of the followings with an appropriate example: 4

i) Node Coverage

ii) Prime Path

iii) Test Path

iv) T-wise Coverage

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