



**PMSCS Program**  
**Department of Computer Science and Engineering**  
**Jahangirnagar University**  
**Final Examination: Spring-2020**

Course Title: **Software Testing**

Time: **1 Hour 30 Minutes.**

Course Code: **PMSCS-670**

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

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

- 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,  $p = ((a < b) \vee D) \wedge (m \geq n * o)$  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  $\{(A1, A2), (B1, B2, B3), (C1, C2, C3, C4)\}$ .

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:

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```
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 from another characteristic.

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

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- i) Node Coverage
- ii) Prime Path
- iii) Test Path
- iv) T-wise Coverage

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