

**BITS ID:** .....

**Birla Institute of Technology & Science, Pilani**  
**AY2017-2018 Semester 1, Software Testing Methods (SS G552)**  
**Mid-Semester Examination, Oct 2017 (Closed Book)**

**Max Marks: 25M**

**Duration: 90 Minutes**

**INSTRUCTIONS:**

- **ALL questions are compulsory. The paper has total SIX (6) questions on TWO (2) printed pages.**
- **ANSWER ALL PARTS OF A QUESTION TOGETHER. FOLLOW THIS INSTRUCTION STRICTLY.**
- **DESPITE the CORRECTNESS of an answer, the QUALITY of the answer is an IMPORTANT EVALUATION criterion. Overwritten answers will not be entertained.**
- **WHILE DESIGNING A TEST SUITE FOR A GIVEN PROBLEM, PROVIDE SUITABLE TEST CASE EXAMPLES WITH APPROPRIATE VALUES.**
- **Write your BITS ID on the top corner of the paper.**

1. [1/2M\*2=1M] Mark the following as either True (T) or False (F). Justify your answer. Zero marks will be awarded with no justification of the answer.
  - (a) Validation techniques can be viewed as an attempt to achieve phase containment of errors.
  - (b) Endurance testing examines the pressures placed on the user during system use in extreme environments.
2. [2M] Differentiate between test cases and test scenarios. Which of them are designed first? Justify your answer.
3. [2M] Consider the following program fragment:
  1.  $x = 4;$
  2.  $y = x + 1;$
  3.  $z = y - 2;$
  4.  $w = x;$
  5.  $z = x + y;$Identify the static program slice with respect to criteria  $(5, \{z\})$ . Justify your answer.
4. [6M] Compute the BOR-constraint set for predicate  $p_r: (x < y) \vee (z > v - w) \wedge \neg p$ . Show all the steps used while computation. Based on the computed BOR-constraint set, derive the sample test cases satisfying the constraint set.
5. [7M] Consider the following requirements specification:  
*“Write a C program that finds maximum of the three distinct positive integer numbers X, Y and Z where each number is less than 100”.*

- (a) [5M] Correctly identify the causes and effects in the specification. Draw the cause-effect graph. Transform the generated cause-effect graph into a limited entry decision table step-by-step. Show all the steps with proper justifications. Identify the test suite from the decision table. Justify your test suite. Zero marks will be awarded with no/incomplete justification.
- (b) [2M] Design a test suite for the above requirements specification using Boundary Value Checking. Justify your test suite. Zero marks will be awarded with no/incomplete justification.

6. [7M] Consider the following program:

```
#1:  if expr1 then  
#2:    stmt2  
      end if  
  
      do  
#3:    stmt3  
#4:    while expr4  
      end do  
  
#5:    if expr5 then  
#6:      stmt6  
      end if  
  
#7:    stmt7
```

Find out the McCabe's Cyclomatic complexity of the given program. List down various linearly independent paths in this program. Show all the steps, including drawing Control Flow Graph (CFG), for calculation of Cyclomatic complexity and in finding linearly independent paths. Use only the statement numbers shown in the program code while drawing CFG node.

----- End of paper -----