BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI (RAJASTHAN)
First Semester, 2023-2024

35 Marks (35% Weight)	Mid-Semester Test	Open Book

Course Number: SS G552	Course Title: Software Testing Methods
Date : Oct 11, 2023	Time : 11.00 AM - 12.30 PM

Note: There are four questions in all. Please answer all parts of a question in sequence and in continuation.

Q1. Answer the following and provide an example for each.

1.1 Why the faults of commission are less difficult to detect and resolve?

1.2 How does use of GUI for data input and output reduce test cases?

1.3 How number of test cases in path based testing can be reduced?

1.4 What is the advantage if the Input domain is also derived from knowledge of actual use of the program, and not merely from its requirements?

1.5 Why a program also need to be tested against invalid inputs?

Marks Q1 [1 x 5 = 5]

Current State	Output when input is		Next State when input is	
	x	y	x	y
q_1	1	0	q_1	q_4
q_2	0	1	q_1	q_5
q_3	1	0	q_5	q_1
q_4	1	1	q_3	q_4
q_5	1	1	q_4	q_6
q_6	0	1	q_1	q_4

Table Q2

Q2. Answer the following with respect to Table Q2 showing an FSM with q_1 as the initial state:

2.1 Find P-tables.

2.2 Find characterization set

2.3 Find identification set

2.4 Draw the testing tree with q_1 as initial state.

Marks Q2 [2.5 x 4 = 10]

Q3. Solve the following. There will be no partial marking for any part of this question.

3.1 The Boolean expression $(a.(b' + c))'.(b' + (a.c')')'$ where a,b and c are Boolean variables,   is simplified to $X.b$, where X is a Boolean expression. Find X.

3.2 A program contains concatenated (one after other not nested) two three-way decisions, two 4-way case statement and one 7-way case statement. Calculate the cyclomatic complexity of the program.

3.3 A program P finds standard deviation (as float) of the given list of integers in [-10000, 10000]. The integers are given as an array of maximum size 50 and the actual size > 0 of the array is also given as an input. Calculate the number of tests needed for an exhaustive testing, assuming that only valid input is given.

3.4 An application requires two input integer-type variables X, Y, and Z in the range [-100, 100], [50, 100] and [-20, 40] respectively. Generate test cases at and near the bottom-left corner of the boundary.

Marks Q3 [2.5 x 4 = 10]

Q4. For a structured file the requirements are: The character in column 1 must be a '0' or '1' or '2'. The character in column 2 must be a lower-case vowel (i.e. a, e, i, o, u) if character in first column is '0'; must be an upper-case vowel if character in first column is '1'; and a consonant either in lower-case or uppercase if character in first column is '2'. In this situation (i.e. previous two sentences) the update in the file is made. If the character in the first column is incorrect, message "Must be either 0 or 1 or 2" is issued. If the second character does not correspond to as per the character in column 1, appropriate message (e.g. "Must be a lower case vowel" etc.) is flashed.

4.1 List the causes and effects

4.2 Draw the Cause-Effect Graph

4.3 Find (systematically or otherwise) the reduced set of test cases

4.4 If the condition for the first character is implemented as 0 =< FirstCharacterValue =< 2, where FirstCharacterValue is numeric value of the character (i.e. character '1' is numeric 1), then write definitions for three arithmetic errors.

Marks Q4 [2.5 x 4 = 10]