

Testing Concepts

Practice Book

Document Revision History

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Table of Contents

Document Revision History	2
1. BVA & ECP.....	4
Scenario 1 : Stock Control System	4
Scenario 2 : Cloth Store.....	4
Scenario 3 : Discount based upon Age.....	4
Scenario 4 : Year of Birth.....	4
Scenario 5 : Tax Payable	5
Scenario 6 : Numeric field validation	5
Scenario 7 : Persons Age	5
Scenario 8 : Flight Reservation System	5
2. McCabe's Cyclomatic Complexity.....	6
Code Snippet 1 : Single If Statement.....	6
Code Snippet 2 : if..else	6
Code Snippet 3 : Two if statements	6
3. Code Coverage	7
Important Points to Remember	7
Code Snippet 1 : Statement & Branch(Decision) Coverage	7
Code Snippet 2 : Statement & Branch Coverage.....	7
Code Snippet 3 : Statement & Branch Coverage.....	7
Code Snippet 4 : Statement & Decision Coverage	8
Code Snippet 5 : Statement and Branch Coverage	8
Code Snippet 6 : 100% Statement Coverage.....	9
Code Snippet 7 : Statement & Decision Coverage	9
Scenario 8 : % of Statement Coverage	9
Code Snippet 9 : Path Coverage.....	10
4. State Transition Testing	11
Scenario 1 : Series of States in general	11
Scenario 2 : Series of States in Online Shopping.....	11
Scenario 3 : Series of States in Hair-Dryer	11
5. Decision Table Test.....	12
Scenario 1 : Citibank Membership	12
Scenario 2 : Indian Residency.....	12

1. BVA & ECP

Scenario 1 : Stock Control System

Discounts on Flipkart are available in the shopping range between 10000 and 99999 inclusive.

Which of the following inputs might be a result of designing tests for only valid equivalence classes and valid boundaries:

- a) 1000, 5000, 99999
- b) 9999, 50000, 100000
- c) 10000, 50000, 99999
- d) 10000, 99999
- e) 9999, 10000, 50000, 99999, 10000

Scenario 2 : Glass-cutting Store

In a Glass cutting shop, the discount is calculated based on the glass size:

When the size is less than 30" or between 32" and 36" or higher than 42", then he/ she gets a discount.

1. How many equivalence classes are distinguished in the above example?
 - a. 2
 - b. 3
 - c. 4
 - d. 5
2. Which values are chosen for making test cases for calculating the discount when the boundary values analysis is used?
 - A. 29,30,32,33,35,36,42 and 43
 - B. 26,30,34,36,42
 - C. 30,31,32,33,42 and 43
 - D. 27,31,32,41,42 and 47

Scenario 3 : Discount based upon Age

If you are less than 18, you are too young to be insured. Between 18 and 30 inclusive, you will receive a 20% discount. Anyone over 30 is not eligible for a discount.

Which of the following values for age are in the SAME equivalence partition?

- a. 17, 18, 19
- b. 29, 30, 31
- c. 18, 29, 30
- d. 17, 29, 31

Scenario 4 : Year of Birth

An input field takes the year of birth between 2000 and 2004. Find the boundary values for testing this field.

- a. 0,2000,2004,2005
- b. 2000, 2004
- c. 1999,2000,2004,2005
- d. 1999, 2000, 2001, 2002, 2003,2004,2005

Scenario 5 : Tax Payable

In a system designed to work out the tax to be paid, an employee has \$4000 of salary tax free. The next \$1500 is taxed at 10%. The next \$28000 is taxed at 22%. Any further amount is taxed at 40%.

1. To the nearest whole pound, which of these is a valid Boundary Value Analysis test case?

- a) \$1500
- b) \$32001
- c) \$33501
- d) \$28000

2. Which of these groups of numbers would fall into the same equivalence class?

- a) \$4800; \$14000; \$28000
- b) \$5200; \$5500; \$28000
- c) \$28001; \$32000; \$35000
- d) \$5800; \$28000; \$32000

Scenario 6 : Numeric field validation

A program validates a numeric field as follows: values less than 100 are rejected, values between 100 and 201 are accepted, values greater than or equal to 202 are rejected. Which of the following input values cover all of the equivalence partitions ?

- a) 100, 111, 201
- b) 33, 200, 201
- c) 33, 200, 202
- d) 100, 201, 202

Scenario 7 : Persons Age

The person's age in an application accepts the input between 1 to 99. Using BVA which is the appropriate test case set.

- A. 0,1,2,99
- B. 1, 99, 100, 98
- C. 0, 1, 99, 100
- D. -1, 0, 1, 99

Scenario 8 : A Multiplex

In a multiplex, the number of available seats is to be considered. The multiplex has any positive number of available seats, up to the given capacity of the multiplex. Using Boundary Value analysis, a list of available seat values is generated.

Which of the following lists is correct?

- a. 1, 2, capacity - 1, capacity, capacity + 1
- b. 0, 1, capacity, capacity + 1
- c. 0, 1, 2, capacity + 1, a very large number
- d. 0, 1, 10, 100, capacity, capacity + 1

2. MCCABE'S CYCLOMATIC COMPLEXITY

Code Snippet 1 : Single If Statement

Given the Following program, find the McCabe's Cyclomatic Complexity.

```
IF X <>= Z  
THEN Statement 2;  
END
```

- a. 2
- b. 3
- c. 4
- d. 5

Code Snippet 2 : if..else

Given the Following program, find the McCabe's Cyclomatic Complexity.

```
A = 50  
IF B > C THEN  
    A = B  
ELSE  
    A = C  
ENDIF  
Print A  
Print B  
Print C
```

- a. 2
- b. 3
- c. 4
- d. 5

Code Snippet 3 : Two if statements

Given the Following program, find the McCabe's Cyclomatic Complexity.

```
IF A = 50 THEN  
    IF B > C THEN  
        A = B  
    ELSE  
        A = C  
    ENDIF  
END IF  
Print A  
Print B  
Print C
```

- a. 2
- b. 3
- c. 4
- d. 5

3. CODE COVERAGE

Important Points to Remember :

1. Branch coverage and Decision coverage are one and the same
2. 100% Path coverage implies 100% Statement coverage
3. 100% Branch/Decision coverage implies 100% Statement coverage
4. 100% Path coverage implies 100% Branch/Decision coverage

Code Snippet 1 : Statement & Branch(Decision) Coverage

Given the following code, which is true about the minimum number of test cases required for full statement and branch coverage:

```
Read X
Read Y
IF X+Y > 30 THEN
  Print "X+Y Large"
ENDIF
IF X > 15 THEN
  Print "X Large"
ENDIF
```

- a) 1 test for statement coverage, 3 for branch coverage
- b) 1 test for statement coverage, 2 for branch coverage
- c) 1 test for statement coverage, 1 for branch coverage
- d) 2 tests for statement coverage, 3 for branch coverage
- e) 2 tests for statement coverage, 2 for branch coverage

Code Snippet 2 : Statement & Branch Coverage

Given the following code, which is true about the minimum number of test cases required for full statement and branch coverage:

```
Open Meeting Diary
IF meeting scheduled THEN
  Attend meeting
End IF
Close Diary
```

- a) 1 test for statement coverage, 1 for branch coverage
- b) 1 test for statement coverage, 2 for branch coverage
- c) 1 test for statement coverage. 3 for branch coverage
- d) 2 tests for statement coverage, 2 for branch coverage
- e) 2 tests for statement coverage, 3 for branch coverage

Code Snippet 3 : Statement & Branch Coverage

Given the following code, which is true about the minimum number of test cases required for full statement and branch coverage:

```
IF A > B THEN
```

```

C = A - B
ELSE
C = A + B
ENDIF
Read D
IF C = D Then
Print "Error"
ENDIF

```

- a) 1 test for statement coverage, 3 for branch coverage
- b) 2 tests for statement coverage, 2 for branch coverage
- c) 2 tests for statement coverage. 3 for branch coverage
- d) 3 tests for statement coverage, 3 for branch coverage
- e) 3 tests for statement coverage, 2 for branch coverage

Code Snippet 4 : Statement & Decision Coverage

```

Pick up the mobile and see the news highlights on Daily-hunt app
Look at what is on Face-book
If there are any posts that you are interested in watching then
    Continue watching Face-book
Otherwise
    Continue reading news on the Daily-hunt app
If there is any update about IPL matches in the news then
    Go through it.

```

- a) SC = 1 and DC = 1
- b) SC = 1 and DC = 2
- c) SC = 1 and DC = 3
- d) SC = 2 and DC = 2
- e) SC = 2 and DC = 3

Code Snippet 5 : Statement and Branch Coverage

Consider the pseudocode below.

```

1. If x="Monday" then
2. Display_messageX;
3. If y="Sunday" then
4. Display_messageY;
5. Else
6. Display_messageZ;
7. Else
8. Display_messageZ;

```

1. How many tests are required to achieve 100% statement coverage?
 - a. 1
 - b. 2
 - c. 3
 - d. 4
2. How many tests are required to achieve 100% branch/decision coverage
 - a. 1
 - b. 2
 - c. 3
 - d. 4

Code Snippet 6 : 100% Statement Coverage

How many test cases are necessary to cover all the possible sequences of statements (paths) for the following program fragment? Assume that the two conditions are independent of each other.

```
if (x="Automation")
then statement 1
else statement 2
fi
if (x="Manual")
then statement 3
fi
```

- a. 2 Test Cases
- b. 3 Test Cases
- c. 4 Test Cases
- d. Not achievable

Code Snippet 7 : Statement & Decision Coverage

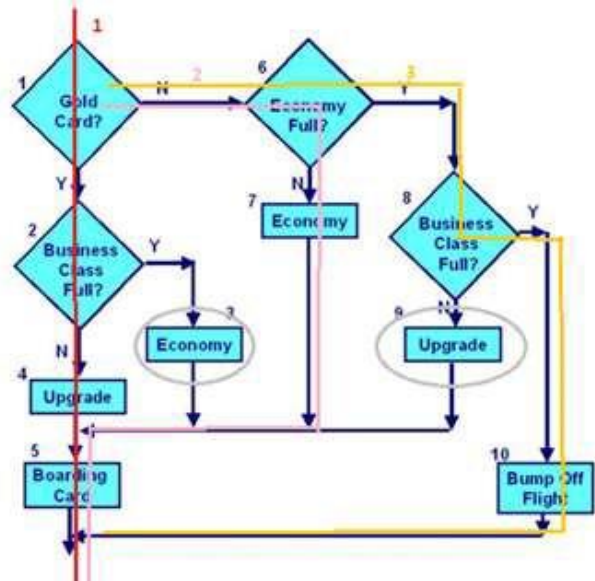
Analyze the following highly simplified procedure. Decide the minimum number of tests that are needed to ensure that all the questions have been asked, all combinations have occurred and all replies given.

```
Ask: "What type of flight ticket do you require, single or return?"
IF the customer wants 'return'
Ask: "Do you prefer Non-stop or one-stop ?"
IF the customer replies 'one-stop'
Say: "That will be Rs.3000"
ELSE
Say: "That will be Rs. 4000"
ENDIF
ELSE
Say: "That will be Rs.2000"
ENDIF
```

- a) 3
- b) 4
- c) 5
- d) 6

Scenario 8 : % of Statement Coverage

If you are flying with an economy ticket, there is a possibility that you may get upgraded to business class, especially if you hold a gold card in the airline's frequent flier program. If you don't hold a gold card, there is a possibility that you will get 'bumped' off the flight if it is full and you check in late. This is shown in below Figure.



Note that each box (i.e. statement) has been numbered. Three tests have been run:

Test 1: Gold card holder who gets upgraded to business class

Test 2: Non-gold card holder who stays in economy

Test 3: A person who is bumped from the flight

What is the statement coverage of these three tests?

- a. 60%
- b. 70%
- c. 80%
- d. 90%

Code Snippet 9 : Path Coverage

Find out the minimum number of paths which will ensure that all the edges are covered (Hint: Follow longest path first).

```

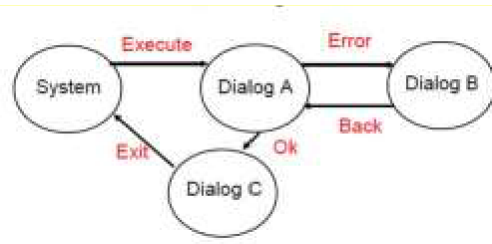
1 READ X
2 READ Y
3 Z = X + 2*Y
4 IF Z > 50 THEN
5 PRINT large Z
6 ENDIF
  
```

- a) 3
- b) 4
- c) 5
- d) 6

4. STATE TRANSITION TESTING

Scenario 1 : Series of States in general

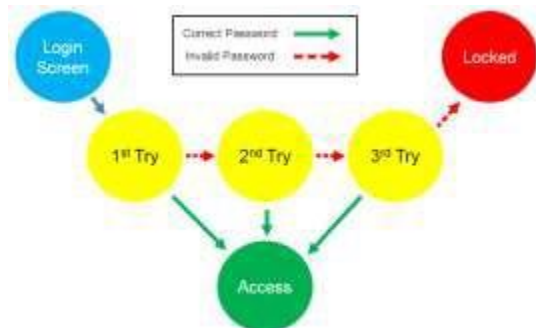
Given the Following state transition diagram, which of the test cases below will cover the following series of transitions? System DialogA DialogC system



- Execute, Ok, Exit
- Execute, Error, Exit
- Execute, Error, Back, Ok, Exit
- Execute, ok, Exit

Scenario 2 : Series of States in Login Module

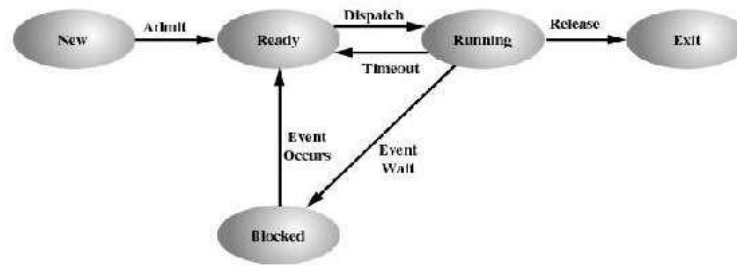
Given the Following state transition diagram, which of the following series of state transitions contain an INVALID transition which may indicate a fault in the system design ?



- Login 1st Try 2nd Try Access.
- Login 2nd Try 3rd Try Locked.
- Login 1st Try Access
- Login 1st Try 2nd Try 3rd Try Access.

Scenario 3 : Series of States in a Five-State Process Model

Given the Following state transition diagram. Identify any three VALID series of transition and any three INVALID series of transition.



5. DECISION TABLE TEST

Scenario 1 : Online Money Transfer

What is the expected result for each of the following test cases.

- A. Account has sufficient money and the OTP also matches
- B. Account has sufficient money but OTP doesn't match

Conditions	Rule 1	Rule 2	Rule 3	Rule 4	Rule 5
Account Exists ?	T	T	T	T	F
OTP Matches ?	T	T	F	F	F
Sufficient Money in the Account?	T	F	T	F	F
Actions					
Transfer Money	yes	no	no	no	no
Show Message"Insufficient Funds"	no	yes	no	no	no
Block Transaction incase of suspicious transaction	no	no	yes	yes	yes

Scenario 2 : Insurance Class

What is the expected result for each of the following test cases.

TC1: Anand is 21 yrs old with insurance class B

TC3: John is 65 year old with insurance class C.

	Rule 1	Rule 2	Rule 3	Rule 4
Conditions				
Age	<21 yrs	21-29 yrs	30-50yrs	> 50yrs
Insurance Class	A	A or B	B, C or D	C or D
Actions				
Premium	£100	£90	£70	£70
Excess	£2,500	£2,500	£500	£1000