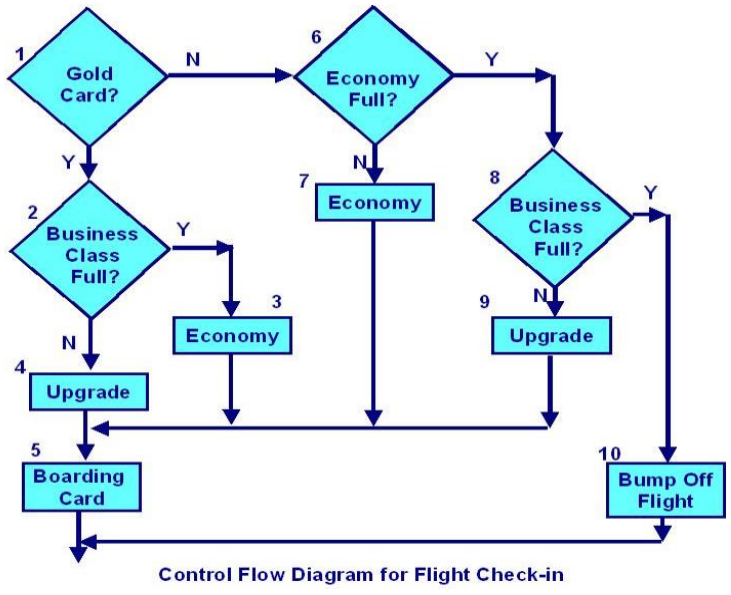
Name : Anand Kuralkar

Roll no : 06 (Technocrats)

STQA Tutorial: Problem Solving Based on Test Design Techniques

1. 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 following 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% (3M)



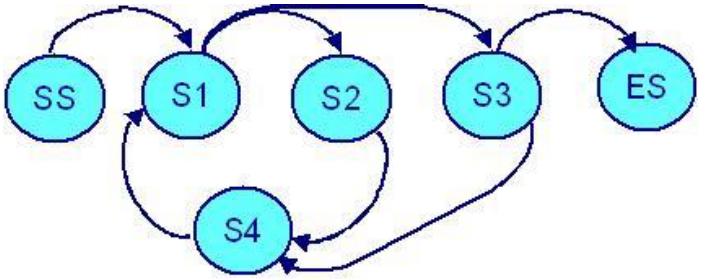
Control Flow Diagram for Flight Check-in

Solution:
Test 1: Gold card holder who gets upgraded to business class = 4 statements executed out of 10 statements-1,2,4,5
Test 2: Non-gold card holder who stays in economy= 4 statements executed out of 10 statements -1,6,7,5
Test 3: A person who is bumped from the flight-4 statements executed out of 10 statements-1,6,8,10

Altogether statements 1,2,4,5,6,7,8,10 are executed out of a total of 10 statements. So, ST =8/10=80%

Answer: C

2. **Given the state diagram in following Figure, which test case is the minimum series of valid transitions to cover every state? (1M)**



State Diagram

A. SS – S1 – S2 – S4 – S1 – S3 – ES
B. SS – S1 – S2 – S3 – S4 – S3 – S4 – ES
C. SS – S1 – S2 – S4 – S1 – S3 – S4 – S1 – S3 – ES
D. SS – S1 – S4 – S2 – S1 – S3 - ES

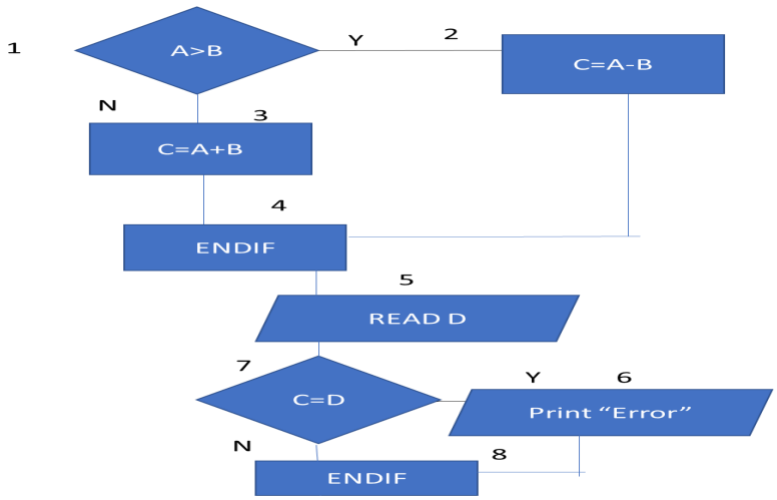
Solution:
The minimum series of valid transitions to cover every state is
SS – S1 – S2 – S4 – S1 – S3 – ES
Answer: A

3. Given the following code, which is true: (2M)

```
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

Solution:



Test Case 1: A= 8, B= 4, C= 4, D= 4, true branch outcome of both first and second condition is satisfied

Test Case 2: A= 1, B= 3, C= 4, D= 5, false branch outcome of both first and second condition is satisfied

Therefore minimum 2 test cases will be required to achieve 100% statement and branch coverage

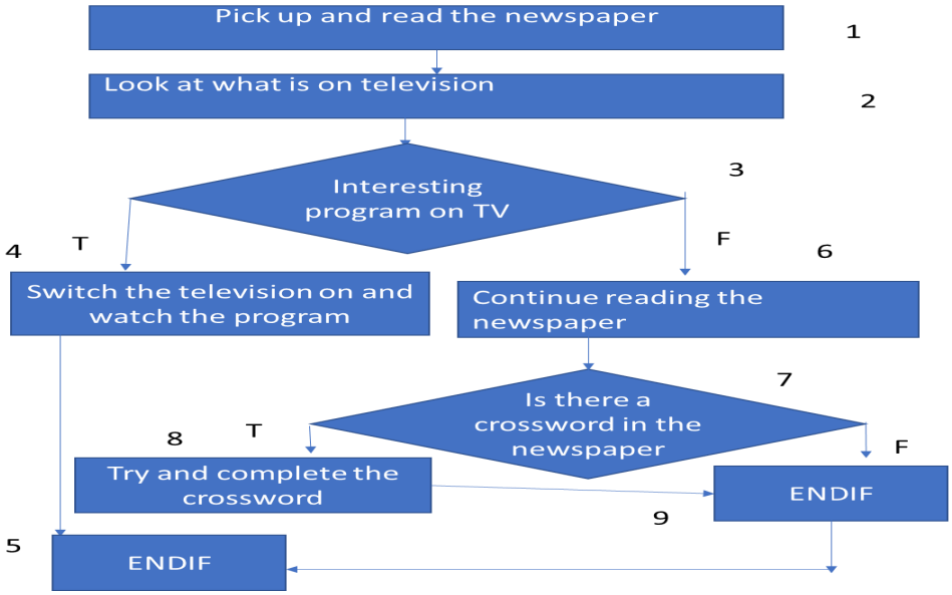
Answer: B

4. Consider the following: How many minimum test cases will be required for 100% Statement and decision coverage

Pick up and read the newspaper
Look at what is on television
If there is a program that you are interested in watching, then switch the television on and watch the program
Otherwise
Continue reading the newspaper
If there is a crossword in the newspaper then try and complete the crossword
(2M)

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

Solution:



Answer: E

5. If the pseudocode below were a programming language, how many tests are required to achieve 100% statement coverage? (1M)

```
If x=3 then
Display_messageX;
If y=2 then
Display_messageY;
Else
Display_messageZ;
Else
Display_messageZ;
```

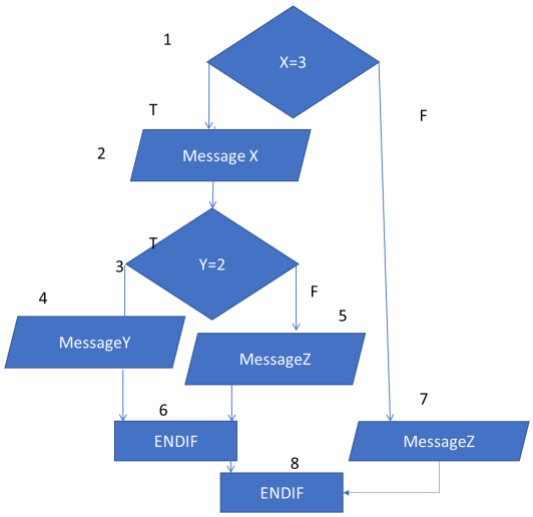
A. 1

B. 2

C. 3

D. 4

Solution:



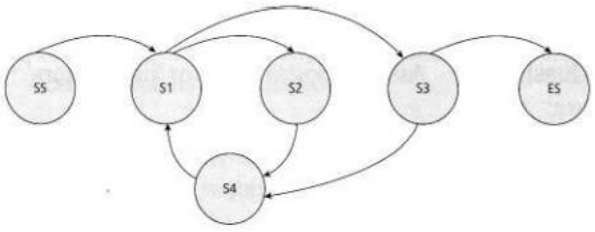
Test Case 1: X=3, Y=2

Test Case 2: X=2, Y=2

Test Case 3: X=3, Y=4

Answer: C

6. Consider the following state transition diagram (1M)



Given this diagram, which test case below covers every valid transition?

A. SS-S1-S2-S4-S1-S3-ES
B. SS-S1-S2-S3-S4-S3-S4-ES
C. SS-S1-S2-S4-S1-S3-S4-S1-S3-ES
D. SS-S1-S4-S2-S1-S3-ES

Solution:

SS-S1-S2-S4-S1-S3-S4-S1-S3-ES covers every valid transition

Answer: C