Software Engineering

Assignment-11

TYPE OF QUESTION: MCQ/MSQ

Number of questions: **10** **Total mark: 10 X 1 = 10**

For each of the following questions one or more of the given options are correct. Choose the correct options.

QUESTION 1:

At least how many test cases are required to achieve condition/decision coverage of the following code segment:

```
If((a>5) and (b<100) and (c>50))  x=x+1;
```

a. 1
b. 2
c. 3
d. 4
e. 8

Correct Answer: b. 2

Detailed Solution:

The two test cases (a = 6, b = 99, c = 51) and (a = 4, b = 101, c = 49) are enough to achieve condition/decision coverage.

QUESTION 2:

At least how many test cases are required to achieve multiple condition coverage of the following code segment:

```
If((a>5) and (b<100) and (c>50))  x=x+1;
```

a. 2
b. 4
c. 6
d. 8
e. 16

Correct Answer: d. 8

Detailed Solution:

The number of test cases required can be easily found by the formula 2 ^ n. Here n = 3, so the number of test cases required is 8.

QUESTION 3:

Cause-effect test cases are, in effect, designed using which one of the following types of testing techniques?

a. Decision-table based testing
b. Coverage-based testing
c. Fault-based testing
d. Path-based testing
e. Boundary value testing

Correct Answer: a. Decision-table based testing

Detailed Solution:

Cause-effect test cases are designed from Decision-table based testing. Please refer slide no. 18 for better understanding.

QUESTION 4:

If a user interface has three checkboxes, at least how many test cases are required to achieve pair-wise coverage?

a. 2
b. 3
c. 4
d. 5
e. 6

Correct Answer: c. 4

Detailed Solution:

If we use the following test cases:
(000), (010), (101), (111), all pairs of check boxes can be covered.

QUESTION 5:

At least how many test cases are required to achieve basic condition coverage of the following code segment:

```
If((a>5) and (b<100) and (c>50))  x=x+1;
```

a. 1
b. 2
c. 3
d. 4

Correct Answer: b. 2

Detailed Solution:

In basic condition coverage, each atomic condition assume T and F values. So two test cases is enough to check that. For example, a=6, b=99, and c=51 will make all conditions true and a=4, b=101, and c=49 will make all conditions false.

QUESTION 6:

For the following program statement, which of the following test suites would achieve basic condition/decision coverage?

```
if (a>10 && b<50)  p++;
```

a. (a=20,b=10), (a=0,b=15)
b. (a=100,b= -100), (a=-100,b=100)
c. (a=20,b=10), (a=0,b=15), (a=5,b=45)
d. (a=50,b=70), (a=0,b=35), (a=50,b=35)
e. (a=50,b=20), (a=1,b=85)

Correct Answer: b. (a=100,b=-100), (a=-100,b=100), **d.** (a=50,b=70), (a=0,b=35),(a=50,b=35) **e**. (a=50,b=20), (a=1,b=85)

Detailed Solution:

In condition/decision coverage: Each atomic condition made to assume both T and F values, Decisions are also made to get T an F values. In the given question, option b., d., and e. giving correct value.

QUESTION 7:

Consider the following "C" code segment. At least how many test cases are needed for the given C code for achieving decision coverage?

```
int main (){
        int a,b=0;
        scanf("%d",&a);
        if( a < 10 || a>100)  {
                                b=b+10;}
        if( a == 20 ){
                                b=b+20;}
        if( a == 30 ){
                                b=b+30;}
        else{
                               b=b+40; }
}
```

a. 2
b. 3
c. 6
d. 8
e. 10

Correct Answer: b. 3

Detailed Solution:

In decision coverage, the whole decision is executed as True and False at least once. With 3 test cases, we can achieve 100% decision coverage: a=20, a=30, a=5.

QUESTION 8:

At least how many test cases are needed for the C code segment given question 7, for achieving basic condition coverage?

a. 2
b. 3
c. 4
d. 6
e. Basic condition coverage is not achievable

Correct Answer: c. 4

Detailed Solution:

From the given program, it can be observed that there are three decision. For first decision, two condition required to check: one test case for a<10 and another test case for a>100. For, second decision, one condition a==20 required to check so one test case. Similarly, for third decision, one condition a==30 required to check so one test case. So, total four test cases required for achieving basic condition coverage.

The test cases are:- TC1: a=20, TC2: a=30, TC3: a=5, TC4: a=105

QUESTION 9:

At least how many test cases are needed for the C code segment given question 7, for achieving multiple condition coverage?

a. 4
b. 5
c. 6
d. 8
e. Multiple condition coverage is not achievable for the given code

Correct Answer: e. Multiple condition coverage is not achievable for the given code

Detailed Solution:

For the first decision of the given code, we can see that it consist of two condition: one is a<10 and another one is a>100. It is not possible to make both the condition true for a single test case. For example, if we take a=5 then a<10 become true but a>100 is not true. Similarly, if we take a=110 then a>100 become true but a<10 become false. So, for a same test case we cannot achieve 'TT' for both the condition. So, that is the reason for not achievable multiple condition coverage for the given code.

QUESTION 10:

Which one of the following pairs of white-box test techniques are complementary test techniques?

a. Statement-coverage and path coverage
b. Statement-coverage and branch coverage
c. Multiple condition coverage and MC/DC testing
d. Multiple condition coverage and decision coverage
e. Path coverage and MC/DC testing

Correct Answer: e. Path coverage and MC/DC testing

Detailed Solution:

Path coverage and MC/DC testing are the complementary test techniques.

**********END**********