Software Engineering

Assignment-10

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:

Why is it necessary to test a large program at three different levels: unit, integration, as well as system levels, rather than testing only at the system level?

a. It reduces the number of test cases that need to be designed
b. It reduces the test execution effort
c. It reduces the debugging effort
d. It reduces test case design effort.
e. It increases thoroughness of testing

Correct Answer: c. It reduces the debugging effort

Detailed Solution:

If we thoroughly test in the system level only, it may possible some faults of unit or integration level remain undetected. So, debugging those undetected bugs become hurdle. But, if we test in different level, debugging effort reduces.

QUESTION 2:

Consider a function that takes an integer **a** (which can assume integral values between 0 to 100) as its argument and carries out actions involving setting the value of a variable **b**, and the value of the variable is displayed, as specified in the following table.

Condition	Action
(a<10)||(a>80)	b=b+10
(a== 30)	b=b+20;
(a==40)	b=b+30;

During black box testing of the function, at least how many valid equivalence case test cases are required?

a. 3
b. 4
c. 5
d. 6
e. 7

Correct Answer: b. 4

Detailed Solution:

valid equivalence test cases: a<10 any value, a>80 any value, a=30, and a=40. So 4 valid test cases.

QUESTION 3:

Consider the following function that takes an integer a (that can assume values between 0 to 100) as argument and carries out the following actions involving setting the value of a variable b.

Condition	Action
(a<10)||(a>80)	b=b+10

During black box testing of the function, at least how many boundary value test cases are required assuming that robust testing is not targeted?

a. 5
b. 12
c. 13
d. 17
e. 18

Correct Answer: a. 5

Detailed Solution:

Boundary value test cases = 4z+1=5.

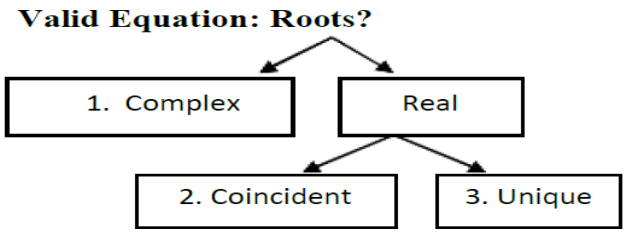
QUESTION 4:

Consider a function named **solver** that solves a quadratic equation of the form $ax^2+bx+c=0$, where a, b, and c are floating point numbers. At least how many test cases are needed for strong equivalence class testing of the function **solver** considering only valid equivalence classes?

a. 3
b. 4
c. 5
d. 6
e. 7

Correct Answer: a. 3

Detailed Solution:



QUESTION 5:

Consider a function named **compute-grade** that computes the grade of a student based on his attendance and the total marks obtained out of 100. If the attendance is below 80%, the student is assigned "F" grade irrespective of the marks scored. If the attendance of a student is 80% or more, the student with mark M is assigned a grade from EX, A, B, C, D, P, F depending upon whether M>89%, 90%>M>79%, 80%>M>69%, 70%>M>59%, 60%>M>49%, 50%>M>29%, or M<30%. If the decision making about the grade computation is represented in the form of a decision table, at least how many test cases are needed for decision table testing?

a. 6
b. 7
c. 8
d. 9
e. 10

Correct Answer: c. 8

Detailed Solution:

Conditions								
C1: attendance< 80%	T	F	F	F	F	F	F	F
C2: M>89%	-	T	F	F	F	F	F	F
C3: 90%>M>79%	-	-	T	F	F	F	F	F
C4: 80%>M>69%	-	-	-	T	F	F	F	F
C5: 70%>M>59%	-	-	-	-	T	F	F	F
C6: 60%>M>49%	-	-	-	-	-	T	F	F
C7: 50%>M>29%	-	-	-	-	-	-	T	F
C8: M<30%	-	-	-	-	-	-	-	T
Actions								
A1: Grade=F	x							
A2: Grade=A		x						
A3: Grade=B			x					
A4: Grade=C				x				
A5: Grade=D					x			
A6: Grade=E						x		
A7: Grade=P							x	
A8: Grade=F								x

QUESTION 6:

Scenario coverage testing can be considered to be which one of the following types of testing strategies?

a. Pair-wise testing
b. Decision table-based testing
c. Equivalence partitioning-based testing
d. Boundary value-based testing
e. Combinatorial testing

Correct Answer: c. Equivalence partitioning-based testing

Detailed Solution:

Equivalence partitioning-based testing also called scenario coverage testing.

QUESTION 7:

Consider a function **compute-grade** has been written by the academic unit of an Institute to compute the grade of a student from the marks obtained. Assume that the following grading scheme is being used by the academic Institute.

Marks	Grade
>=0 and <30	F
>= 30 and <50	P
>=50 and <60	D
>=60 and <70	C
>=70 and <80	B
>=80 and <90	A
>=90 and <=100	Ex

During black box testing of the function **compute-grade**, altogether at least how many equivalence test cases are needed to be designed, assuming that robust testing is targeted?

a. 6
b. 7
c. 8
d. 9
e. 10

Correct Answer: d. 9

Detailed Solution:

For equivalence robust testing valid and invalid both classes are considered. In this question, we can observed from the given table, 7 are valid classes and two invalid classes: Marks<0 and Marks>100. So, total test cases = 9.

QUESTION 8:

Suppose an untested program was determined to contain 640 bugs. Three different testing techniques were applied to test the code. Each testing technique is effective to detect 50% of the bugs that exist before the concerned testing technique is applied. While fixing a bug after the application of a test strategy, there is a 50% chance of creating another bug. How many bugs would exist in the code after the three testing and bug-fix cycles have been carried out?

a. 200
b. 270
c. 350
d. 448
e. 487

Correct Answer: b. 270

Detailed Solution:

Test 1: Total bugs = 640, 50% of 640 = 320, 50 % of 320 = 160, remaining bugs = 640-320+160=480. Test 2: Total bugs = 480, 50% of 480 = 240, 50 % of 240 = 120, remaining bugs = 480-240+120=360. Test 3: Total bugs = 360, 50% of 360 = 180, 50% of 180 = 90, Remaining final bugs= 360-180+90=270

QUESTION 9:

Which one of the following types of bugs may not get detected in black-box testing, but are very likely to be get detected by white-box testing?

a) Incorrect functionality
b) Missing functionality
c) Trojans
d) Incorrect algorithm
e) Performance errors

Correct Answer: c. Trojans

Detailed Solution:

Incorrect or missing functionality can be detected by black-box testing. Also, incorrect algorithm, performance issues may get detected by black-box testing. But, trojan is a programming bug which can be detected by white-box testing.

QUESTION 10:

Suppose a function named **try** takes two Boolean variables as input. How many valid equivalence classes can be designed for the black-box testing of the function **try**?

a. 2
b. 4
c. 6
d. 8
e. 10

Correct Answer: b. 4

Detailed Solution:

Two Boolean variables so each of them has two values. So, valid equivalence classes $=2\times2=4$.
