Week 0 : Assignment 0

State true or false: If testing is done well, all errors in software can be found.

 True

 False

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*False*

***1 point***

State true or false: In the waterfall model for software development, there is always a separate testing phase after coding but, in agile  
    software development testing is completed in the same iteration as programming.

 True

 False

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*True*

***1 point***

Which of the following best corresponds white box testing?

 Testing done using building blocks of code, based on its structure.

 Testing done to check if code satisfies requirements.

 Testing done by customers after release.

 Testing done by developers for de-bugging.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Testing done using building blocks of code, based on its structure.*

***1 point***

What is regression testing?

 Testing done on the entire code each time a part of it is modified.

 Testing done on the entire code after release, for each modification.

 Testing done each time code is modified to ensure that the newly added code works as expected along with the existing code.

 Testing done by customer on the newly added features in the code.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Testing done each time code is modified to ensure that the newly added code works as expected along with the existing code.*

***1 point***

State true or false: Testing can be done fully by tools.

 True

 False

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*False*

***1 point***

What kinds of graphs are used in testing?

 Graphs with nodes representing blocks of code and edges representing execution of code.

 State diagrams in UML.

 Graphs representing procedures or functions and they calling or returning other procedures or functions.

 All of the above.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*All of the above.*

***1 point***

Relational and logical expressions are used to test which elements of code below?

 They are used to test decision statements like **if-then-else, switch-case, while, for** etc.

 They are used to check if requirements are met.

 They are used to check if loops terminate.

 They are used to check if the logic behind code is correct.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*They are used to test decision statements like****if-then-else, switch-case, while, for****etc.*

***1 point***

Suppose a web application is tested by increasing the number of users to more than the maximum number possible, what kind of testing does this represent?

 Performance testing.

 Stress testing.

 System testing.

 Acceptance testing.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Stress testing.*

***1 point***

State true or false: Testing techniques used for system level testing of gaming applications can also be used for system level testing of web applications.

 True

 False

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*False*

***1 point***

State true or false: In test driven development, test cases are written first and then code is written to meet the test cases.

 True

 False

Yes, the answer is correct .  
Score: 1

Accepted Answers:

*True*

Week 1 : Assignment 1

***1 point***

An error was detected in a piece of code in the version that was ready for release, just before the release. The error was successfully fixed by the concerned software developer who did not test if the entire software is working correctly with the fix. Which kind of testing did the developer fail to do?

 System testing.

 Integration testing.

 Regression testing.

 Functional testing.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Regression testing.*

***1 point***

When is it that we say that a particular coverage criterion C1C1 **does not** subsume another coverage criterion C2C2?



C1C1 does not subsume C2C2 when there is at least one test case that satisfies C1C1 that does not satisfy C2C2.



C1C1 does not subsume C2C2 when there is at least one test case that satisfies C2C2 that does not satisfy C1C1

No, the answer is incorrect.  
Score: 0

Accepted Answers:

C1C1*does not subsume*C2C2*when there is at least one test case that satisfies*C2C2*that does not satisfy*C1C1

***1 point***

Consider the statements regarding testing given below.

* Testing can be used to find **all** the errors in code.
* Testing can be used to show that a piece of software is fully correct.
* Testing can be used to find real errors in code.
* The purpose of testing is not to show correctness of software but to
* show errors.

Which of the following is true about the above-given statements?

 All the statements above are correct.

 The first and second statements are correct.

 The third and fourth statements are correct.

 Only the fourth statement is correct.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*The third and fourth statements are correct.*

***1 point***

With reference to the various levels of testing, which level is the most mature and ideal for reducing errors in software and which level is the least mature and possibly leads to unknown faults being found after de- ployment?

 Level 4 is the most mature and level 0 is the least mature level.

 All the levels are at equal risk, there is no notion of one level being more mature than the other.

 Level 0 is the most mature and level 4 is the least mature level.

 Level 4 is the most mature and level 1 is the least mature level, level 0 is of not much use for consideration.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Level 4 is the most mature and level 0 is the least mature level.*

***1 point***

A particular software requirement specifies that a piece of software running on a cloud server needs to respond really fast even when thousands of users login simultaneously and request for services. Which kind of testing is done to check for such a requirement?

 System testing.

 Stress testing.

 Performance testing.

 Functionality testing.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*Stress testing.*

***1 point***

Which of the following is a list of testing phases where both white-box and black-box techniques are applicable?

 Unit testing only.

 Unit testing and integration testing only.

 Unit testing, integration testing and system testing.

 None of the above.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Unit testing, integration testing and system testing.*

***1 point***

State true or false: There are certain phases in the software development and testing life-cycle where predominantly only black-box testing tech- niques are used.

 True.

 False.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*True.*

***1 point***

What are the results of test case execution?

 There is an explicit message that test case execution has caused an error in the program.

 There is an explicit message that there is no error from the test case.

 The test case has either passed or failed.

 The program produces an output that is the same as the expected output.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*The test case has either passed or failed.*

***1 point***

State true or false: Can JUnit be used to pass a collection of test cases for execution and collating the results?

 True.

 False.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*True.*

***1 point***

What does the JUnit assertion assertFalse(x1 <= x2) return when x1 is greater than x2?

 True.

 False.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*True.*

Week 1: Assignment 1 (Non graded)

***1 point***

Which of the following best defines a test case as per the lectures?

 A test case contains inputs to software.

 A test case contains inputs and expected outputs to software.

 A test case contains inputs to software, which is run and the actual output is also recorded as a part of the test case.

 A test case contains inputs and a decision on pass or fail.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*A test case contains inputs and expected outputs to software.*

***1 point***

Which of the following represents usability testing?

 Testing done by an user of the software.

 Testing done to see if the software is usable in the sense that it meets its functionality.

 Testing done to evaluate the software’s user interface and its design.

 Testing done to see if the software is fast enough to be usable.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Testing done to evaluate the software’s user interface and its design.*

***1 point***

When do we say that a set of test cases *T* satisfies test requirements *TR* for a coverage criterion *C*.

 For every test requirement *tr ∈ TR,* there is exactly one test case *t ∈ T* such that *t* satisfies *tr*.

 For some test requirement *tr ∈ TR,* there is some test case *t* such that *t ∈ T* such that *t* satisfies *tr*.

 For some test requirement*tr ∈ TR,* all the test cases *t ∈ T* are such that *t* satisfies *tr*.

 For every test requirement *tr ∈ TR,* there is at least one test case *t ∈ T* such that *t* satisfies *tr*.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*For every test requirement tr ∈ TR, there is at least one test case t ∈ T such that t satisfies tr.*

***1 point***

What does the JUnit assertion assertFalse(val1 > val2) return when val1 is greater than val2?

 True.

 False.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*False.*

***1 point***

In which of the levels of testing, do testers use testing to show errors in software?

 Level 3.

 Level 4.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Level 3.*

Week 2 : Assignment 2

***1 point***

When do we say that a test path pp tours a sub-path qq with a side-trip?



A test path pp tours a sub-path qq with a side-trip when pp is an infeasible test path on its own.



A test path pp tours a sub-path qq with a side-trip when every vertex and every edge in q also occurs in pp in the same order.



A test path pp tours a sub-path qq with a side-trip when every vertex in qq also occurs in pp in the same order.



A test path pp tours a sub-path qq with a side-trip when every edge in qq also occurs in pp in the same order.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*A test path*pp*tours a sub-path*qq*with a side-trip when every edge in*qq*also occurs in*pp*in the same order.*

***1 point***

Which of the graph traversal algorithms given below, when run on a graph that does not have edge weights, will return the shortest path between a pair of vertices?

 Depth first search (DFS)

 Breadth first search (BFS)

 Both DFS and BFS

 Neither BFS nor DFS

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Breadth first search (BFS)*

***1 point***

Why is complete path coverage considered to be an infeasible structural graph coverage criterion?

 Complete path coverage could be infeasible if the graph has several disconnected components.

 Complete path coverage could be infeasible if the graph has strongly connected components or loops.

 Complete path coverage could be infeasible if the graph has isolated vertices or edges.

 Complete path coverage could be infeasible as covering all paths in a graph through test cases is not needed.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Complete path coverage could be infeasible if the graph has strongly connected components or loops.*

***1 point***

Which graph coverage criterion considers writing test cases where all the simple paths of maximal length are visited?

 Complete path coverage.

 Simple path coverage.

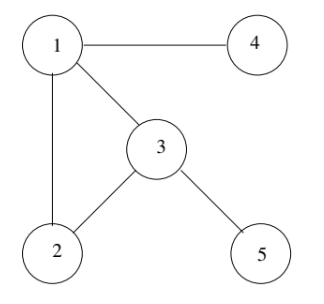
 Specified path coverage.

 Prime path coverage.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Prime path coverage.*

The following six questions are about breadth first search and depth first search algorithms on a given graph. Consider an undirected graph G=(V,E)G=(V,E) given below, where the set of vertices V={1, 2, 3, 4, 5}V={1, 2, 3, 4, 5} and the set of edges E={(1, 2),(1, 3),(1, 4),(3, 2),(3, 5)}E={(1, 2),(1, 3),(1, 4),(3, 2),(3, 5)}. We run BFS and DFS algorithms on this graph starting from the vertex 1 which is the initial vertex. Answer the following questions.  
 

***1 point***

Which are the three vertices that will be added to the BFS queue in the first step of the BFS algorithm? Does the order in which they are added matter?

 The three vertices will be 2, 3 and 4, their order will be exactly the same as the one given in this answer option.

 The three vertices will be 2, 3 and 4, their order does not matter.

 The three vertices will be 2, 3 and 5, their order will be exactly the same as the one given in this answer option.

 The three vertices will be 2, 3 and 5, their order does not matter.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*The three vertices will be 2, 3 and 4, their order does not matter.*

***1 point***

If vertices 2, 3 and 4 are added in the queue in the given order during the BFS visit, which vertex will be marked as visited first?

 Vertex 2 will be marked as visited first.

 Vertex 3 will be marked as visited first.

 Vertex 4 will be marked as visited first.

 None of the three given vertices will be marked as visited first.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Vertex 2 will be marked as visited first.*

***1 point***

When will BFS traversal be complete for the given graph?

 BFS traversal will be complete when all the vertices are marked as visited and the queue is empty.

 BFS traversal will be complete when all the vertices are added to the queue.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*BFS traversal will be complete when all the vertices are marked as visited and the queue is empty.*

***1 point***

Which of the following represents a correct order of visit during a breadth first search traversal of the given graph starting from vertex 1?

 1, 2, 3, 4, 5.

 1, 4, 5, 2, 3.

 1, 5, 4, 3, 5.

 1, 4, 5, 2, 3.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*1, 2, 3, 4, 5.*

***1 point***

Which of the following represents a correct order of visit during a depth first search traversal of the given graph starting from vertex 1?

 1, 4, 5, 2, 3.

 1, 2, 3, 4, 5.

 1, 2, 3, 5, 4.

 1, 5, 4, 3, 2.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*1, 2, 3, 5, 4.*

***1 point***

Which of the following options are true regarding DFS and BFS traversals in the given graph starting with vertex 1?

 Both DFS and BFS will always visit the vertices in the same order.

 DFS order of traversal need not be the same as the BFS order of traversal for the give graph.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*DFS order of traversal need not be the same as the BFS order of traversal for the give graph.*

Week 2: Assignment 2 (Non graded)

**Your last recorded submission was on 2024-10-24, 09:48 IST**

**Note : This assignment is only for practice purpose and it will not be counted towards the Final score**

***1 point***

When do we say that a test path *p* tours a path *q*

 We say that a test path *p* tours a path *q* if *q* is a sub-path of *p*.

 We say that a test path *p* tours a path *q* if *p* is a sub-path of *q*.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*We say that a test path p tours a path q if q is a sub-path of p.*

***1 point***

How many requirements are there for edge pair coverage?

 10 requirements.

 12 requirements.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*12 requirements.*

***1 point***

Which of the following test paths satisfy node coverage but not edge coverage on the graph?

 Test path [1, 2, 4, 6, 1, 7].

 Test path [1, 2, 4, 5, 6, 1, 7].

 Test path [1, 2, 3, 2, 4, 6, 1, 7].

 Test path [1, 2, 3, 2, 4, 5, 6, 1, 7].

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Test path [1, 2, 3, 2, 4, 5, 6, 1, 7].*

***1 point***

What do the prime paths [2, 3, 2] and [3, 2, 3] together represent?

 They represent two ways of going around the loop between the vertices 2 and 3.

 They represent more than one iteration of the loop between the vertices 2 and 3.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*They represent more than one iteration of the loop between the vertices 2 and 3.*

***1 point***

Consider the simple path [3, 2, 4, 5, 6] and test path [1, 2, 3, 2, 4, 6, 1, 2, 4, 5, 6, 1, 7]. Does the test path tour the simple path directly or with a sidetrip?

 The test path tours the simple path directly.

 The test path tours the simple path with a side trip [4, 6, 1, 2, 4].

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*The test path tours the simple path with a side trip [4, 6, 1, 2, 4].*

Week 3 : Assignment 3

***1 point***

State true or false: The control flow graph fragments for loops like while, for etc., can vary slightly and this is acceptable as long as the control flow is captured correctly.

 True.

 False.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*True.*

***1 point***

A node or a set of nodes that in a particular control flow graph that cannot be reached through DFS or BFS represents which kind of statements in the corresponding program source code?

 These node(s) represent statements that are incorrect.

 These node(s) represent statements that are not reachable by any input.

 These node(s) represent statements that are reachable only by inputs that are wrong or out of range.

 These node(s) represent statements that will not contribute to generating outputs when the program is executed.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*These node(s) represent statements that are not reachable by any input.*

***1 point***

Given a piece of source code, what is the information about the data that is captured in a data flow graph corresponding the code?

 A data flow graph tracks information about how a value of a variable changes.

 A data flow graph captures information about how a variable gets defined, in the sense, the kind of statement that defines a variable.

 A data flow graph captures information about the statements that define a value for a variable and statements that use the defined value of a variable.

 A data flow graph tracks the change of data from the statements where the variables are defined to the statements where the variables are used.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*A data flow graph captures information about the statements that define a value for a variable and statements that use the defined value of a variable.*

***1 point***

Which of the following represents a correct order of subsumption exclusively amongst data flow coverage criteria? In the options below, read →→ as ‘subsumes’.



All-defs coverage →→ All-du-paths coverage →→ All-uses coverage.



All-defs coverage →→ All-uses-coverage →→ All-du-paths coverage.



All-du-paths coverage →→ All-defs coverage →→ All-uses-coverage.



All-du-paths coverage →→ All-uses coverage →→ All-defs-coverage.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*All-du-paths coverage*→→*All-uses coverage*→→*All-defs-coverage.*

***1 point***

Considering the coverage criteria on both control flow graphs and data flow graphs, which of the following represents a correct order of subsumption amongst the mentioned criteria? Again, read →→ as ‘subsumes’.



Prime paths coverage →→ All-du-paths coverage.



All-du-paths coverage →→ Prime paths coverage.

 Since one kind of criteria are on control flow only and the other on data flow only, the two cannot be compared.

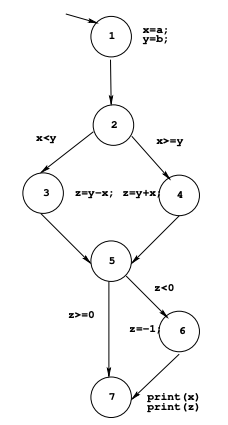
 None of the control flow coverage criteria subsumes any of the data flow coverage criteria.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*Prime paths coverage*→→*All-du-paths coverage.*

***1 point***

List all the nodes where the variable z is defined  


 Node 6 only.

 Nodes 3, 4 and 6 only.

 Nodes 3, 4, 5 and 6 only.

 Nodes 2, 3, 4, 5 and 6 only

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Nodes 3, 4 and 6 only.*

***1 point***

Which of the statements below are correct regarding the definitions and uses of the variables x and y?

 The nodes that define the variables x and y are the same.

 The nodes that define and use the variables x and y are the same.

 The nodes and edges that define the variables x and y are the same.

 The nodes and edges that define and use the variables x and y are the same.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*The nodes that define the variables x and y are the same.*

***1 point***

State yes or no: The use of the variables at the edges (2, 3) and (2, 4) are the same as the use of the variables at the nodes 3 and 4.

 Yes.

 No.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*No.*

***1 point***

How many du-pairs are there for the variable z?

 Eight du-pairs.

 Nine du-pairs.

 Ten du-pairs.

 Eleven du-pairs.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Nine du-pairs.*

***1 point***

How many unique du-paths are there for the variable z?

 Four paths.

 Five paths.

 Six paths.

 Seven paths.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Five paths.*

Week 3 : Assignment 3 (Non graded)

***1 point***

Which of the following best defines a linearly independent path of execution in the CFG of a program?

 A linearly independent path in the CFG is a path that does not contain other paths within it.

 A linearly independent path is a simple path in the CFG.

 A linearly independent path is a path from one decision to another in a CFG.

 A linearly independent path is a prime path in the CFG.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*A linearly independent path in the CFG is a path that does not contain other paths within it.*

***1 point***

State true or false: All uses coverage criterion subsumes edge coverage criterion.

 True

 False

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*True*

***1 point***

Which of the following is a list of nodes having uses for variable ww?



Nodes 2, 3, and 7 have uses for ww.



Nodes 2 and 3 have uses for ww.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Nodes 2, 3, and 7 have uses for*ww*.*

***1 point***

State yes or no: Are there any du-paths with respect to variable ww from node 1 to node 7?

 Yes

 No

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*No*

***1 point***

Which of the following is a list of du-paths for the variable ww?

 Paths [2, 4, 5, 7], [2, 4, 6, 7], [3, 4, 5, 7] and [3, 4, 6, 7].

 Paths [1, 2], [1, 3], [2, 4, 5, 7], [2, 4, 6, 7], [3, 4, 5, 7] and [3, 4, 6, 7].

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Paths [1, 2], [1, 3], [2, 4, 5, 7], [2, 4, 6, 7], [3, 4, 5, 7] and [3, 4, 6, 7].*

Week 4 : Assignment 4

***1 point***

If a particular method *A* in a class sends a message using an exclusive buffer to a method *B* in another class, which type of interface does this constitute?

 Class interface.

 Buffer interface.

 Message passing interface.

 Shared interface.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*Message passing interface.*

***1 point***

In a call graph that represents all the function or method calls, what does edge coverage achieve?

 Edge coverage tests for executing every call at least once.

 Edge coverage tests for executing all the paths that contain calls at least once.

 Edge coverage tests for sending data on call interfaces.

 Edge coverage tests for calling every function or method in any order.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*Edge coverage tests for executing every call at least once.*

***1 point***

Which of the following best defines a coupling du-path?

 A coupling du-path is from a coupled definition of a variable to the corresponding use.

 A coupling du-path is from the last definition of a variable to the first use of the same variable.

 A coupling du-path is from a definition of a variable to its use such that there is no definition in between.

 A coupling du-path is from a last definition of a variable to any use across a call interface.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*A coupling du-path is from the last definition of a variable to the first use of the same variable.*

***1 point***

State true or false: While testing for data flow in call interfaces, we need not consider only the last definition and the first use of a particular variable.

 True.

 False.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*False.*

***1 point***

While testing for sequencing constraints on specifications using graphs, what kind of test paths are tyically used?

 Test paths are defined to satisfy the sequencing constraints.

 Test paths are defined to violate the sequencing constraints.

 Test paths are dependent on the kind of sequencing constraints, might satisfy them are violate them.

 Test paths are the sequencing constraints themselves.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*Test paths are defined to violate the sequencing constraints.*

***1 point***

Consider a finite state machine that models the behaviour of a bounded queue data structure that is used in a piece of code. What do the states of the machine represent?

 The states of the finite state machine represent the operations supported by the queue data structure.

 The states of the finite state machine represent the contents of the queue, one state for every cell in the queue.

 It is not possible to represent a bounded queue data structure using a finite state machine.

 The states of the finite state machine represent the contents of the queue, one state when the queue is empty, one state when the queue has only one element, and so on, one state when the queue is full.

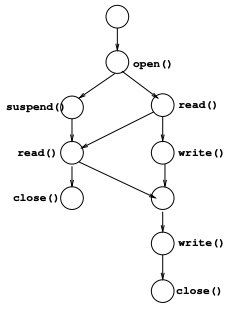
No, the answer is incorrect.  
Score: 0

Accepted Answers:

*The states of the finite state machine represent the contents of the queue, one state when the queue is empty, one state when the queue has only one element, and so on, one state when the queue is full.*

For the next four questions,consider the methods **open(), close(), read(), write()**, and **suspend()** which execute the operations of opening and closing a file, reading from a particular file, writing some data to a particular file and suspending an on-going operation, respectively. The sequencing constraints for the use of these methods are listed below.

* An **open()** method should always be eventually be followed by an invocation of the **closed()** method unless there is an invocation of **suspend()** in between.
* **read()** or **write()** methods cannot be invoked without opening a file, i.e., invoking an **open()** method.
* Every **open()** should have at least one **read()** or **write()** following its invocation, before closing the file.

The following graph captures the sequence of method calls regarding the usage of the above methods for a particular piece of code. The nodes that do not have labels represent some part of the code that does not invoke the above methods.  
  
Answer the following questions with reference to a set of test paths that might be written regarding the sequencing constraints for the considered piece of code.

***1 point***

State yes or no: Does the sequence of two consecutive invocations of the **write()** method violate any of the above sequencing constraints?

 Yes.

 No.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*No.*

***1 point***

State yes or no: Does the path that has two consecutive invocations of the **read()** method violate any of the above sequencing constraints?

 Yes.

 No.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*No.*

***1 point***

Identify a path that violates one of the above sequencing constraints from the paths given below.

 **Path: open(), read(), write(), write(), close().**

 **Path: open(), suspend(), read(), close().**

 **Path: open(), read(), read(), close().**

 **Path: open(), read(), read(), write(), close().**

No, the answer is incorrect.  
Score: 0

Accepted Answers:

***Path: open(), suspend(), read(), close().***

***1 point***

Does the edge from **open()** to **suspend()**, representing the suspension of an open operation violate any of the sequencing constraints given above?

 Yes.

 No.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*No.*

Week 4: Assignment 4 (Non graded)

***1 point***

If method AA uses a variable vv shared with method BB, where AA writes to vv and BB reads from vv, then, it is an example of which kind of coupling interface listed below?

 External device coupling.

 Parameter coupling.

 Interface coupling.

 Shared data coupling.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Shared data coupling.*

***1 point***

Choose an answer from the options below: A node in a callee function that defines a variable xx and has a def-clear path from the node through a call  
site to a caller function is referred to as . . . . . . . . ..



Last-def of xx.



Def of xx.



First-use of xx.



Use of xx.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Last-def of*xx*.*

***1 point***

State true or false: Both top-down and bottom-up integration testing work well with a hierarchical design.

 True.

 False.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*True.*

***1 point***

State true or false: Control flow graphs are finite state machines representing code.

 True.

 False.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*False.*

***1 point***

Which of the following best describes pre-conditions in finite state machines?

 They are conditions that must be true for transitions to be taken.

 They represent sequencing constraints that describe the order in which methods need to be called.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*They are conditions that must be true for transitions to be taken.*

Week 5 : Assignment 5

***1 point***

For a given propositional logic formula, if all possible assignments of true/false values to the atomic propositions make the formula evaluate to true, what is the formula called?

 The formula is a tautology.

 The formula is a satisfiable formula.

 The formula is a contradiction.

 The formula is invalid.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*The formula is a tautology.*

***1 point***

Consider the propositional logic formula φ=p∨q∨rφ=p∨q∨r. Which of the following true or false assignments to p,qp,q and rr make the formula φφ evaluate to false? In the options below TT represents True and FF represents False.



p=F,q=T,r=Fp=F,q=T,r=F.



p=T,q=F,r=Fp=T,q=F,r=F.



p=F,q=T,r=Tp=F,q=T,r=T.



p=F,q=F,r=Fp=F,q=F,r=F.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

p=F,q=F,r=Fp=F,q=F,r=F*.*

***1 point***

Which logic coverage criterion tests for all possible assignments of true/false values but can get infeasible due to there being a large number of assignments?

 Clause coverage.

 General active clause coverage.

 Correlated active clause coverage.

 All combinations coverage.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*All combinations coverage.*

***1 point***

Which of the following is a correct order of subsumption amongst logic coverage criteria? In the options below, read → as ‘subsumes’.

 Combinatorial coverage → General inactive clause coverage → Restricted inactive clause coverage.

 Combinatorial coverage → General active clause coverage → Restricted inactive clause coverage.

 Combinatorial coverage → Correlated active clause coverage → Predicate coverage.

 Combinatorial coverage → General active clause coverage → Correlated active clause coverage.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*Combinatorial coverage → Correlated active clause coverage → Predicate coverage.*

***1 point***

Consider a predicate pp and a clause aa in pp. When evaluating papa, the conditions under which clause aa determines pp, if we get a value False, what does this indicate?



papa evaluating to False indicates that is not possible for clause aa to determine pp.



papa evaluating to False indicates that clause aa always determines pp, irrespective of the truth values of the other clauses.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

papa*evaluating to False indicates that is not possible for clause*aa*to determine*pp*.*

For the next five questions, consider a simple predicate p¨=a˙∧bp¨=a˙∧b, with two clauses a˙a˙ and bb. Answer the following questions with reference to the logic coverage criteria for the predicate pp. The truth table for p¨p¨ is the table for the ∧∧ (AND) connective and is not given here. Please write the truth table and compute the true or false values for p¨,p¨ap¨,p¨a and p¨bp¨b, for true/false combinations for the clauses a˙a˙ and bb.

***1 point***

What is papa, the conditions under which clause aa determines pp?



pa=apa=a.



pa=bpa=b.



papa = True.



papa = False.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

pa=bpa=b*.*

***1 point***

What is pbpb, the conditions under which clause bb determines pp?



pb=apb=a.



pb=bpb=b.



pbpb = True.



pbpb = False.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

pb=apb=a*.*

***1 point***

State yes or no: CACC pairs for the clauses aa and bb are the same as GACC pairs.

 Yes.

 No.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*Yes.*

***1 point***

State yes or no: RACC pairs for the clauses aa and bb are the same as CACC pairs.

 Yes.

 No.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*Yes.*

***1 point***

State yes or no: RICC tuples for the clauses aa and bb are not the same as CACC tuples.

 Yes.

 No.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*Yes.*

Week 5: Assignment 5 (Non graded)

**Your last recorded submission was on 2024-10-24, 11:58 IST**

**Note : This assignment is only for practice purpose and it will not be counted towards the Final score**

***1 point***

State true or false: A clause is an expression that may or may not have logical connectives and also evaluates to a Boolean value.

 True.

 False.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*False.*

***1 point***

Which of the following represents papa , the conditions under which clause aa determines pp?



b∨cb∨c



b∧cb∧c



¬b∧¬c¬b∧¬c



¬b∨¬c¬b∨¬c

No, the answer is incorrect.  
Score: 0

Accepted Answers:

¬b∨¬c¬b∨¬c

***1 point***

Which of the following represents pcpc , the conditions under which clause cc determines pp?



a∨ba∨b



a∧ba∧b



¬a∧b¬a∧b



¬a∨¬b¬a∨¬b

Yes, the answer is correct.  
Score: 1

Accepted Answers:

¬a∧b¬a∧b

***1 point***

State true or false: There is only one GACC pair for clause bb.

 True

 False

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*True*

***1 point***

The set {(2, 6), (3, 7), (4, 8)} is the set of RACC pairs for which clause?



Clause a



Clause b



Clause c

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Clause*a

Week 6 : Assignment 6

**The due date for submitting this assignment has passed.**

**Due on 2024-09-04, 23:59 IST.**

Assignment submitted on 2024-09-04, 19:20 IST

***1 point***

Typically, how do logical constraints occur in pre-conditions and postconditions that specify assumptions on inputs to methods or describe the properties of the methods?

 The logical conditions can be any logical predicate.

 The logical conditions occur in conjunctive or disjunctive normal form.

 The logical conditions are a simple OR or AND combinations of two or more clauses.

 The logical conditions always describe what the methods should not process as inputs.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*The logical conditions occur in conjunctive or disjunctive normal form.*

***1 point***

State true or false: It is desired that a logical predicate used in a decision statement be a tautology.

 True.

 False.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*False.*

***1 point***

How do logical predicates occur in finite state machines?

 They occur as guards in the transitions of a finite state machine.

 They occur as predicates in the states of a finite state machine.

 They occur in the actions labeling the transitions of a finite state machine.

 They occur in the events of a finite state machine.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*They occur as guards in the transitions of a finite state machine.*

***1 point***

State true or false: The logical predicates occuring in the condition statements of a method are all simple propositional logic formulas.

 True.

 False

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*False*

Consider the following code that has two conditional statements and the corresponding two logical predicates. Answer the following questions with reference to logical coverage criteria on this code.

**import java.util.Scanner;**

**class Sum\_Odd\_Number**

**{**

**public static void main(String[] args)**

**{**

**Scanner input = new Scanner(System.in);**

**System.out.print("Enter The Number of Limit : ");**

**int l =input.nextInt();**

**int sum = 0;**

**for(int s=1;s<=l;s++)**

**{**

**if(s%2==1)**

**sum = sum + s;**

**}**

**System.out.println("Sum of Odd Numbers :"+sum);**

**}**

**}**

***1 point***

Which of the options below best describe what the above program computes?

 It computes the sum of all the numbers up to the limit l.

 It computes the sum of all the even numbers up to the limit l.

 It computes the sum of all the odd numbers up to the limit l.

 It computes the number of odd numbers up to the limit l.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*It computes the sum of all the odd numbers up to the limit l.*

***1 point***

How many clauses are there in the above program, per predicate?

 There are two predicates, each having one clause.

 There are two clauses in the program, to be considered as a part of the second predicate.

 There are four clauses in the program, two per predicate.

 There are l different clauses in the program, one for each iteration of the loop.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*There are two predicates, each having one clause.*

***1 point***

What does predicate coverage test for the second clause in the above program?

 It tests for the number being odd or even.

 It tests for the number being within or outside the limit.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*It tests for the number being odd or even.*

***1 point***

What does the test case for predicate coverage evaluating to true for the first predicate mean in the above program?

 The first predicate evaluating to true indicates repeated iterations of the for loop.

 The first predicate evaluating to true indicates exit from the for loop.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*The first predicate evaluating to true indicates repeated iterations of the for loop.*

***1 point***

State true or false: Clause coverage and predicate coverage are the same for both the predicates in the above program?

 True.

 False.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*True.*

***1 point***

In the ith iteration of the for loop, which of the following represents the actual predicate corresponding to the if statement?

 The predicate in the ith iteration is s%2 == 1.

 The predicate in the ith iteration is (1 + i)%2 == 1.

 The predicate in the ith iteration is i%2 == 1.

 The predicate in the ith iteration is 1%2 == 1.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*The predicate in the ith iteration is i%2 == 1.*

Week 6: Assignment 6 (Non graded)

**Your last recorded submission was on 2024-09-04, 19:21 IST**

**Note : This assignment is only for practice purpose and it will not be counted towards the Final score**

***1 point***

Where do logical predicates occur in finite state machines?

 They occur in the specification of finite state machines.

 They occur at decision points in finite state machines.

 They occur as guards in transitions of finite state machines.

 They occur in the nodes of finite state machines.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*They occur as guards in transitions of finite state machines.*

***1 point***

State yes or no: Predicate coverage for the first predicate **will not**ensure predicate coverage for the second predicate.

 Yes.

 No.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Yes.*

***1 point***

State yes or no: If a specification predicate is in Conjunctive Normal Form (CNF) then, a major clause can be made active by making all other clauses true.

 Yes.

 No.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Yes.*

Week 7 : Assignment 7

***1 point***

Which of the following statements are true regarding input space partitioning applied to the inputs of a particular software?

 Input space partitioning is a white-box testing technique that explores giving all possible inputs to the software for testing.

 Input space partitioning is a white-box testing technique that partitions the inputs according to the underlying code and passes inputs per partition for testing.

 Input space partitioning is a black-box testing technique that explores giving all possible inputs to the software for testing.

 Input space partitioning is a black-box testing technique that partitions the inputs according to the underlying requirements and passes inputs per partition for testing.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Input space partitioning is a black-box testing technique that partitions the inputs according to the underlying requirements and passes inputs per partition for testing.*

***1 point***

If a particular partitioning of an input space does not meet the ‘complete’ness criterion, what could go wrong in the test cases? Identify the most accurate answer option.

 A partition that does not satisfy the completeness criterion is not well-defined and hence the test cases can be wrong.

 A partition that does not satisfy the completeness criterion might leave out certain kinds of inputs for testing, possibly resulting in missing some errors.

 A partition that does not satisfy the completeness criterion cannot be used for testing as it means that a tester does not know all the inputs.

 A partition that does not satisfy the completeness criterion ceases to be a partition and hence cannot give good test cases.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*A partition that does not satisfy the completeness criterion might leave out certain kinds of inputs for testing, possibly resulting in missing some errors.*

***1 point***

Which of the following is a list of functional testing techniques that work with inputs and requirements for defining test cases?

 Decision tables, equivalence class partitioning, data flow testing.

 Equivalence class partitioning, data flow testing, boundary value analysis.

 Equivalence class partitioning, boundary value analysis, decision tables.

 Random testing, decision tables, input sets.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Equivalence class partitioning, boundary value analysis, decision tables.*

***1 point***

Which of the following gives the most expressive and the least expressive coverage criterion for input space partitioning?

 All combinations coverage is the most expressive and base choice coverage is the least expressive criterion.

 All combinations coverage is the most expressive and each choice coverage is the least expressive criterion.

 T-wise coverage (for large T) is the most expressive and pair-wise coverage is the least expressive criterion.

 Multiple base choice coverage is the most expressive and base choice coverage is the least expressive criterion.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*All combinations coverage is the most expressive and each choice coverage is the least expressive criterion.*

***1 point***

State true or false: Equivalence class partitioning is the same as input space partitioning, with pair-wise coverage.

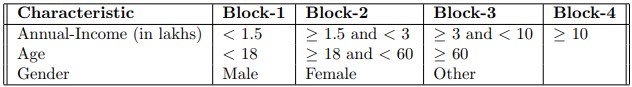
 True.

 False.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*False.*

For the next five questions, consider the input space as given below and answer the following questions.  
  


***1 point***

How many input characteristics are there in the above table and how many blocks or partitions are there per input characteristic?

 There are four input characteristics for the first input, three each for the second and the third inputs.

 There are three inputs and four blocks per input.

 There are three input characteristics and for the first input, there are four blocks, and three each for the second and third inputs.

 There are three input characteristics and totally four blocks per input.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*There are three input characteristics and for the first input, there are four blocks, and three each for the second and third inputs.*

***1 point***

What is the minimum number of tests required to satisfy each choice coverage on the above table?

 Three.

 Four.

 Nine.

 Thirty six.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Four.*

***0 points***

What is the minimum number of tests required (considering same test case to cover more than one unique pair of values) to satisfy each pairwise coverage (PWC) criterion?

 Four.

 Eight.

 Fifteen.

 Thirty six.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*Fifteen.*

***1 point***

Suppose the base choice test is (annualIncome = 2 lakhs, age = 20, gender = ‘MALE’). What is the minimum number of tests required (including the base choice test case) to satisfy each base choice coverage (BCC) criterion?

 Four.

 Eight.

 Fifteen.

 Thirty six.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Eight.*

***1 point***

State yes or no: Will the number of tests for all combinations coverage for this table be more than the number of tests for base choice coverage, as above?

 Yes.

 No.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Yes.*

Week 7: Assignment 7 (Non graded)

**Your last recorded submission was on 2024-09-11, 13:15 IST**

**Note : This assignment is only for practice purpose and it will not be counted towards the Final score**

***1 point***

State true or false: In functional testing, decision tables handle multiple inputs by considering different combinations of equivalence classes, with conditions handling the combinations.

 True.

 False.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*True.*

***1 point***

In equivalence class based testing, how does each partition help in testing?

 When the program under test is run on any input from each partition, it will produce the same output.

 Any input from each partition is good enough to test the program, it serves as a good source for selecting inputs.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*When the program under test is run on any input from each partition, it will produce the same output.*

***1 point***

In boundary value analysis, if the partition of inputs specifies an ordered set, which of the following best describes the guidelines to be used to choose test case inputs?

 Construct test cases by specifying boundary points.

 Construct test cases at the boundary of each partition.

 Construct test cases by choosing minimum and maximum values.

 Construct test cases by choosing the first and the last elements of the set.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Construct test cases by choosing the first and the last elements of the set.*

***1 point***

What are the variables involved in the **NextDate** function input?

 Month, day and year.

 Date containing month, day and year.

 Today’s date.

 Range of dates.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Date containing month, day and year.*

***1 point***

State true or false: The partition  
  
(1){month: month has 30 days}, (2){month: month has 31 days}, (3){month: month is February}  
  
is a valid partition for month as a part of input to **NextDate** function?

 True.

 False.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*True.*

Week 8 : Assignment 8

**The due date for submitting this assignment has passed.**

**Due on 2024-09-18, 23:59 IST.**

**As per our records you have not submitted this assignment.**

***1 point***

Which of the following is a correct regular expression for the language of all binary words (over the alphabet {0, 1}) that begin with a 0 and end with a 1?



0+(0+1)∗+10+(0+1)∗+1



0⋅(0⋅1)∗⋅10·(0·1)∗·1



0⋅(0+1)∗⋅10·(0+1)∗·1



(0⋅(0+1)∗⋅1)∗(0·(0+1)∗·1)∗

No, the answer is incorrect.  
Score: 0

Accepted Answers:

0⋅(0+1)∗⋅10·(0+1)∗·1

***1 point***

Suppose a programming language has identifier names from the lower case English alphabet that can be exactly of length three. Which of the following is a regular expression that corresponds to these identifier names?



(a+b+c+...+z)⋅(a+b+c+...+z)⋅(a+b+c+...+z)(a+b+c+...+z)·(a+b+c+...+z)·(a+b+c+...+z)



(a⋅b⋅c⋅...⋅z)+(a⋅b⋅c⋅...⋅z)+(a⋅b⋅c⋅...⋅z)(a·b·c·...·z)+(a·b·c·...·z)+(a·b·c·...·z)



(a+b+c+...+z)∗(a+b+c+...+z)∗



(a+b+c+...+z)⋅(a+b+c+...+z)⋅(a+b+c+...+z)∗(a+b+c+...+z)·(a+b+c+...+z)·(a+b+c+...+z)∗

No, the answer is incorrect.  
Score: 0

Accepted Answers:

(a+b+c+...+z)⋅(a+b+c+...+z)⋅(a+b+c+...+z)(a+b+c+...+z)·(a+b+c+...+z)·(a+b+c+...+z)

***1 point***

Which are the three levels in which the syntax of a programming language is typically given?

 Characters, tokens, words and phrases.

 Words, phrases and context that specifies types, variable references etc.

 Regular expressions and context-free languages.

 Regular expressions and context-free grammars.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*Words, phrases and context that specifies types, variable references etc.*

***1 point***

State true or false: If a mutant is strongly killed, it is also weakly killed.

 True.

 False.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*True.*

***1 point***

If an expression of the form if **(a <= b)** is replaced with if **(true),** then it is an application of which of the mutation operators below?

 Boolean constant replacement.

 Logical operator replacement.

 Relational operator replacement.

 True operator replacement.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*Relational operator replacement.*

For the next five questions, consider the code snippet below and the mutation given in line 4. Answer the following with reference to mutation testing of the code snippet below.

**1 public static int findVal(int array\_num[], int Val)**

**2 {**

**3 int findVal = -1;**

**4 for (i=0; i < array\_num.length; i++)**

**4 for (i=1; i < array\_num.length; i++)**

**5    if (array\_num[i] == Val)**

**6       findVal = i;**

**7. return (findVal);**

**8. }**

***1 point***

Identify the mutation operator that is applied at statement **4** in the above code snippet.

 Arithmetic operator replacement.

 Loop initialization replacement.

 Scalar variable replacement.

 Constant value replacement.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*Scalar variable replacement.*

***1 point***

Can the mutant be reached if the input array is empty?

 Yes.

 No.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*Yes.*

***1 point***

State Yes or No: Is it possible that infection of the mutation occurs when the input array is the empty array?

 Yes.

 No.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*No.*

***1 point***

Which of the following test cases ensures that the mutated statement is infected but propagation does not occur?

 A test case with the value not in the array will ensure that infection occurs and propagation does not occur.

 A test case in which the last occurrence of the value is not in array num[0] will ensure infection and not propagation.

 A test case in which the element occurs exactly once in the array will ensure that infection occurs and propagation does not occur.

 A test case in which the last occurrence of the value is anywhere except in the first position will ensure that infection occurs and propagation does not occur.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*A test case in which the last occurrence of the value is not in array num[0] will ensure infection and not propagation.*

***1 point***

Which of the following test cases will strongly kill the mutant?

 A test case in which the value is not in the array will strongly kill the mutant.

 A test case in which the value occurs exactly once at any position in the array will strongly kill the mutant.

 A test case in which the value is in the first position of the array will strongly kill the mutant.

 A test case in which the value is not in the first position of the array will strongly kill the mutant.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*A test case in which the value is in the first position of the array will strongly kill the mutant.*

Week 8 : Assignment 8 (Non Graded)

**Your last recorded submission was on 2024-09-11, 13:17 IST**

**Note : This assignment is only for practice purpose and it will not be counted towards the Final score**

***1 point***

State true or false: Regular expressions and context free grammars are used to determine how characters form tokens and tokens form words in the syntax of a programming language.

 True.

 False.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*True.*

***1 point***

In the list of mutation operators for source code, the Boolean constants *True* and *False* can be used to replace which of the following operators?

 They can replace logical operators only.

 They can replace relational operators only.

 They can replace conditional operators only.

 They can replace both logical and relational operators.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*They can replace both logical and relational operators.*

***1 point***

When is a mutant said to be a trivial mutant?

 A mutant is trivial if it is functionally equivalent to its ground string.

 A mutant is trivial if it can be killed by almost any test case.

 A mutant is trivial if it is invalid.

 A mutant is trivial if all logical and relational operators are replaced by the constant *True*.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*A mutant is trivial if it can be killed by almost any test case.*

***1 point***

State true or false: Strongly killing a mutant and weakly killing a mutant are the same in mutation testing applied to test a method.

 True.

 False

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*False*

***1 point***

State true or false: Mutation testing subsumes combinatorial logic coverage criterion.

 True.

 False.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*False.*

Week 9 : Assignment 9

**The due date for submitting this assignment has passed.**

**Due on 2024-09-25, 23:59 IST.**

Assignment submitted on 2024-09-23, 14:33 IST

***1 point***

Which of the following statements are true about mutation testing applied at the various stages of the software development life-cycle?

 Mutation can be applied to programs, input strings and to design artifacts. In all the cases, test cases are written to kill the mutants.

 Mutation can be only applied to programs and test cases can be written to kill the mutants.

 Mutation can be applied to programs, inputs and to design artifacts. Test cases can be written to kill the mutants for programs and design artifacts, not for input mutations.

 Mutation can be applied only to individual methods, not for inputs and design artifacts. Test cases can be written to kill the mutants.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Mutation can be applied to programs, inputs and to design artifacts. Test cases can be written to kill the mutants for programs and design artifacts, not for input mutations.*

***1 point***

State yes or no: Are there mutation operators available for inputs that are XML files that are used in web applications?

 Yes.

 No.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*Yes.*

***1 point***

Consider a method A calling another method B, with the callee method B returning an integer back to method A. In a particular mutation, the method call for B is deleted and instead of the return statement, an integer constant is added in the same statement in method A. Which type of mutation will this be?

 Integration method replacement.

 Integration method call deletion.

 Integration method return value change.

 Integration callee method change.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Integration method call deletion.*

***1 point***

Suppose the access level for a method M in a particular class C is changed and this change denies access to the method M for one of the child classes of C. Which mutation operator has been applied here and has the resulting mutant been successfully killed?

 Overriding method change operator has been applied and the resulting mutant has been killed.

 Overriding method deletion operator has been applied and the resulting mutant has been killed.

 Method access has been changed and it need not mean that the resulting mutant has been successfully killed.

 Access modifier change mutation operator has been applied and the resulting mutant has been successfully killed.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Access modifier change mutation operator has been applied and the resulting mutant has been successfully killed.*

***1 point***

Is method overloading different from method overriding and if yes, what is the main difference?

 Method overloading and method overriding are the same.

 Method overloading is different from method overriding. In the former case, the two methods are in the same class and in the latter case, the method is present in a class and one of its descendants.

 Method overloading is different from method overriding. In the former case, the method is present in a class and one of its descendants, and in the latter case, the two methods are in the same class.

 Method overloading and method overriding are nearly the same where two different pieces of code are given to the same method.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Method overloading is different from method overriding. In the former case, the two methods are in the same class and in the latter case, the method is present in a class and one of its descendants.*

***1 point***

When a particular variable belonging to a class is such that there is only one copy of the variable for the entire class, what is the associated declaration of the variable called?

 Static.

 Private.

 Instance.

 Protected.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Static.*

***1 point***

How we say that mutation testing subsumes node and edge graph coverage criteria despite the fact that these are two different testing techniques?

 Mutation testing does not subsume node and edge coverage criteria.

 Mutation testing is a weaker testing technique than node and edge coverage criteria.

 We consider weak mutation and specific mutation operators for the given subsumption.

 We consider strong mutation and specific mutation operators for the given subsumption.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*We consider weak mutation and specific mutation operators for the given subsumption.*

Consider the code snippet below and answer the following two questions below.

**public class Main {**

**int x;**

**// Constructor with a parameter**

**public Main(int x) {**

**this.x = x;**

**}**

**// Call the constructor**

**public static void main(String[] args) {**

**Main myObj = new Main(5);**

**System.out.println("Value of x = " + myObj.x);**

**}**

**}**

***1 point***

What is the use of the this keyword above?

 It refers to the current object in the constructor.

 It invokes the current class method.

 It is used to pass an argument whose value is not clear.

 It is a method parameter

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*It refers to the current object in the constructor.*

***1 point***

What will the output of the above code snippet be if the this keyword is omitted?

 Output will be unknown.

 Output will be 0.

 Output will be 5.

 There will be no output.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*Output will be 0.*

***1 point***

Will the mutant that is created by a mutation that deletes the this keyword be killed by any test case? State yes or no.

 Yes.

 No.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Yes.*

Week 9: Assignment 9 (Non graded)

**Your last recorded submission was on 2024-09-23, 14:28 IST**

**Note : This assignment is only for practice purpose and it will not be counted towards the Final score**

***1 point***

While applying the mutation operator that deletes a method call, how is the value returned by the deleted method passed to the caller method?

 The method itself is deleted, so the call should also be deleted.

 The value returned by the deleted method is replaced with a suitable expression in the caller.

 The value returned by the deleted method is replaced with a fixed, constant value.

 A message is sent to the caller indicating that there is no value to be returned as the method is deleted.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*The value returned by the deleted method is replaced with a fixed, constant value.*

***1 point***

When mutation testing is applied for inputs to programs, which of the following software artifacts are mutated?

 Inputs are mutated.

 The program or the ground string is mutated.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Inputs are mutated.*

***1 point***

How is overloading different from overriding in object oriented programming?

 Overloading occurs between two methods in the same class and overriding occurs between methods in a class and one of its descendants.

 Overloading occurs between a method in a class and one of its descendants and overriding occurs between two methods in the same class.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Overloading occurs between two methods in the same class and overriding occurs between methods in a class and one of its descendants.*

***1 point***

State true or false: The mutation operators overriding method moving and overriding method deletion will cause references to the method on which it is applied to use the parent’s version.

 True.

 False.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*True.*

Week 10 : Assignment 10

**The due date for submitting this assignment has passed.**

**Due on 2024-10-02, 23:59 IST.**

Assignment submitted on 2024-09-26, 13:54 IST

***1 point***

As discussed in the videos, which are the major kinds of testing applicable to test the functionality of web applications?

 Testing of web services, static and dynamic web applications.

 Testing of static and dynamic web sites.

 Client-side testing and server-side testing.

 Black-box testing and white-box testing.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*Client-side testing and server-side testing.*

***1 point***

What is the main idea in bypass testing of web applications?

 Bypass testing deletes all the client-side validation checks and saves the data to send to the server.

 Bypass testing technique removes some of the client-side validation checks and sends modified data to the server to check for server responses.

 Bypass testing sends data to another server by modifying the destination details.

 Bypass testing changes the HTML constraints of the data sent by the web client.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Bypass testing technique removes some of the client-side validation checks and sends modified data to the server to check for server responses.*

***1 point***

Which of the following is the main issue tested for in a static website?

 Testing for non-functional properties.

 Checking if there is at least one HTML hyperlink.

 Testing for dead links.

 Testing using breadth first search.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Testing for dead links.*

***1 point***

If a web application contains a collection of web pages that are created based on the inputs given by a user or a client, which is the kind of underlying web application?

 Static website.

 Dynamic website.

 Web service.

 Client-varying website.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Dynamic website.*

***1 point***

Consider an Application Transition Graph (ATG), modeling a piece of some server code. A transition out of the code’s execution modeling the pressing of a back or a forward button is called by which term?

 Simple link transition.

 Form link transition.

 Oprational transition.

 Redirect transition.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*Oprational transition.*

***1 point***

What are the different data layers present in the architecture of a web application?

 Data at the client-side and data at the server-side.

 Data content, data presentation and data storage layers.

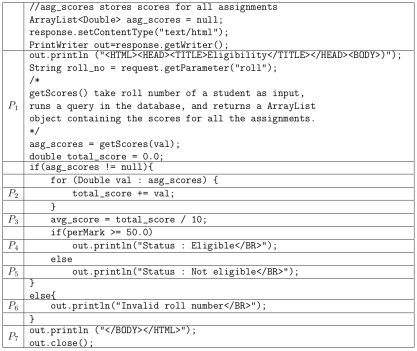
 Data input and data output layers.

 Data at the unit level and integration level.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Data content, data presentation and data storage layers.*

Consider the Java Servlet code given in the image below. It is a simple code that takes as input, a student’s roll number and after running a query, outputs the scores of the assignments. The atomic sections are marked in the code as PiPi, for 1≤i≤71≤i≤7. Answer the following questions with respect to testing of this server-side code.  
  


***1 point***

State yes or no: Is there an empty atomic section in the given code?

 Yes.

 No.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*No.*

***1 point***

Identify the atomic sections that occur as choices in the sense that only one of them will be selected for generating the website.

 There are no atomic sections with choice in the given code.



The atomic sections with choice are P4P4 and P5P5.



The atomic sections with choice are (1) P4P4 and P5P5, and (2) P3P3 and P6P6.



The atomic sections with choice are (1) P4P4 and P5P5, and (2) P1P1 and P6P6.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*The atomic sections with choice are (1)*P4P4*and*P5P5*, and (2)*P3P3*and*P6P6*.*

***1 point***

What do the atomic sections P1P1 and P7P7 take care of in the given code?

 These atomic sections take care of generating the header and body tags of the HTML file that will be sent to the client browser.

 These atomic sections ensure that correct data is sent to the server by the client.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*These atomic sections take care of generating the header and body tags of the HTML file that will be sent to the client browser.*

***1 point***

Identify the component expression corresponding to the given code.



P1⋅((P∗2⋅P3⋅(P4|P5))|P6)⋅P7P1·((P2∗·P3·(P4|P5))|P6)·P7.



P1⋅((P2|P3)⋅(P4|P5)|P6)⋅P7P1·((P2|P3)·(P4|P5)|P6)·P7.



P1⋅(P2⋅P3⋅(P4|P5)|P6)⋅P7P1·(P2·P3·(P4|P5)|P6)·P7



P1⋅(((P2|P3)⋅(P4|P5))|P6)⋅P7P1·(((P2|P3)·(P4|P5))|P6)·P7.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

P1⋅((P∗2⋅P3⋅(P4|P5))|P6)⋅P7P1·((P2∗·P3·(P4|P5))|P6)·P7*.*

Week 10: Assignment 10 (Non graded)

**Your last recorded submission was on 2024-09-23, 14:42 IST**

**Note : This assignment is only for practice purpose and it will not be counted towards the Final score**

***1 point***

If a descendent class does not override any inherited method and there is no polymorphic behaviour, then which fault/anomaly does it represent?

 State definition anomaly.

 Polymorphic behaviour anomaly.

 Inconsistent type use fault.

 State visibility anomaly.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Inconsistent type use fault.*

***1 point***

Do the coverage criteria “All-Coupling-Sequences” and “All-Coupling- Defs-Uses” consider polymorphism?

 These two criteria consider only inheritance and not polymorphism.

 These two criteria also consider polymorphism.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*These two criteria also consider polymorphism.*

***1 point***

Which of the following lists different kinds of client side testing for web applications?

 Testing based on user history that is logged at the server.

 Testing based on screens that a user passes through while navi- gating.

 Testing based on clients bypassing different kinds of server validation.

 Testing based on user session data and on bypassing client side validation.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Testing based on user session data and on bypassing client side validation.*

***1 point***

Why are control flow graphs not suitable for web applications testing?

 It is not clear whether to consider models for client or server.

 They are static models and do not represent dynamic flow of control.

 There are no control flow graph models in code for web applications.

 Just control flow is not enough, we need to consider data flow also.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*They are static models and do not represent dynamic flow of control.*

***1 point***

When a user of a web application presses “Refresh” button due to delay in loading a page, what kind of transition does it cause in the underlying component interaction model?

 It causes a simple link transition.

 It causes a redirect transition.

 It causes an operational transition.

 It causes a reload transition.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*It causes an operational transition.*

Week 11 : Assignment 11

**The due date for submitting this assignment has passed.**

**Due on 2024-10-09, 23:59 IST.**

Assignment submitted on 2024-10-09, 09:41 IST

***1 point***

Which of the following lists use(s) of symbolic execution in logic-based testing?

 Symbolic execution is used to generate the predicates for logic-based testing.

 Symbolic execution is used to reach the predicates for applying logicbased testing.

 Symbolic execution is used to solve the reachability and infection problems for logic-based testing.

 Symbolic execution is used to compute the predicates for logic-based testing

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*Symbolic execution is used to solve the reachability and infection problems for logic-based testing.*

***1 point***

When symbolic execution of a piece of code reaches a decision statement (like if), what kind of path constraints are generated?

 One path constraint, True is always generated.

 One path constraint containing the predicate of the decision statement is generated.

 Two path constraints are generated, one corresponding to the predicate with symbolic variables as it occurs in the decision statement and another corresponding to the negation of the same predicate with symbolic variables.

 Two path constraints are generated, corresponding to the predicate and negation of the predicate, as it occurs in the decision statement, with symbolic variables, and these are combined with a logical AND to the existing path constraint.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*Two path constraints are generated, corresponding to the predicate and negation of the predicate, as it occurs in the decision statement, with symbolic variables, and these are combined with a logical AND to the existing path constraint.*

***1 point***

State yes or no: Can symbolic execution be used to detect the presence of non-terminating loops in a given code?

 Yes.

 No.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*No.*

***1 point***

Which of the following is a list of all known disadvantages of symbolic execution?

 Symbolic execution is not an expressive testing technique for exploring all execution paths.

 Symbolic execution will generate path constraints that are not solvable by known constraint solvers.

 Symbolic execution will not work for code bases that use API calls and hence not useful.

 Symbolic execution can generate path constraints that are not solvable by known constraint solvers, it will not work for code that contains functions whose source code is not available, and when there are many different program paths, the path constraints might get large, making it infeasible.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Symbolic execution can generate path constraints that are not solvable by known constraint solvers, it will not work for code that contains functions whose source code is not available, and when there are many different program paths, the path constraints might get large, making it infeasible.*

***1 point***

State true or false: DART algorithm, when run on a program, always terminates.

 True.

 False.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*False.*

Consider the code fragment below. It is written in a generic programming language, and doesn’t represent a full executable piece of code. Answer the following questions related to the symbolic execution of the given code fragment.

1   int x, y;

2   if (x > y) {

3       x = x + y;

4       y = x - y;

5       x = x - y;

6       if (x - y > 0)

7       assert(false);

8   }

***1 point***

What does the code fragment do?

 Tries to check if x is greater than y.

 Tries to check if y is greater than x.

 Swaps the values x and y.

 Swaps the values of x and x - y.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Swaps the values x and y.*

***1 point***

How many nodes will be there in the symbolic execution tree of this code fragment?

 3 nodes.

 4 nodes.

 7 nodes.

 8 nodes.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*8 nodes.*

***1 point***

What will be the path constraint at line 1 of the code fragment such that no further execution happens?

 x > y.

 x <= y.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*x <= y.*

***1 point***

What will be the path constraint to reach statement 6?

 x > y && x - y > 0.

 x > y && x - y <= 0.

 x <= y.

 x > y && x - y <= 0.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*x > y && x - y > 0.*

***1 point***

Is statement 6 reachable in the given program fragment?

 Yes, it is reachable.

 No, it is not reachable.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*No, it is not reachable.*

Week 11: Assignment 11 (Non graded)

**Your last recorded submission was on 2024-10-09, 09:39 IST**

**Note : This assignment is only for practice purpose and it will not be counted towards the Final score**

***1 point***

Which of the following best defines symbolic testing?

 A white box testing technique that executes all decision statements once.

 A white box testing technique that executes all possible execution paths in the control flow graph.

 A testing technique based on logical predicates being true.

 A testing technique that works with branches and loops in the control flow graph of a program.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*A white box testing technique that executes all possible execution paths in the control flow graph.*

***1 point***

Which of the following is a list of disadvantages of symbolic execution?

 Generating too many path constraints, even if they are all solvable.

 Generating too many path constraints and many of them are unsolvable.

 Generating unsolvable path constraints, code containing functions whose source code is not available.

 Generating unsolvable path constraints, managing difficult program paths.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Generating unsolvable path constraints, code containing functions whose source code is not available.*

***1 point***

State true or false: Symbolic execution can be terminated if the program under execution reaches an exit statement or encounters an error.

 True.

 False.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*True.*

***1 point***

State true or false: Symbolic testing can always detect non-terminating loops.

 True.

 False.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*False.*

Week 12 : Assignment 12

**The due date for submitting this assignment has passed.**

**Due on 2024-10-16, 23:59 IST.**

Assignment submitted on 2024-10-16, 11:33 IST

***1 point***

Which of the following is a list of quality attributes that are tested using techniques for non-functional testing?

 Interoperability, functionality, security

 Security, performance, reliability

 Functionality, usability, scalability

 Testability, performance, controllability

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Security, performance, reliability*

***1 point***

State true or false: Security testing also involves testing for authorization and authentication policies that grant access permissions to users for files.

 True

 False

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*True*

***1 point***

Which of the following best defines regression testing?

 Testing done on the entire software each time a part of it is modified

 Testing done with modified and other relevant parts of software, whenever modifications are done

 Testing done for the functionality of the entire software when it is modified

 Re-executing all the test cases and some new test cases on software each time it is modified

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Testing done with modified and other relevant parts of software, whenever modifications are done*

***1 point***

State true or false: Regression testing is a white-box testing technique.

 True

 False

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*False*

***1 point***

In regression testing, which of the following is done before test case selection?

 Identifying coverage criteria

 Writing a new set of test cases for the modified program

 Identifying obsolete test cases that are invalid for the modified program

 Executing all the test cases for the original program again

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Identifying obsolete test cases that are invalid for the modified program*

***1 point***

Which of the following is not a software quality metric?

 Product quality metrics

 Functional quality metrics

 In-process quality metrics

 Maintenance quality metrics

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*Functional quality metrics*

***1 point***

State true or false: Documentation testing involves verifying the troubleshooting guide with actual errors.

 True

 False

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*True*

***1 point***

While testing mobile applications, which of the following testing techniques addresses device fragmentation issues?

 Functional testing

 System testing

 Usability testing

 Security testing

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*Usability testing*

***1 point***

Which of the following types of testing is performed to measure the ability of a system to keep operating over specified periods (typically several months or years) of time?

 Compatibility testing

 Security testing

 Reliability testing

 Performance testing

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Reliability testing*

***1 point***

State yes or no: In a piece of Java code over a class inheritance hierarchy that uses methods that are overridden, can all the method calls be determined statically?

 Yes

 No

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*No*

Week 12: Assignment 12 (Non graded)

**Your last recorded submission was on 2024-10-09, 09:47 IST**

**Note : This assignment is only for practice purpose and it will not be counted towards the Final score**

***1 point***

Testing for forward compatibility involves testing for which kind of the following features?

 Testing to accept inputs intended for modern versions of the operating system.

 Testing to accept inputs intended for a former version of the software itself.

 Testing to accept inputs for a latter version of the software itself.

 Testing to accept inputs intended for a new version of third party products the software interacts with.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Testing to accept inputs for a latter version of the software itself.*

***1 point***

Which of the following is a list of black box testing techniques?

 Logic-based testing, performance testing, stress testing.

 Load testing, stress testing, testing for covering loops.

 Testing based on partitioning inputs, load testing, stress testing.

 Compatibility testing, functional testing, data flow testing.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Testing based on partitioning inputs, load testing, stress testing.*

***1 point***

Which of the following best defines a polymorphic call set?

 All the polymorphic methods.

 All the methods that the designer wants to be polymorphic.

 Set of polymorphic methods that can get executed in a class.

 Set of methods that can potentially execute as result of a method call through a particular instance context.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Set of methods that can potentially execute as result of a method call through a particular instance context.*

***1 point***

Testing for mobile phones apps at middleware and device level is done using which of the following?

 Mobile phones themselves.

 Application development environment.

 Emulators that are custom-built.

 Application within the phone.

Yes, the answer is correct.  
Score: 1

Accepted Answers:

*Emulators that are custom-built.*