X

Assignment 1

The due date for submitting this assignment has passed.

Due on 2020-09-30, 23:59 IST.

Assignment submitted on 2020-09-30, 23:16 IST

1) Which of the following best defines a test case as per the lectures? ***1 point***

- 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.

2) Which of the following represents a failed test case execution? ***1 point***

- The program doesn't complete execution when run with the test case and stops with an error or exception.
- The program produces an output different from expected output.

Yes, the answer is correct.
Score: 1
Accepted Answers:
The program produces an output different from expected output.

3) Which of the following represents usability testing? ***1 point***

- 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.

4) For a tester to observe an error or a fault in a particular location of a program, which of the following should be true? ***1 point***

- The location of the program should be reachable by the test case given by the tester.
- The location of the program should be reachable by the test case given by the tester and the state of the program must be incorrect at that location.
- In addition to the above two conditions, the final state of the program should be incorrect.
- The tester should see the error in the program.

Yes, the answer is correct.
Score: 1
Accepted Answers:
In addition to the above two conditions, the final state of the program should be incorrect.

5) When do we say that a set of test cases T satisfies test requirements TR for a coverage criterion C. ***1 point***

- For every test requirement $tr \in TR$, there is exactly one test case $t \in T$ such that t satisfies tr.
- For some test requirement $tr \in TR$, there is some test case t such that $t \in T$ such that t satisfies tr.
- For some test requirement $tr \in TR$, all the test cases $t \in T$ are such that t satisfies tr.
- For every test requirement $tr \in TR$, there is at least one test case $t \in T$ such that t satisfies tr.

Yes, the answer is correct.
Score: 1
Accepted Answers:
For every test requirement $tr \in TR$, there is at least one test case $t \in T$ such that t satisfies tr.

6) When do we say that a coverage criterion C_1 subsumes C_2 ? ***1 point***

- C_1 subsumes C_2 iff some test case that satisfies C_1 also satisfies C_2 .
- C_1 subsumes C_2 iff every test case that satisfies C_1 also satisfies C_2 .

Yes, the answer is correct.
Score: 1
Accepted Answers:
C_1 subsumes C_2 iff every test case that satisfies C_1 also satisfies C_2 .

7) What does the JUnit assertion `assertFalse(val1 > val2)` return when `val1` is greater than `val2`? ***1 point***

- True.
- False.

Yes, the answer is correct.
Score: 1
Accepted Answers:
False.

8) State true or false: In JUnit, if you allocate external resources in a @Before method, you need to release them after the test runs using an @After method. ***1 point***

- (●) True.
- ( ) False.

Yes, the answer is correct.
Score: 1

Accepted Answers:
True.

9) In which of the levels of testing, do testers use testing to show errors in software? ***1 point***

- (●) Level 3.
- ( ) Level 4.

Yes, the answer is correct.
Score: 1

Accepted Answers:
Level 3.

10) Which of the following represents an adjacent activity in testing? ***1 point***

- ( ) Test automation.
- ( ) Test execution.
- ( ) Test evaluation.
- (●) Test documentation.

Yes, the answer is correct.
Score: 1

Accepted Answers:
Test documentation.

X

Assignment 2

The due date for submitting this assignment has passed.

Due on 2020-09-30, 23:59 IST.

Assignment submitted on 2020-09-30, 22:13 IST

1) Given a graph corresponding to control graph of a method, which of the options below define a reachable node? ***1 point***

- A node is said to be reachable if there is a path from any other node to that node in the graph.
- A node is said to be reachable if there is a path from the initial node to that node in the graph.

Yes, the answer is correct.
Score: 1
Accepted Answers:
A node is said to be reachable if there is a path from the initial node to that node in the graph.

2) When do we say that a test path *p* tours a path *q* ***1 point***

- 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.

3) State true or false: In control flow graphs corresponding to functions or methods, strongly connected components correspond loops in the control flow. ***1 point***

- True.
- False.

Yes, the answer is correct.
Score: 1
Accepted Answers:
True.

The following graph will be used for the remaining seven questions of this section, on structural graph coverage criteria. Please draw the graph. Consider a graph $G = (V, E)$ where the set of nodes V = {1, 2, 3, 4, 5, 6, 7}, initial node is 1, final node is 7 and the set of edges E is {(1, 2), (1, 7), (2, 3), (2, 4), (3, 2), (4, 5), (4, 6), (5, 6), (6, 1)}.

4) How many requirements are there for edge pair coverage? ***1 point***

- 10 requirements.
- 12 requirements.

Yes, the answer is correct.
Score: 1
Accepted Answers:
12 requirements.

5) Consider the test paths t_0 = [1, 2, 4, 5, 6, 1, 7] and t_1 = [1, 2, 3, 2, 4, 6, 1, 7]. Do the test paths t_0 and t_1 satisfy edge pair coverage? ***1 point***

- Yes, it covers all the edge pairs.
- No, they leave out edge pairs [3, 2, 3] and [6, 1, 2].

Yes, the answer is correct.
Score: 1
Accepted Answers:
No, they leave out edge pairs [3, 2, 3] and [6, 1, 2].

6) Which of the following test paths satisfy node coverage but not edge coverage on the graph? ***1 point***

- 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].

7) How many test requirements are there for prime path coverage in this graph? ***1 point***

- 16 requirements.
- 14 requirements.
- 12 requirements.
- 15 requirements.

Yes, the answer is correct.
Score: 1
Accepted Answers:
15 requirements.

8) What do the prime paths [2, 3, 2] and [3, 2, 3] together represent? ***1 point***

- 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.

9) What is the longest length prime path that can be found in this graph *G*? ***1 point***

- Longest length prime path will have length (number of edges) 6.
- Longest length prime path will have length (number of edges) 7.

Yes, the answer is correct.
Score: 1

Accepted Answers:
Longest length prime path will have length (number of edges) 6.

10) 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? ***1 point***

- 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].

X

Assignment 3

The due date for submitting this assignment has passed.

Due on 2020-10-07, 23:59 IST.

Assignment submitted on 2020-10-06, 21:44 IST

1) Which of the following best defines a linearly independent path of execution in the CFG of a program? ***1 point***

- 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.

No, the answer is incorrect.
Score: 0

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

2) Given a variable v in a program, when do we say that a definition of v at a location l_i reaches a use at a location l_j ? ***1 point***

- We say that the definition of v at l_i reaches its use at l_j if there is a path from l_i to l_j in the CFG of the program.
- We say that the definition of v at l_i reaches its use at l_j if there is a def-clear path from l_i to l_j in the CFG of the program.

Yes, the answer is correct.
Score: 1

Accepted Answers:

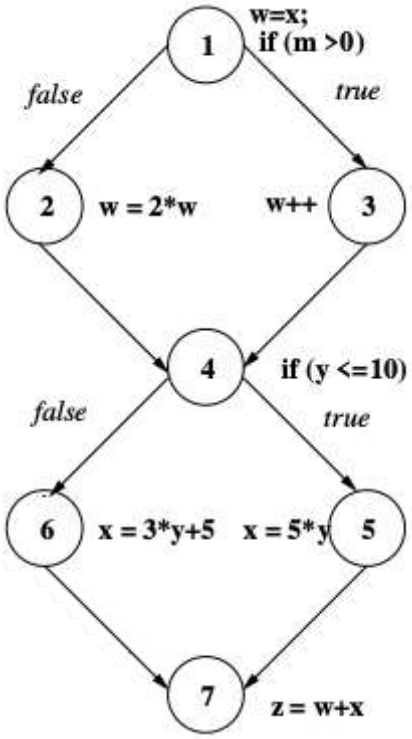
We say that the definition of v at l_i reaches its use at l_j if there is a def-clear path from l_i to l_j in the CFG of the program.

3) State true or false: All uses coverage criterion subsumes edge coverage criterion. ***1 point***

- (•) True
- ( ) False

Yes, the answer is correct.
Score: 1
Accepted Answers:
True

The following description is that of a CFG whose nodes are labelled with statements involving five different variables, namely, x, y, w, z and m. The CFG corresponds to a program fragment that has two decision statements. Answer the following questions with respect to this CFG and the definitions and uses of the variables, as per the statements.



4) Which of the following is a list of nodes having defs for variable w? ***1 point***

- (•) Nodes 1, 2, 3 have defs for w.
- ( ) Nodes 2 and 3 have defs for w.

Yes, the answer is correct.
Score: 1
Accepted Answers:
Nodes 1, 2, 3 have defs for w.

5) Which of the following is a list of nodes having uses for variable w? ***1 point***

Nodes 2, 3, and 7 have uses for w.

Nodes 2 and 3 have uses for w.

Yes, the answer is correct.
Score: 1

Accepted Answers:
Nodes 2, 3, and 7 have uses for w.

6) State true or false: Nodes 4, 5 and 6 have uses for variable x. **1 point**

True

False

Yes, the answer is correct.
Score: 1

Accepted Answers:
False

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

Yes

No

Yes, the answer is correct.
Score: 1

Accepted Answers:
No

8) Does the statement at node 7 correspond to a definition or a use for the variable z? **1 point**

It corresponds to a definition of z.

It corresponds to a use of z.

Yes, the answer is correct.
Score: 1

Accepted Answers:
It corresponds to a definition of z.

9) Which of the following is a list of du-paths for the variable w? **1 point**

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].

10) Which of the following is a list of du-paths for the variable x? **1 point**

Paths [5, 7] and [6, 7].

Paths [5, 7], [6, 7] and [7, 7].

Yes, the answer is correct.
Score: 1

Accepted Answers:
Paths [5, 7] and [6, 7].

X

Assignment 4

The due date for submitting this assignment has passed.

Due on 2020-10-14, 23:59 IST.

Assignment submitted on 2020-10-11, 23:10 IST

1) If method A uses a variable v shared with method B, where A writes to v and B reads from v, then, it is an example of which kind of coupling interface listed below? ***1 point***

- External device coupling.
- Parameter coupling.
- Interface coupling.
- Shared data coupling.

Yes, the answer is correct.
Score: 1
Accepted Answers:
Shared data coupling.

2) Choose an answer from the options below: A node in a callee function that defines a variable x and has a def-clear path from the node through a call site to a caller function is referred to as . . . . . ***1 point***

- Last-def of x.
- Def of x.
- First-use of x.
- Use of x.

Yes, the answer is correct.
Score: 1
Accepted Answers:
Last-def of x.

3) Which of the following best defines a test driver? ***1 point***

- It is a skeletal or special purpose implementation of a software module, used to develop or test a component that calls it.
- It is a software component that replaces a component that takes care of the control and/or the calling of a software component.

Yes, the answer is correct.
Score: 1
Accepted Answers:
It is a software component that replaces a component that takes care of the control and/or the calling of a software component.

4) State true or false: Both top-down and bottom-up integration testing work well with a hierarchical design. ***1 point***

- True.
- False.

Yes, the answer is correct.
Score: 1
Accepted Answers:
True.

5) State true or false: Control flow graphs are finite state machines representing code. ***1 point***

- True.
- False.

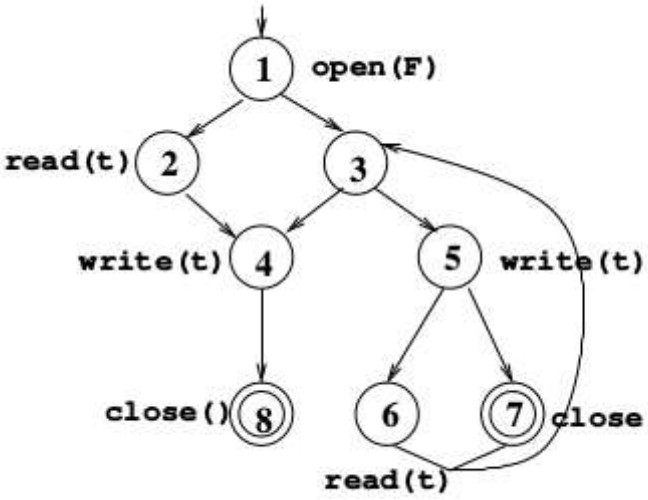
Yes, the answer is correct.
Score: 1
Accepted Answers:
False.

6) Which of the following best describes pre-conditions in finite state machines? ***1 point***

- 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.

Consider the graph representing method calls for a class **`FileADT`** given below. The methods used are **`open(F)`**, **`read(t)`**, **`write(t)`** and **`close()`**, where **`F`** is a file and **`t`** is a text pattern.



Answer the following questions related to sequencing constraints on the graph for the given methods.

7) Consider a sequencing constraint given by “Each time a file is open, a read or write should be called before it is closed”. Does the given graph satisfy this sequencing constraint? ***1 point***

- Yes.
- No.

Yes, the answer is correct.
Score: 1
Accepted Answers:
Yes.

8) Consider a sequencing constraint given by “A write should be executed before every close”. Does the given graph satisfy this sequencing constraint? ***1 point***

- Yes.
- No.

Yes, the answer is correct.
Score: 1
Accepted Answers:
Yes.

9) Which of the following statements are correct with respect to the sequencing constraints on the methods given by the above graph? ***1 point***

- The paths [1, 3, 4, 8] and [1, 3, 5, 7] violate the sequencing constraint “A read should be executed before every write, to a file.”.
- Only the path [1, 3, 4, 8] violates the sequencing constraint “A read should be executed before every write, to a file”.

Yes, the answer is correct.
Score: 1
Accepted Answers:
The paths [1, 3, 4, 8] and [1, 3, 5, 7] violate the sequencing constraint “A read should be executed before every write, to a file.”.

10) State true or false: The given graph satisfies the sequencing con- straint “Every path from open to close has a write followed by a read, in order”. ***1 point***

- ○ True.
- ◉ False.

Yes, the answer is correct.
Score: 1

Accepted Answers:
False.

X

Assignment 5

The due date for submitting this assignment has passed.

Due on 2020-10-21, 23:59 IST.

Assignment submitted on 2020-10-14, 20:10 IST

1) State true or false: A clause is an expression that may or may not have logical connectives and also evaluates to a Boolean value. ***1 point***

- True.
- False.

Yes, the answer is correct.
Score: 1

Accepted Answers:
False.

2) Which of the following represents correct subsumption order among logic coverage criteria? In the options below, read → as "subsumes". ***1 point***

- Combinatorial coverage → General active clause coverage → Predicate coverage.
- Predicate coverage → Correlated active clause coverage.
- Combinatorial coverage → Correlated active clause coverage → Predicate coverage.
- General active clause coverage → General inactive clause covrage

Yes, the answer is correct.
Score: 1

Accepted Answers:
Combinatorial coverage → Correlated active clause coverage → Predicate coverage.

The following eight questions are based on the logical predicate $p = a \vee (b \wedge c)$. Truth table for the predicate is given below with rows numbered. T represents the Boolean value true and F represents the Boolean value false.

	a	b	c	p
1	T	T	T	T
2	T	T	F	T
3	T	F	T	T
4	T	F	F	T
5	F	T	T	T
6	F	T	F	F
7	F	F	T	F
8	F	F	F	F

Answer the following questions with reference to logical coverage criteria for this predicate and the given truth table.

3) Which of the following represents p_a , the conditions under which clause a determines p? ***1 point***

- $b \vee c$
- $b \wedge c$
- $\neg b \wedge \neg c$
- $\neg b \vee \neg c$

Yes, the answer is correct.
Score: 1
Accepted Answers:
$\neg b \vee \neg c$

4) Which of the following represents p_b , the conditions under which clause b determines p? ***1 point***

- $a \vee c$
- $a \wedge c$
- $\neg a \wedge c$
- $\neg a \vee \neg c$

Yes, the answer is correct.
Score: 1
Accepted Answers:
$\neg a \wedge c$

5) Which of the following represents p_c , the conditions under which clause c determines p? ***1 point***

- $a \vee b$

$a \wedge b$

$\neg a \wedge b$

$\neg a \vee \neg b$

Yes, the answer is correct.
Score: 1

Accepted Answers:
$\neg a \wedge b$

6) Which of the following represents GACC pairs for clause a? Note: Numbers below represent row numbers from the truth table. ***1 point***

{2, 3, 4} × {6, 7, 8}

{1, 3, 4} × {5, 6, 7}

Yes, the answer is correct.
Score: 1

Accepted Answers:
{2, 3, 4} × {6, 7, 8}

7) State true or false: There is only one GACC pair for clause b. ***1 point***

True

False

Yes, the answer is correct.
Score: 1

Accepted Answers:
True

8) State true or false: There is only one GACC pair for clause c and it is (5, 6). ***1 point***

True

False

Yes, the answer is correct.
Score: 1

Accepted Answers:
True

9) The set {(2, 6), (3, 7), (4, 8)} is the set of RACC pairs for which clause? ***1 point***

Clause a

Clause b

Clause c

Yes, the answer is correct.
Score: 1

Accepted Answers:
Clause a

10) State true or false: CACC pairs for clauses *b* and *c* are different from GACC pairs for these clauses ***1 point***

- ○ True
- ◉ False

Yes, the answer is correct.
Score: 1

Accepted Answers:
False

X

Assignment 6

The due date for submitting this assignment has passed.

Due on 2020-10-28, 23:59 IST.

Assignment submitted on 2020-10-27, 11:01 IST

1) 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. ***1 point***

- (•) Yes.
- ( ) No.

Yes, the answer is correct.
Score: 1
Accepted Answers:
Yes.

2) Where do logical predicates occur in finite state machines? ***1 point***

- ( ) 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.

Answer the following questions for the method **`twoPred()`** below. The method is called with two input parameters **`x`** and **`y`**. The variable **`z`** is internal to the method.

```
public String twoPred (int x, int y)
```

```
{
        boolean z;
        if (x < y)
                z = true;
        else
                z = false;
        if (z && x+y == 10)
                return "A";
        else
                return "B";
}
```

3) The second predicate contains the variable **z** and can be re-written in terms of **x** and **y**. Which of the following represents the re-written second predicate? ***1 point***

- `(True && (x+y == 10).`
- `((x<y) && (x+y == 10).`

Yes, the answer is correct.
Score: 1
Accepted Answers:
`((x<y) && (x+y == 10).`

4) State yes or no: Predicate coverage for the first predicate **will not** ensure predicate coverage for the second predicate. ***1 point***

- Yes.
- No.

Yes, the answer is correct.
Score: 1
Accepted Answers:
Yes.

5) How many test cases will be needed for clause coverage for the second predicate if we explicitly count the true and false values for each clause? ***1 point***

- Two test cases.
- Four test cases.

No, the answer is incorrect.
Score: 0
Accepted Answers:
Four test cases.

6) State true or false: The set of test cases $\{(x = 5, y = 3), (x = 4, y = 6), (x = 5, y = 6)\}$ will satisfy clause coverage for the second predicate. ***1 point***

- True.
- False.

Yes, the answer is correct.
Score: 1
Accepted Answers:
True.

7) State yes or no: The set of test cases $\{(x = 5, y = 3), (x = 4, y = 6), (x = 5, y = 6)\}$ will also satisfy predicate coverage for the ***1 point***

first and second predicates.

- (•) Yes.
- ( ) No.

Yes, the answer is correct.
Score: 1
Accepted Answers:
Yes.

8) How many test cases are needed for satisfying RACC for all the clauses for the second predicate? ***1 point***

- ( ) Two test cases.
- (•) Three test cases.
- ( ) Four test cases.
- ( ) Six test cases.

Yes, the answer is correct.
Score: 1
Accepted Answers:
Three test cases.

9) State true or false: The set of test cases $\{(x = 4, y = 6), (x = 6, y = 4), (x = 4, y = 5)\}$ satisfy RACC for the second predicate. ***1 point***

- (•) True.
- ( ) False.

Yes, the answer is correct.
Score: 1
Accepted Answers:
True.

10) State true or false: RICC has no feasible pairs of test cases for the second predicate to be true. ***1 point***

- (•) True.
- ( ) False.

Yes, the answer is correct.
Score: 1
Accepted Answers:
True.

X

Assignment 7

The due date for submitting this assignment has passed.

Due on 2020-11-04, 23:59 IST.

Assignment submitted on 2020-11-04, 21:53 IST

1) State true or false: In functional testing, decision tables handle multiple inputs by considering different combinations of equivalence classes, with conditions handling the combinations. ***1 point***

- (●) True.
- ( ) False.

Yes, the answer is correct.
Score: 1
Accepted Answers:
True.

2) 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? ***1 point***

- ( ) 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.

3) In equivalence class based testing, how does each partition help in testing? ***1 point***

- 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.

No, the answer is incorrect.
Score: 0
Accepted Answers:
When the program under test is run on any input from each partition, it will produce the same output.

4) Which of the following is a formula for calculating the number of test cases for t-wise coverage? In the options below, n is the number of partitions and B_i is number of blocks for each partition. ***1 point***

- $Max_{i=1}^{n} B_i$.
- $(Max_{i=1}^{n} B_i)^t$.

Yes, the answer is correct.
Score: 1
Accepted Answers:
$(Max_{i=1}^{n} B_i)^t$.

5) Which of the following represents a correct order of subsumption among coverage criteria for input space partitioning? In the options below, read → as "subsumes". ***1 point***

- Pair-wise coverage → Base choice coverage → Each choice coverage.
- Multiple base choice coverage → Base choice coverage → Each choice coverage.
- Each choice coverage → Base choice coverage → All combinations coverage.
- All combinations coverage → Base choise coverage → Pair-wise coverage.

Yes, the answer is correct.
Score: 1
Accepted Answers:
Multiple base choice coverage → Base choice coverage → Each choice coverage.

6) State true or false: Pair-wise coverage and T-wise coverage criteria consider the functionality and interfaces while considering combinations. ***1 point***

- True.
- False.

Yes, the answer is correct.
Score: 1
Accepted Answers:
False.

For the following four questions, consider a function called **`NextDate`** which takes as input a valid date in mm/dd/yyyy (month followed by date followed by year) format and computes the date of the next day. For example, given 06/14/1996, the **`NextDate`** function will return 06/15/1996 and when given 02/28/2019, the **`NextDate`** function will return 03/01/2019. Answer the following questions regarding input space partitioning test cases for the **`NextDate`** function.

7) What are the variables involved in the **`NextDate`** function input? ***1 point***

- 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.

8) Which of the following are valid partitions for day, as a part of the input to **`NextDate`** function? ***1 point***

- ( ) Only one partition: 1 ≤ day ≤ 31.
- ( ) Two partitions: (1) day > 1 and (2) 30 ≤ day ≤ 31.
- ( ) Three partitions: (1) 1 ≤ day ≤ 29, (2) day = 30 and (3) day = 31.
- (●) Four partitions: (1) 1 ≤ day ≤ 28, (2) day = 29, (3) day = 30 and (4) day = 31.

Yes, the answer is correct.
Score: 1
Accepted Answers:
Four partitions: (1) 1 ≤ day ≤ 28, (2) day = 29, (3) day = 30 and (4) day = 31.

9) State true or false: The partition ***1 point***

(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.

10) Is the partition: { Year is a common year, Year is a leap year, Year is 2000 }, a valid partition for year as a part of the input to the **`NextDate`** function? ***1 point***

- (●) Yes.
- ( ) No.

Yes, the answer is correct.
Score: 1
Accepted Answers:
Yes.

X

Assignment 8

The due date for submitting this assignment has passed.

Due on 2020-11-11, 23:59 IST.

Assignment submitted on 2020-11-11, 21:34 IST

1) Consider a regular expression $(a+b)^* \cdot c$. Which of the following are languages generated by the given regular expression? ***1 point***

- $\{ac, bc\}$
- $\{w|w$ is a word over $\{a, b\}^*$ ending with a $c\}$. (selected)
- $\{abc\}$.
- $\{ac\}$ or $\{bc\}$.

Yes, the answer is correct.
Score: 1
Accepted Answers:
$\{w|w$ *is a word over* $\{a, b\}^*$ *ending with a* $c\}$.

2) 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. ***1 point***

- True. (selected)
- False.

Yes, the answer is correct.
Score: 1
Accepted Answers:

True.

3) Given a mutamt m of a ground string P and a test case t, when is t said to kill m? ***1 point***

- Test case t is said to kill m if m cannot run on t.
- Test case t is said to kill m if the output produced by P and m are the same when t is run on them.
- Test case t is said to kill m if the output produced by P on t is different from the output produced by m on t.
- Test case t is said to kill m if the run of P on t is different from the run of m on t.

Yes, the answer is correct.
Score: 1
Accepted Answers:
Test case t is said to kill m if the output produced by P on t is different from the output produced by m on t.

4) 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? ***1 point***

- 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.

5) Which of the following special mutation operator indicates a failure as soon as it is reached in a program? ***1 point***

- `Bomb()` function.
- `FailOnZero()` function.

Yes, the answer is correct.
Score: 1
Accepted Answers:
***`Bomb()`** function.*

6) When is a mutant said to be a trivial mutant? ***1 point***

- 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.

7) While using mutation testing to test a program, how many mutation operators are applied in one step of the mutation testing process? **1 point**

- Usually a small number of mutation operators based on need.
- Usually only one mutation operator at a time.
- It is decided by the target mutation score.
- It depends on how many mutants can be killed.

Yes, the answer is correct.
Score: 1
Accepted Answers:
Usually only one mutation operator at a time.

8) State true or false: Strongly killing a mutant and weakly killing a mutant are the same in mutation testing applied to test a method. **1 point**

- True.
- False

Yes, the answer is correct.
Score: 1
Accepted Answers:
False

9) Which of the following is a list of graph covreage criteria that are subsumed by mutation testing? **1 point**

- Node and edge coverage only.
- Node, edge and prime path coverage only.
- Node, edge and all-defs coverage only.
- Node, edge and all-uses coverage only.

Yes, the answer is correct.
Score: 1
Accepted Answers:
Node, edge and all-defs coverage only.

10) State true or false: Mutation testing subsumes combinatorial logic coverage criterion. **1 point**

- True.
- False.

Yes, the answer is correct.
Score: 1
Accepted Answers:
False.

X

Assignment 9

The due date for submitting this assignment has passed.

Due on 2020-11-18, 23:59 IST.

Assignment submitted on 2020-11-18, 17:09 IST

1) State true or false: While applying mutation operators for integration testing, both the callee and the caller methods are considered. ***1 point***

- (●) True.
- ( ) False.

Yes, the answer is correct.
Score: 1
Accepted Answers:
True.

2) While applying the mutation operator that deletes a method call, how is the value returned by the deleted method passed to the caller method? ***1 point***

- ( ) 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.

3) When mutation testing is applied for inputs to programs, which of the following software artifacts are mutated? ***1 point***

- Inputs are mutated.
- The program or the ground string is mutated.

Yes, the answer is correct.
Score: 1
Accepted Answers:
Inputs are mutated.

4) State yes or no: Is there a notion of killing of a mutant while applying mutation testing to inputs? ***1 point***

- Yes.
- No.

Yes, the answer is correct.
Score: 1
Accepted Answers:
No.

5) How is overloading different from overriding in object oriented programming? ***1 point***

- 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.

6) Which of the access levels in Java allows access with the same class and within different class but same package? ***1 point***

- Public.
- Private
- Protected.
- Package.

Yes, the answer is correct.
Score: 1
Accepted Answers:
Package.

7) When the mutation operator of hiding variable deletion is applied, what does it cause in the ground string program? ***1 point***

- It removes references to the variable.
- It causes references to the variable to access the variable defined in the parent or ancestor.
- It causes references to the variable to access the variable defined in the child class.
- It hides the variable.

Yes, the answer is correct.
Score: 1
Accepted Answers:
It causes references to the variable to access the variable defined in the parent or ancestor.

8) 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. ***1 point***

- (•) True.
- ( ) False.

Yes, the answer is correct.
Score: 1
Accepted Answers:
True.

9) Which options below have the two kinds of variables associated with a class? ***1 point***

- (•) Instance and class variables.
- ( ) Public and private variables.

Yes, the answer is correct.
Score: 1
Accepted Answers:
Instance and class variables.

10) State true or false: XML inputs to a program cannot be mutated as XML language is very complicated. ***1 point***

- ( ) True.
- (•) False.

Yes, the answer is correct.
Score: 1
Accepted Answers:
False.

X

Assignment 10

The due date for submitting this assignment has passed.

Due on 2020-11-25, 23:59 IST.

Assignment submitted on 2020-11-24, 23:28 IST

1) What do the edges with dashed arrows between nodes at a level in a yo-yo graph represent? ***1 point***

- They depict the actual method calls that can be made if an object has the actual type of that level.
- They depict the method calls that cannot be made due to over- riding.

Yes, the answer is correct.
Score: 1
Accepted Answers:
They depict the method calls that cannot be made due to over- riding.

2) If a descendent class does not override any inherited method and there is no polymorphic behaviour, then which fault/anomaly does it represent? ***1 point***

- 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.

3) State true or false: In OO-applications, definitions and uses of variables can be indirect as we cannot determine which version of the methods will potentially execute. ***1 point***

- ○ True.
- ○ False.

Yes, the answer is correct.
Score: 1
Accepted Answers:
True.

4) Do the coverage criteria “All-Coupling-Sequences” and “All-Coupling- Defs-Uses” consider polymorphism? ***0 points***

- ○ These two criteria consider only inheritance and not polymorphism.
- ○ These two criteria also consider polymorphism.

Yes, the answer is correct.
Score: 0
Accepted Answers:
These two criteria also consider polymorphism.

5) What is the main goal in testing of static websites? ***1 point***

- ○ To check if all links lead to correct pages.
- ○ To check if there are any dead links.

Yes, the answer is correct.
Score: 1
Accepted Answers:
To check if there are any dead links.

6) Which of the following lists different kinds of client side testing for web applications? ***1 point***

- ○ 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.

7) Suppose a particular web application server produces the error message “Unrecognized input format” in response to a wrong text entered as a part of a HTML form input, what kind of server response will it be classified as? ***1 point***

- ○ Valid server response.
- ○ Invalid server response.
- ○ Server crash.
- ○ Data corruption in server.

Yes, the answer is correct.
Score: 1
Accepted Answers:
Valid server response.

8) Why are control flow graphs not suitable for web applications testing? ***1 point***

- ○ 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.

9) In web applications testing, what is the name for a variable that provides data to an atomic section? ***1 point***

- State variable.
- Atomic variable.
- Content variable.
- Server variable.

Yes, the answer is correct.
Score: 1
Accepted Answers:
Content variable.

10) 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? ***1 point***

- 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.

X

Assignment 11

The due date for submitting this assignment has passed.

Due on 2020-12-02, 23:59 IST.

Assignment submitted on 2020-12-01, 22:50 IST

1) Which of the following best defines symbolic testing? ***1 point***

- 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.

2) State true or false: Symbolic execution can be terminated if the program under execution reaches an exit statement or encounters an error. ***1 point***

- True.
- False.

Yes, the answer is correct.
Score: 1

Accepted Answers:
True.

3) Which of the following is a list of disadvantages of symbolic execution? ***1 point***

- 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.

4) State true or false: Symbolic testing can always detect non-terminating loops. ***1 point***

- True.
- False.

Yes, the answer is correct.
Score: 1
Accepted Answers:
False.

Consider the code fragment given below. Answer the following questions related to symbolic execution of the given code fragment.

```
0: int x, y;
1: if (x > y) {
2:       x = x + y;
3:       y = x - y;
4:       x = x - y;
5:       if (x - y > 0)
6:       assert(false);
         }
```

5) What does the code fragment do? ***1 point***

- It checks if **x** is greater than **y**.
- It checks if **y** is greater than **x**.
- It swaps the values of **x** and **y**.
- It swaps the values of **x** and **y** twice.

Yes, the answer is correct.
Score: 1
Accepted Answers:
*It swaps the values of **x** and **y**.*

6) How many nodes will be there in the symbolic execution tree of the above code fragment? ***1 point***

- 3 nodes.
- 4 nodes.
- 7 nodes.
- 8 nodes.

No, the answer is incorrect.
Score: 0

Accepted Answers:
8 nodes.

7) How many decision points are there in the code fragment? ***1 point***

- Two decision points.
- Three decision points.

Yes, the answer is correct.
Score: 1

Accepted Answers:
Two decision points.

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

- `x > y.`
- `x <= y.`

Yes, the answer is correct.
Score: 1

Accepted Answers:
x <= y.

9) What will be the path constraint to reach statement 6? ***1 point***

- `x > y && y - x > 0.`
- `x > y && y - x <= 0.`

Yes, the answer is correct.
Score: 1

Accepted Answers:
x > y && y - x > 0.

10) State yes or no: Is statement 6 reachable in the program fragment? ***1 point***

- Yes.
- No.

Yes, the answer is correct.
Score: 1

Accepted Answers:
No.

X

Assignment 12

The due date for submitting this assignment has passed.

Due on 2020-12-09, 23:59 IST.

Assignment submitted on 2020-12-06, 18:13 IST

1) State true or false: Spike testing is a kind of stress testing. ***1 point***

- (•) True.
- ( ) False.

Yes, the answer is correct.
Score: 1
Accepted Answers:
True.

2) Testing for forward compatibility involves testing for which kind of the following features? ***1 point***

- ( ) 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.

No, the answer is incorrect.
Score: 0
Accepted Answers:
Testing to accept inputs for a latter version of the software itself.

3) Testing done to ensure that the system under test performs under peak/stress conditions is called as ***1 point***

- ( ) Performance testing.

- Load testing.
- Reliability testing.
- Stress testing.

Yes, the answer is correct.
Score: 1
Accepted Answers:
Stress testing.

4) Which of the following is a list of black box testing techniques? ***1 point***

- 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.

5) Which of the following best defines regression testing? ***1 point***

- Testing done on the entire software each time a part of it is modified.
- Testing done with modified and other relavant parts of software, whenever modifications are done.
- Testing done for 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 relavant parts of software, whenever modifications are done.

6) Which of the following best defines a polymorphic call set? ***1 point***

- 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.

7) Which of the following is a correct order of subsumption amongst coverage criteria for testing object-oriented applications? Read → below as “subsumes”. ***1 point***

- All poly coupling defs and uses → All poly defs.
- All poly coupling defs and uses → All poly classes.

Yes, the answer is correct.
Score: 1

Accepted Answers:
All poly coupling defs and uses → All poly classes.

8) Testing for mobile phones apps at middleware and device level is done using which of the following? ***1 point***

- 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.

9) Which of the following is a list of quality attributes that are tested using techniques for non-functional testing? ***1 point***

- Interoperability, functionality, security.
- Security, performance, reliability.
- Functionality, usability, scalability.
- Testability, performance, controllability.

Yes, the answer is correct.
Score: 1
Accepted Answers:
Security, performance, reliability.

10) State true or false: Regression testing is a white-box testing technique. ***1 point***

- True.
- False.

Yes, the answer is correct.
Score: 1
Accepted Answers:
False.