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Course
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About NPTEL

How does an
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course work?

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● Practice: Week
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Week 0 : Assignment 0

Your last recorded submission was on 2025-10-11, 00:10 IST

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

1) In the classical waterfall software development lifecycle, when is testing done?

1 point

- ☐ Along with coding.
- ☒ After complete coding is done.
- ☐ Coding and testing are repeated one after another.
- ☐ After complete coding and integration with system.

Yes, the answer is correct.

Score: 1

Accepted Answers:

After complete coding is done.

2) In Agile methodologies for software development, when is testing done?

1 point

- ☒ Testing is done along with coding by developers.
- ☐ Testing is done along with coding by testers.
- ☐ Testing is done after coding by developers.
- ☐ Testing is done after coding by testers.

Yes, the answer is correct.

Score: 1

Accepted Answers:

Testing is done along with coding by developers.

3) Which of the following best defines black box testing?

1 point

- ☐ Testing done on the entire software.
- ☐ Testing done to exercise parts of the software.
- ☒ Testing done based on requirements only.
- ☐ Testing done based on the structure of the software.

Yes, the answer is correct.

Score: 1

Accepted Answers:

Testing done based on requirements only.

4) What is regression testing?

1 point

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

5) State true or false: Testing can be entirely automated and done by using a tool without human intervention.

1 point

- ☐ True.
- ☒ False.

Yes, the answer is correct.

Score: 1

Accepted Answers:

False.

6) The term control flow graph, as used in testing, refers to which of the following?

1 point

- ☐ Graph representing the way functions or methods calling another function or method respectively.
- ☐ Graph representing the flow chart of the program.
- ☒ Graph representing all possible paths that might be traversed by a program.
- ☐ Graph representing the statements, decisions and loops in a program.

Yes, the answer is correct.

Score: 1

Accepted Answers:

Graph representing all possible paths that might be traversed by a program.

7) State true or false: Control flow graphs and data flow graphs are used in black box testing.

1 point

- ☐ True.
- ☒ False.

Yes, the answer is correct.

Score: 1

Accepted Answers:

False.

8) Which testing technique listed below uses relational and logical operators?

1 point

- ☐ Testing for functionality.
- ☐ Testing based on inputs and expected outputs.
- ☐ Testing for execution of decision statements in code.
- ☒ Testing for execution of decisions and loops in code.

Yes, the answer is correct.

Score: 1

Accepted Answers:

Testing for execution of decisions and loops in code.

9) State true or false: While testing web applications, both client side and server side testing is done.

1 point

- ☒ True.
- ☐ False.

Yes, the answer is correct.

Score: 1

Accepted Answers:

True.

10) Which of the following constitutes non-functional testing?

1 point

- ☒ Performance testing.
- ☐ Black-box testing.
- ☐ White-box testing.
- ☐ Integration testing.

Yes, the answer is correct.

Score: 1

Accepted Answers:

Performance testing.

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☒ Lecture 2 -
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☐ Lecture 3 -
Testing based
on Models and
Criteria

☐ Lecture 4 -
Automation -
JUnit as an
example

☐ Week 1
Feedback Form
:Software
Testing!!

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Week 1 : Assignment 1 (Non
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Your last recorded submission was on 2025-10-11, 00:12 IST

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

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 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.

3) 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 .

4) 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.

Check Answers and Submit

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How does an NPTEL online course work?

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Week 1

Week 2

Lecture 5 - Basics of Graphs: As used in testing

Lecture 6 - Structural Graph Coverage Criteria

Lecture 7 - Elementary Graph Algorithms

Lecture 8 - Elementary Graph Algorithms - Part 2

Lecture 9 - Algorithms: Structural Graph Coverage Criteria

Week 2 Feedback Form :Software Testing!!

Practice: Week 2 : Assignment 2 (Non Graded)

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Week 2 : Assignment 2 (Non Graded)

Your last recorded submission was on 2025-10-11, 00:13 IST

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

1) 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 .

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 $\{(1, 2), (1, 7), (2, 3), (2, 4), (3, 2), (4, 5), (4, 6), (5, 6), (6, 1)\}$.

2) 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.

3) 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].

No, the answer is incorrect.

Score: 0

Accepted Answers:

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

4) 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.

No, the answer is incorrect.

Score: 0

Accepted Answers:

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

5) 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].

No, the answer is incorrect.

Score: 0

Accepted Answers:

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

Check Answers and Submit

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Data Flow
Graph
Coverage
Criteria : Applied
to Test Code
- ☐ Lecture 16 -
Software Design
and Integration
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- ☐ Lecture 17 -
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Testing and
Graph
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- ☐ Lecture 18 -
Specification
Testing and
Graph
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- ☐ Lecture 19 -
Graph
Coverage and
Finite state
Machines
- ☐ Week 4
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Week 4 : Assignment 4 (Non
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Note : This assignment is only for practice purpose and it will not be counted towards the Final score

1) 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 .

No, the answer is incorrect.
Score: 0

Accepted Answers:
Last-def of x .

2) 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.

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

1 point

- ☒ True.
- ☐ False.

No, the answer is incorrect.
Score: 0

Accepted Answers:
False.

4) 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.

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☐ Logic Coverage
Criteria: Applied
to Test Code_1

☐ Logic Coverage
Criteria: Applied
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☐ Logic Coverage
Criteria: Issues
in Applying to
Test Code

☐ Logic Coverage
Criteria: Applied
to Test
Specifications

☐ Logic Coverage
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☐ Week 6
Feedback Form:
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☒ Practice: Week
6 : Assignment
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☐ Quiz: Week 6 :
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Week 6 : Assignment 6 (Non
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Your last recorded submission was on 2025-10-11, 00:17 IST

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

- 1) 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.

No, the answer is incorrect.
Score: 0

Accepted Answers:
They occur as guards in transitions of finite state machines.

- 2) How many test cases will be needed to achieve predicate coverage over a predicate with n clauses? 1 point
- ☐ Two.

☐ n.

☒ n + 1.

☐ 2n .

No, the answer is incorrect.
Score: 0

Accepted Answers:
Two.

- 3) 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.

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☐ Functional
Testing

☐ Input Space
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☐ Input Space
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☐ Input Space
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☐ Week 7
Feedback Form:
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☒ Practice: Week
7 : Assignment
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Week 7 : Assignment 7 (Non
Graded)

Your last recorded submission was on 2025-10-11, 00:18 IST

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

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.

No, the answer is incorrect.
Score: 0

Accepted Answers:
True.

2) 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.

3) 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.

No, the answer is incorrect.
Score: 0

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

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.

4) 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.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Date containing month, day and year.

5) 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.

Check Answers and Submit

Your score is: 1/5



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- ☐ Syntax-Based Testing
- ☐ Mutatioon Testing
- ☐ Mutation Testing for Programs
- ☐ Mutation Testing: Mutation Operators for Source Code
- ☐ Mutation Testing Vs. Graphs and Logic Based Testing

☒ Practice: Week 8 : Assignment 8 (Non Graded)

☒ Quiz: Week 8 : Assignment 8

- ☐ Week 8 Feedback Form :Software Testing!!

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Week 8 : Assignment 8 (Non Graded)

Your last recorded submission was on 2025-10-11, 00:18 IST

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

1) 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.
- ☒ False.

No, the answer is incorrect.
Score: 0

Accepted Answers:
True.

2) 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.

No, the answer is incorrect.
Score: 0

Accepted Answers:
They can replace both logical and relational operators.

3) 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*.

No, the answer is incorrect.
Score: 0

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

4) 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

5) 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.

Check Answers and Submit

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- ☐ Mutation Testing
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- ☐ Mutation testing
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- ☐ Software
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Week 9 : Assignment 9 (Non
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Your last recorded submission was on 2025-10-11, 00:20 IST

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

1) While applying the mutation operator that deletes a method call, how is the value returned **1 point** 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.

No, the answer is incorrect.
Score: 0

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

2) 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.

3) 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.

No, the answer is incorrect.
Score: 0

Accepted Answers:
False.

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☐ Testing of web
Applications and
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☐ Testing of web
Applications and
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☐ Testing of web
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☐ Testing of
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☐ Testing of
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Week 10 : Assignment 10 (Non
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Note : This assignment is only for practice purpose and it will not be counted towards the Final score

1) 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.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Inconsistent type use fault.

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

1 point

- ☐ These two criteria consider only inheritance and not polymorphism.
- ☒ These two criteria also consider polymorphism.
- ☐ Both All-Coupling-Sequences (ACS) and All-Coupling-Defs-and-Uses(ACDU) do not consider inheritance and polymorphism.
- ☐ Both All-Coupling-Sequences (ACS) All-Coupling-Defs-and-Uses(ACDU) consider inheritance and polymorphism.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Both All-Coupling-Sequences (ACS) and All-Coupling-Defs-and-Uses(ACDU) do not consider inheritance and polymorphism.

3) 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.

No, the answer is incorrect.
Score: 0

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

4) 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.

5) 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.

No, the answer is incorrect.
Score: 0

Accepted Answers:
It causes an operational transition.

Check Answers and Submit

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☐ Symbolic
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☐ Symbolic
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Automated
Random Testing

☐ DART: Directed
Automated
Random Testing
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☐ DART: Directed
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Week 11 : Assignment 11 (Non
Graded)

Your last recorded submission was on 2025-10-11, 00:21 IST

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

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) 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.

No, the answer is incorrect.

Score: 0

Accepted Answers:

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

3) 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.

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

1 point

- ☒ True.
- ☐ False.

No, the answer is incorrect.

Score: 0

Accepted Answers:

False.

Check Answers and Submit

Your score is: 2/4

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Course
outline

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course work?

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Week 12 : Assignment 12 (Non Graded)

Your last recorded submission was on 2025-10-11, 00:22 IST

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

1) 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.

Yes, the answer is correct.

Score: 1

Accepted Answers:

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

2) 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.

3) 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.

No, the answer is incorrect.

Score: 0

Accepted Answers:

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

4) 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.

No, the answer is incorrect.

Score: 0

Accepted Answers:

Emulators that are custom-built.

Check Answers and Submit

Your score is: 2/4