

Sample Exam

ISTQB Advanced Technical Test Analyst

Exam Prepared By



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#1. Which risk factors from the following set are typically the responsibility of the Technical Test Analyst?

1. Requirements that call for extremely complex code
 2. Previous version was poorly tested with many test escapes
 3. The need for an easy to learn interface for new users
 4. Potential financial, ecological or social losses or liability
 5. Multiple subsystem developers work in different time zones
 6. Whether Failure Mode Effects Analysis provides adequate coverage
- a. 1, 2, and 5
 - b. 2, 4, and 5
 - c. 1, 5, and 6
 - d. 2, 3, and 5

#2. In what ways should a Technical Test Analyst respond to risks that are identified after testing has started?

- a. Work closely with end-users to better define needs in areas identified as having additional risk
- b. Re-order test cases if test results have caused a reprioritization of risks
- c. Re-order test cases if numerous usability issues are noted during demonstrations
- d. Continue testing to the original risk analysis and address new risks when the scheduled testing is completed

#3. What is the primary weakness with condition coverage?

- a. It tests all the atomic conditions but does not necessarily test all the decision outcomes
- b. It tests all the decision outcomes but does not necessarily test all the atomic conditions
- c. It does not necessarily test all the decision outcomes or the atomic conditions
- d. It does not work if there is more than one atomic condition to be tested

#4. A remote subsystem developer has delivered a module that decides whether to sound an alarm based on three inputs (a HEAT sensor, a SMOKE sensor, and a user-triggered BUTTON). An alarm should sound if both the HEAT sensor and the SMOKE sensor are triggered, or if the alarm BUTTON is triggered. What is the minimum set of test combinations from the following sets of input values that achieve 100% Decision Condition coverage?

1. HEAT=true, SMOKE=true, BUTTON=false
 2. HEAT=true, SMOKE=true, BUTTON=true
 3. HEAT=true, SMOKE=false, BUTTON=false
 4. HEAT=false, SMOKE=false, BUTTON=true
 5. HEAT=false, SMOKE=false, BUTTON=false
 6. HEAT=false, SMOKE=true, BUTTON=false
- a. 3 and 6
 - b. 1 and 4
 - c. 2, 4, and 6
 - d. 2 and 5

#5. You are testing an automatic vehicle control system module for a new car model. The module decides whether to automatically apply the brakes and stop the car based on three inputs: a PROXIMITY sensor, a CLOSURE sensor, and a PEDESTRIAN alert (from another module). The brakes should automatically be applied if both the PROXIMITY sensor and a CLOSURE sensor are triggered, or if the PEDESTRIAN alert is triggered. The Test manager has determined that 100% Modified Condition/Decision Coverage (MC/DC) is required. What is the minimum set of test combinations from the following sets of input values that achieve this coverage?

1. PROXIMITY=true, CLOSURE=true, PEDESTRIAN=true
2. PROXIMITY=true, CLOSURE=true, PEDESTRIAN=false
3. PROXIMITY=true, CLOSURE=false, PEDESTRIAN=false
4. PROXIMITY=false, CLOSURE=true, PEDESTRIAN=true
5. PROXIMITY=false, CLOSURE=true, PEDESTRIAN=false
6. PROXIMITY=false, CLOSURE=false, PEDESTRIAN=false

- a. 1, 6
- b. 1, 4, 5
- c. 2, 3, 4
- d. 2, 3, 5, 6

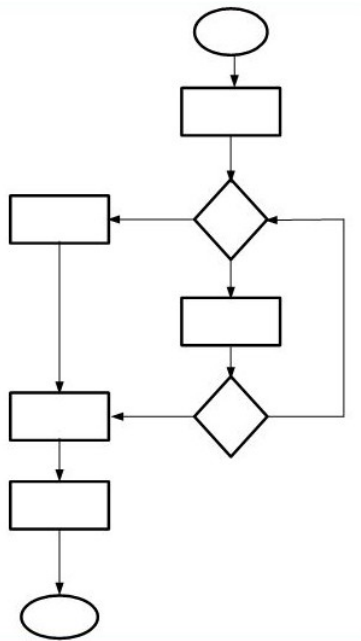
#6. You are working on a test for software that determines vaccination timing for puppies. You have the following condition that you need to test:

If the puppy is between 3 and 6 months old and has not had a rabies shot and is healthy, give the full dose rabies shot.

How many test cases are needed to achieve 100% multiple condition coverage with no short-circuiting?

- a. 1
- b. 3
- c. 6
- d. 8

#7. Consider the following flow diagram:



If loops are executed only once, how many paths need to be tested to perform realistic path testing per Beizer's recommendations?

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

#8. Your developers are working on a very complex system that uses the following:

- 10 different local O/S system calls
- 12 remote procedure calls to a supplier's database server
- Data from a client web server accessed through 15 different HTML GET commands
- Data from a government server via 32 SOAP access calls

Testing time is constrained by a contractual delivery date that cannot be changed, so complete testing of all possible combinations cannot be performed. What approach(es) are most appropriate for a Technical Test Analyst to use in testing these interfaces?

- a. Partition analysis with boundary value analysis
- b. Multiple condition coverage with outcome verification
- c. Path and data flow testing
- d. Combinatorial testing

#9. Your organization is implementing an enterprise service bus (ESB) to use between your CRM system and your e-commerce system. You are particularly concerned about issues that may occur if a component or interface is down. What type of testing should you do to find these types of defects?

- a. Security
- b. API
- c. Performance
- d. Usability

#10. As your first assignment as a Technical Test Analyst, you are reviewing the requirements for an automatic environmental control system for a new atomic power plant. The system decides whether to issue a warning tone to the staff, automatically apply valve and door-closure protocols (to prevent radiation leakage), or open emergency flood valves (to prevent core meltdown). The system's decisions are based on a set of temperature and radiation sensors placed throughout the power plant.

What level of testing is needed for this control system?

- a. Following guidance in IEC-61508, MC/DC is highly recommended
- b. Following guidance in DO-178B (in Europe, ED-12B), it must be tested to decision level coverage although MC/DC is optional
- c. Following guidance in IEC-61508, statement coverage is highly recommended and branch coverage recommended
- d. Following guidance in DO-178B (in Europe, ED-12B), it requires statement coverage at minimum but decision level coverage is recommended

#11. You are testing aircraft control software that is responsible for maintaining the aircraft in a level attitude. It has been determined that this software is rated as Hazardous, meaning that if it fails there could be a large negative impact on safety or performance. What type of coverage are you required to achieve according to DO-178B (ED-12B)?

- a. MC/DC coverage
- b. Condition coverage
- c. Decision coverage
- d. Statement coverage

#12. Analyze the follow code and determine the cyclomatic complexity.

```
Module Mini-Monster (X:int; Y:int; Z:int; T:boolean)
  If (T) Then
    While (X>1) Do
      While (Z < 1000) Do
        If (X < Y) Then
          If (Z > 100) Then
            Print (X)
          Else
            Print (Y)
          End If
        Z = Z-1
      End If
    Done
  Done
End-If
```

- a. Cyclomatic Complexity is 5
- b. Cyclomatic Complexity is 6
- c. Cyclomatic Complexity is 7
- d. Cyclomatic Complexity is 10

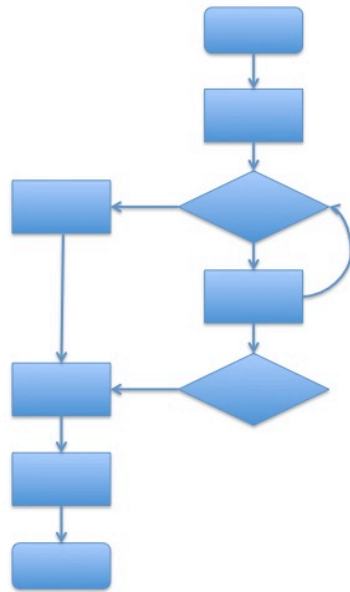
#13. Below is pseudo code for a sub-routine that your developer asked you to examine.

```
AMIRICH (Age:Int, Net-Worth:Int)
X, Y, Z: integer
BEGIN
    If (Net-Worth > 10) Then
        Print X
        Print Y
        Z = Measure-Moneybags(Age, Net-Worth)
    Else If (Net-Worth < 9)
        X = Age+21
        Y = 201
        Z = Age + Net-Worth
        If ((Net-Worth > 10) and (Y > 200)) Then
            Return (22)
        End If
        While (X > 0) Do
            Z = Z -1
        Done
    End If
    Return (Y)
END
```

While there may be other problems, what control flow anomalies are present?

- a. Because of structural errors, the program will always return a value of 22
- b. Variable Z is declared but never used in a control decision
- c. Mathematical calculations are done with Age and Net-Worth
- d. There is unreachable code and an infinite loop

#14. Consider the following control flow diagram.



Which of the following is a control flow issue with this diagram?

- a. There is an endless loop
- b. The complexity rating is over 5
- c. The second decision has only one outcome
- d. The operations are not in a logical sequence

#15. You have been conducting data flow analysis on a module of code to verify the proper lifecycle of variables. You have found the following lifecycles exist for the various variables in the code. Please note, each lifecycle is complete as shown.

- 1. d, u, k
- 2. u, u, u, k
- 3. k, u, u, d, u, k
- 4. d, u, u, u, k
- 5. d, d
- 6. d, k

Given these lifecycles, which of the following statements is true?

- a. 1, 2 and 4 are valid and maintainable lifecycles
- b. 2 and 3 are defects and must be fixed
- c. 5 and 6 are defects and must be fixed
- d. Only 1 is a valid and maintainable lifecycle

#16. One of the developers on your team has recently left the organization for a job that pays more. His code was reliable and stable and usually required little testing. Since he has left, the code has become extremely unreliable and any changes required to that part of the code require 2 – 3 times more effort than estimated. The development manager has asked what you suggest should be done to help improve the situation. Given this information, what should you tell him?

- a. Bring back the original developer, regardless of how much money he wants
- b. Conduct a detailed code review of all the code to identify defects
- c. Run a static analysis tool and use the output to direct maintainability activities
- d. Run a dynamic analysis tool to allow the developers to find, fix and test any changes to the code

#17. In a call graph, what is used to represent the communication between the program units?

- a. Edges
- b. Nodes
- c. Circles
- d. Tables

#18. You have been testing software that is experiencing intermittent crashes. These problems started when the developers introduced a new feature which changed the way sessions are handled to improve security. You have tried, but have not been able to find a way to reliably reproduce the crash, but it seems to happen at least once a week during functional testing. There are no obvious symptoms of the problem until the software crashes.

What should you do to identify the cause of the problem?

- a. Execute performance tests to see if the security change has affected the performance of the software
- b. Run a static analysis tool to ensure that the developers have not violated coding standards or introduced a new security vulnerability
- c. Run a dynamic analysis tool to identify any wild pointer issues that could be resulting in memory corruption
- d. Conduct cyclomatic complexity analysis and re-write any code modules that have a high complexity

#19. Your company is building a new mobile application to replace a legacy application that will allow users to measure their heart rate during preparation for the ATTA exam. If their heart rate exceeds a set number, an alarm sounds and a message is displayed telling the user to take a break. This information is reported back to a central server which tracks the frequency of alarm rates to determine if the exam is too hard.

The non-functional requirements currently state that the software must be “fast enough” and “very reliable” and “generally efficient”. Which of the following is the best approach to determining the non-functional testing requirements?

- a. Review the defect taxonomy for the existing application to determine the areas to be targeted for non-functional testing
- b. Talk with the stakeholders to identify the non-functional requirements in a testable form
- c. Work with the BA to define “fast enough”, “very reliable” and “generally efficient”
- d. Talk with the security specialists and operations people regarding their specific needs

#20. You are testing the software that analyzes input received from a machine that is used for conducting electrocardiograms (ECGs). Because the machines are quite expensive and not generally available, you will be doing your reliability testing on a simulator. This simulator has already been verified to be functionally correct and there are test automation scripts that have been written to work with the simulator. You will be able to use these scripts during your testing. Acceptable reliability levels are strictly controlled by the FDA (Food and Drug Administration of the US).

Given this information, what do you need to verify before you conduct the testing and forward the results for regulatory approval?

- a. Verify that the response time of the simulator is representative of the actual device
- b. Verify that the actual device is able to meet the reliability levels before conducting the testing on the simulator
- c. Verify that the developer has accurately documented the simulator and that you are working with the latest specifications
- d. Verify that the simulator has been approved for this use by the FDA

#21. You are working on a test plan for security testing for a system that will transmit personal medical information between insurance companies and doctors. Which of the following should be included in your test plan and built into your test approach?

1. The security testing should be scheduled primarily for the system test level
 2. The security testing should be scheduled for the unit, integration and system test levels
 3. The security testing should be scheduled to be conducted in production on a regular basis
 4. Static testing should be included in the approach
 5. Resource utilization should be benchmarked before security testing starts
 6. Dynamic testing should be included in the approach
 7. Maintainability goals in the software should be achieved prior to implementing security changes
 8. Performance testing should be conducted before and after security changes or fixes are made
 9. Planning for automating the security tests should occur prior to the approach being implemented
- a. 1, 3, 4, 5, 9
 - b. 2, 3, 4, 6, 8
 - c. 1, 2, 3, 4, 6
 - d. 2, 5, 6, 7, 8

#22. You are testing banking software for customers using mobile devices. One of the biggest concerns with this software is reliability. The bank has had a history of slow recovery when an error occurs. In fact, last year, the bank had an outage of one hour when a transaction was processed that exceeded the acceptable number of decimal points. What type of testing should you conduct to ensure that the system maintains high availability?

- a. Maturity tests
- b. Failover tests
- c. Backup and Restore testing
- d. Stress testing

#23. You are designing operational profiles for a mobile banking application. Which of the following would be a valid operational profile to use for this testing?

- a. A user logs into their account, checks their balance, makes a deposit, checks the balance again, logs out
- b. The memory footprint of the application cannot exceed 240 megabytes at any time during operation
- c. On average, a developer must be able to identify and resolve a defect within 10 hours
- d. The user must be able to complete a standard banking transaction within 5 minutes

#24. If you are seeking to minimize the long-term cost of ownership of a software application, what type of testing should be included in your test approach?

- a. Maintenance testing
- b. Efficiency testing
- c. Regression testing
- d. Maintainability testing

#25. You are the Technical Test Analyst on a team in the early planning stages for the testing of a major insurance company's enrollment website. Your Test Analyst just reminded you of problems of long wait times for new users that occurred with a similar system. You recall the news reports about that system stating that these major problems on the rollout were because at the design phase the back-end database system was incorrectly scaled. What sort of testing should you plan to help prevent such a disaster with this new system?

- a. Reliability testing, to ensure systems do not crash under high load
- b. Operability testing, to ensure operators can redistribute expected high loads
- c. Modifiability testing, to ensure components can be updated as needed
- d. Performance testing, to ensure all components can handle the expected load

#26. You are testing software that receives and transmits heart monitoring information for a pacemaker. This software must work within a confined amount of memory. If it exceeds the memory allotment, it will cause a catastrophic performance failure of the device. What type of non-functional testing should you perform to verify this will not be an issue?

- a. Load testing
- b. Stress testing
- c. Scalability testing
- d. Resource utilization testing

#27. Which of the following is an indicator that maintainability testing should be covered in the test approach during test planning?

- a. A high level of usability is required for a variety of user profiles
- b. Portability will be required across different platforms and components
- c. The product is expected to evolve and expand in functionality over the next two years
- d. Down time will result in critical impact to the business and potentially cause safety issues

#28. Which type of non-functional testing often requires the entire system to be implemented before effective testing can be done?

- a. Security
- b. Performance
- c. Maintainability
- d. Adaptability

#29. You are using exploratory testing of the situational awareness screen for operators of a large, system of systems, control module under a test charter. The test charter specifies looking for security anomalies by attempting to access system administrator functions while logged in with only operator privileges. The screen has many windows, which while configurable, are in their default positions. The window at the very bottom of the screen only displays four lines of text, and keeps scrolling up almost constantly. When you expand it, you see that the messages are critical warnings about failures in the linkage between two subsystems.

At this point, what type of defect have you found?

- a. Security
- b. Reliability
- c. Usability
- d. Scalability

#30. You are conducting installability testing. You have verified that the software can be installed per the instructions in the operator's manual and that the installation wizards are working correctly. You have verified that when a failure occurs during the installation, the software recovers gracefully and lets you continue with the installation. You have verified that a partial installation can be re-started at a later time and will work correctly. You have verified that the software checks for a valid environment before proceeding with the installation.

What is an important aspect of installability that you still need to test?

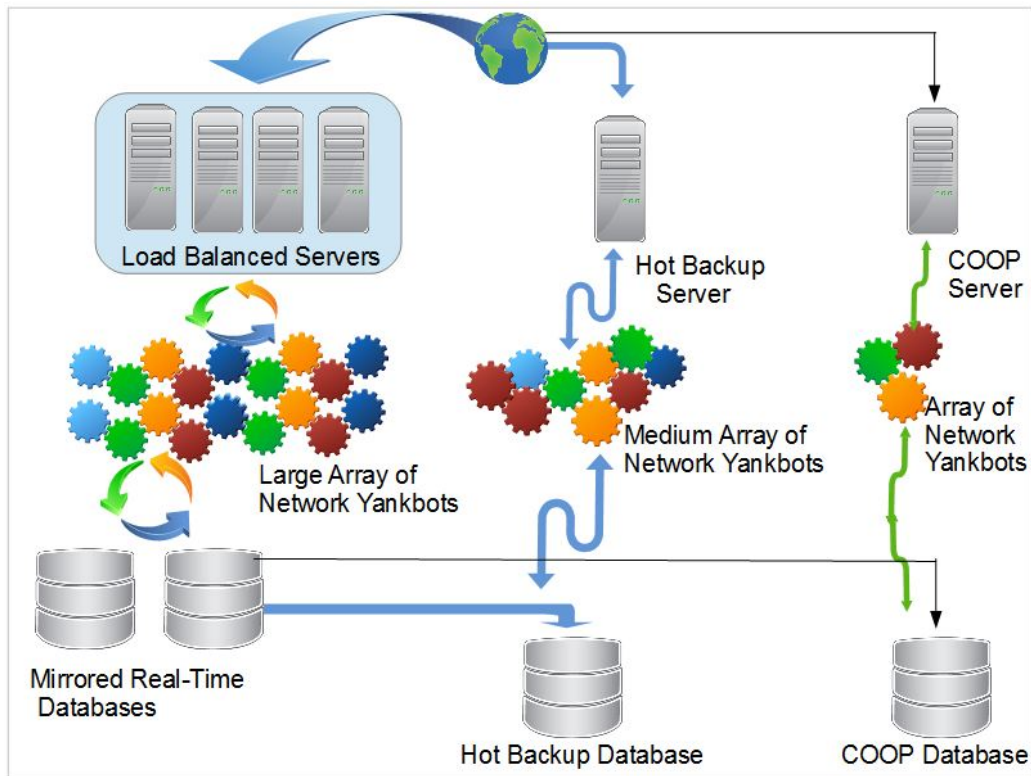
- a. That the software meets the performance targets after it has been installed
- b. That the installation wizard is secure and does not allow penetration by a hacker
- c. That the software can be uninstalled or downgraded without causing problems
- d. That the goals for analyzability, changeability and testability have been met

#31. When participating in a review of a product that will be integrated with other third party products in use, what is an important part of the Technical Test Analyst's preparation?

- a. Creating a review checklist for the usability of the product
- b. Reviewing the integration points and identifying the data and methods that will be tested
- c. Writing the operations manual that will be used to install the new software
- d. Working with the test manager to schedule adequate resources for the testing of the new product

#32. You have been tasked with performing an architectural review of a new system with the following description and design diagram.

A new, but heavily-funded Business Intelligence company is developing a World-Wide-Watcher. It will use sets of newly designed “Yankbots” with advanced artificial intelligence that cooperatively monitor the specific Internet sites and glean “opportunities.” They connect through a set of load-balanced servers over a high capacity connection. Yankbots can be clustered in arrays of any size. They store their data in a mirrored, real-time database system. At a hot backup site, the database is continuously replicated, along with a smaller array of Yankbots and a server. In case of a major disaster, there is a “Continuity of Operations” (COOP) site in a different part of the country. This also has its own continuously updated database, Yankbots, and server. See the diagram below:



Other than many questions about the Yankbots, what sorts of problems should be anticipated?

- Load balancing problems and problems with both database mirroring and replication
- Transaction caching due to the large number of possible paths data can traverse
- Anti-patterns resulting from defensive programming used to create the failover systems
- Process isolation errors and transaction concurrency problems from lazy database design
- World domination by the Yankbots

#33. You have been conducting performance testing for a business intelligence application. This application runs large reports that process huge amounts of data. These reports are usually run 1 – 3 times during the average work day. The data must be “near current” meaning that it cannot be more than 4 hours old. When the reports are running, users complain about slow performance and your performance testing has determined that the processing time for an “average” user transaction changes from 2 seconds to 28 seconds when the reports are running.

Given this information, you have decided to conduct an architecture review. Which of the following items should you expect to find either not implemented, or not implemented correctly?

- a. Load balancing across the servers
- b. Lazy instantiation
- c. Process isolation between OLTP and OLAP
- d. Transaction concurrency

#34. Consider the following procedure pseudocode to calculate an average:

```
AVES() {
  int i, n
  float sum, average
  float entries[101],
  PRINT "Enter the number of items to average: "
  READ n
  WHILE (n>100 OR n<0)
  {
    PRINT "Error! Entry should be in range of 1-100!"
    PRINT "Try Again: "
    READ n
  }
  i = 1
  WHILE (i < n) DO
  {
    PRINT "Enter Value: ", i
    READ entries[i]
    sum = sum + entries[i];
    i = i + 1
  }
  average=sum/n;
  PRINT "The Average Is ", average
}
```

Possible problems:

1. Code is not well-structured, consistent in style, and consistently formatted
2. Divisors not tested to prevent a divide by zero or noise
3. Loop termination conditions not obvious and invariably achievable
4. Storage use is not efficient

Which of the possible problems exist in this code?

- a. Problems 1 & 4
- b. Problems 2 & 3
- c. Problems 1 & 2
- d. Problems 2 & 4

#35. Consider the following section of pseudocode:

```
function getPassword() {
var x;
var y;
var z;
var passwordGood = false

// Get password from user, user is allowed 3 tries //
do until x = 3
  call promptUser (password)
  if passwordChecker (password)
    x = 3
    passwordGood = true
  else
    x = x + 1
    display "Password is not valid, try again"
  endif
  If passwordGood <> true
    display "You exceeded the number of tries to enter a password. Your account is now locked. Call
    customer service."
  endif
endloop
}
```

For this section of code, which of the following issues should be identified during a code review?

1. Variables have not been properly defined with meaningful names
 2. There are unused variables defined
 3. Divisors are not tested for zero
 4. Loop counters are not properly initialized
 5. There are endless loops
 6. There are statements within the loop that should be outside the loop
 7. Magic number constants are used in the code
- a. 1, 5
 - b. 3, 4, 7
 - c. 2, 3, 5, 6
 - d. 1, 2, 4, 6, 7

#36. What is one of the main concerns the Technical Test Analyst should have when configuring a static analysis tool to automatically record defects in the existing defect management tool?

- a. How will the tools interact and will manual intervention be possible?
- b. Will the tools work together "out of the box"?
- c. Is there a way to limit the defects automatically logged based on severity?
- d. How will the developers access the documented defects?

#37 What are the primary interface requirements for a test automation tool?

- a. Interfaces with the configuration management and build tools for the product source code
- b. Interfaces with the test management and defect management tools
- c. Interfaces with continuous integration tools
- d. Interfaces with static and dynamic analysis tools

#38. Which of the following is a true statement about data-driven test automation?

- a. It is the most maintainable form of test automation
- b. It uses external sources to provide the data and the expected results to the script
- c. It includes the data to be used within the actual script to speed up execution time
- d. It includes the action-words as well as the data in an external source that is read by the script

#39. When an automator is writing a test automation script, how should the script handle failures?

- a. It should continue on with the next test after the failure because that's how the software will work in production
- b. It should terminate when a failure is encountered
- c. It should execute a wait loop and retry the failed action
- d. It depends on the type of failure and where it occurs during execution

#40. You are testing a loyalty program which allows users to do the following:

- 1. Register
- 2. Login
- 3. Manage their account
 - 3a. Select security questions
 - 3b. Change password
 - 3c. Change contact details
- 4. Get deals
- 5. Print vouchers
- 6. Logout

Which of the following is the correct table to use for a keyword-driven test automation script to test item 3a?

a.

Action	Select Question
Select Security Questions	Mother's maiden name
Select Security Questions	First pet's name
Select Security Questions	Favorite movie
Select Security Questions	No selection

b.

Action	Select Question	Answer Question	Result
Select Security Questions	Mother's maiden name	Smith	Success
Select Security Questions	First pet's name	Fido	Success
Select Security Questions	Favorite movie	Princess Bride	Success
Select Security Questions	No selection	Smith	Error
Select Security Questions	Mother's maiden name	<null>	Error

c.

Action	Select Question	Answer Question	Result	Message Text
Login/Manage Account/Select Security Question	Mother's maiden name	Smith	Success	Thank you
Login/Manage Account/Select Security Question	First pet's name	Fido	Success	Thank you
Login/Manage Account/Select Security Question	Favorite movie	Princess Bride	Success	Thank you
Login/Manage Account/Select Security Question	No selection	Smith	Error	Question was not selected
Login/Manage Account/Select Security Question	Mother's maiden name	<null>	Error	No answer was entered

d.

Action	Select Question	Answer Question	Result	Message Text
Select Security Questions	Mother's maiden name	Smith	Success	Thank you
Select Security Questions	First pet's name	Fido	Success	Thank you
Select Security Questions	Favorite movie	Princess Bride	Success	Thank you
Select Security Questions	No selection	Smith	Error	Question was not selected
Select Security Questions	Mother's maiden name	<null>	Error	No answer was entered

#41. If you want to test the ability of the software to handle unexpected and incorrect inputs, which method should you use?

- a. Fault seeding
- b. Fault inducing
- c. Fault injection
- d. Fault resolution

#42. If you have been asked to conduct performance tests on a scaled down version of production, what is a likely problem you will encounter during this testing?

- a. The hardware and network bandwidth may be insufficient for the load you will generate
- b. The data quality will not be representative of real production data
- c. The number of virtual users you can generate will not be sufficient to simulate a real load
- d. The operational profiles of the virtual users will not be accurate

#43. Which of the following is a common use for a web-based testing tool?

- a. Performance testing
- b. Standards compliance testing
- c. Scalability testing
- d. Security testing

#44. Commercial MBT tools are primarily used to do what with the model?

- a. Create it
- b. Execute it
- c. Document it
- d. Test it

#45. If you are working with a tool that generates test objects for each created class, what type of tool are you using?

- a. An xUnit framework tool
- b. A debugging tool
- c. A build automation and continuous integration tool
- d. A continuous deployment tool