Department of Information Science and Engineering

Workbook

18IS62-Software Testing

Unit I- Basics of Software Testing 1.

Define the following terms: (BT Level-1)

a) Error

When people make mistakes while coding, we call these mistakes “bugs”. Errors tend to propagate; a requirements error may be magnified during design, and amplified still more during coding.

b) Fault

A fault is the result of an error. It is more precise to say that a fault is the representation of an error, where representation is the mode of expression, such as narrative text, data flow diagrams, hierarchy charts, source code, and so on.

c) Failure

A failure occurs when a faulty code executes.

d) Incident

An incident is the symptom(s) associated with a failure that alerts the user to the occurrence of failure.

2. Match the following: (BT Level-L2)

a. System Testing	1. Detailed Design
b. Integration Testing	2. Requirement Specification
c. Unit Testing	3. Black Box Testing
d. Specification Based Testing	4. White Box Testing
e. Code Based Testing	5. Preliminary design

ANSWERS

A-2

B-5

C-1

D-3

E-4

3. Match the following: (BT Level-L2)

a. Reliability	1. ease with which an application can be used.

b. Correctness 2. adherence to common set of conventions and assumptions
c. Completeness 3. time taken by application to perform the task.
d. Consistency 4. correct operation of an application and is always refers to artefact.
e. Usability 5. probability of failure free operation
d. Performance 6. availability of all the features listed in the requirements

ANSWERS

A-5
B-4
C-6
D-2
F-3

4. Match the following(L2)

a. Organizational Metric 1. defects in each phase
b. Project Metrics 2. Cyclomatic Complexity
c. Process Metric 3. schedule metric
d. Product Metric 4. ratio between actual effort and estimated effort
e. estimated man power 5. thousands of lines of code (KLOC)

Answers

A-5
B-4
C-1
D-2
E-3

3. State True or False; Justify your answer with 2-3 lines. (BT Level-2)

a) The process of Automation cannot be generalized.

True, automation has drawbacks such as it requires structured data and reading and interpreting image or graphic data is almost impossible.

b) Fault of Omission refers to which we enter wrong in the representation of something

True, Fault of omission refers to when we fail to enter correct information. It is very hard to detect.

c) Fault of Commission refers to something which we fail to enter correctly.

True, Refers to when we enter wrong information in the representation of something.

d) Software Testing can be parallel to Implementation.

True, Some of its advantages are Accelerated Execution, Increases Test Coverage, Breaks Through the Testing Bottleneck and fixes bugs earlier.

e) Tester can be a developer or vice versa.

True, when a tester has enough knowledge of development, and vise versa, the developer can outsource minor developmental work to the tester and vice versa.

4. Answer the following with 2-3 sentences:

a) What is the purpose of Testing the software? **(L1)**

The essence of software testing is to determine a set of test cases for the item to be tested. A test case is (or should be) a recognized work product. It is a method to check whether the actual software product matches expected requirements and to ensure that software product is defect free.

b) What is a Software Requirement Specification(SRS)?**(L1)**

A software requirement specification foundation for software engineering activities and is constructed when entire requirements are elicited and analyzed.

c) List the disadvantages of waterfall model. **(L1)**

High amounts of risk and uncertainty. Not a good model for complex and object-oriented projects. Poor model for long and ongoing projects. Not suitable for the projects where requirements are at a moderate to high risk of changing

d) List some of the testing tools already in use**.(L1)**

Selenium. Selenium is one of the oldest and most popular tools in test automation.
Katalon Studio
Silk Test
Squish
TestComplete
Ranorex
Appium
EggPlant

e) Write the significance of documentation.**(L2)**

Project documents can make project testing easy and systematic

It saves organization time as well as cost

You can deliver a quality product to the client within the specified time limits

It leads to client satisfaction

Understand the scope better

5. Fill in the blanks.(L1)

a. A tester or developer uses test document and the user uses user manual

b. Testing a program on all possible inputs is known as exhaustive testing.

c. Program is considered correct if it behaves as expected on each element of its input domain.

d. Set of all possible input to a program is known as input domain.

6. Differentiate the following: (BT Level-2)

a. Correctness Vs Reliability of a software

Correctness	Reliability
The degree to which a system is free from defects in its specialization, design and implementation.	The ability of a system to perform its requested functions under stated conditions whenever required.
A software is said to be correct if it is free from error and accurate in accordance with fact, truth or reason. Conforming to acknowledged standards of style, manners or behaviours.	A software that is said to be reliable if one can have confidence in it. Only then the software can be considered trustworthy.

b. Specification based Vs Code Based Testing

Specification based testing	Code based testing
Functional testing method	Structural testing method
Known as black box testing. Implementation is not known and	Known as white box testing. Content or implementation is known and used to identify test cases.

function of black box is understood completely in terms of inputs and outputs.	
Test case identification uses only information provided in specification of software.	Test case identification is done on the basis of how function is implemented. Uses source code for test case identification.

c. Black Box Vs White Box Testing

Black box testing	White box testing
It is a testing approach which is used to test the software without knowledge of the internal structure of the program or application.	It is a testing approach in which internal structure is known by the tester.
Implementation knowledge is not required.	Complete knowledge is required.
It is less exhaustive and time consuming.	Exhaustive and time consuming.
Update to automation test script is essential if you modify the app frequently.	Automated test cases are useless.

d. faults of commission Vs faults of omission

Fault of commission	Fault of omission
Refers to when we enter wrong information in the representation of something.	Refers to when we fail to enter correct information.

7. Think and answer the following questions(L3)

1. A defect which could have been removed during the initial stage is removed in a later stage. How does this affect the cost?

   If a defect is known at the initial stage then it should be removed during that stage/phase itself rather than at some later stage. It's a recorded fact that if a defect is delayed for later phases it proves more costly. The following figure shows how a defect is costly as

the phases move forward. A defect if identified and removed during the requirement and design phase is the most cost effective, while a defect removed during maintenance is 20 times costlier than during the requirement and design phases.

For instance, if a defect is identified during requirement and design we only need to change the documentation, but if identified during the maintenance phase we not only need to fix the defect, but also change our test plans, do regression testing, and change all documentation. This is why a defect should be identified/removed in earlier phases and the testing department should be involved right from the requirement phase and not after the execution phase.

2. How to ensure complete test coverage? **(L2)**

Create a comprehensive testing strategy. It should take into account the application's requirements as well as the testing methods you'll be employing.

Create a checklist for all of the testing activities. Based on your testing strategy, the next step is to create a list of actual tasks that need to be carried out. Take into account the different types of testing, both manual and automated, the size and experience level of your team, and the type of application you develop.

Prioritize critical areas of the application. When resources are scarce you need to favor a risk-based approach to testing. Favor areas of the application that are both critical and have a high probability of having problems.

Create a list of all requirements for the application. This will be invaluable when performing both product and requirements coverage.

Write down the risks inherent to the application. This is required to perform risk coverage.

Leverage test automation. That way, you'll reduce overall testing time, free professionals from doing repetitive, tedious, and error-prone activities, and be able to cover many more portions of the application.

3. List down the difference between Software quality Assurance and Software quality Control.

Software quality assurance	Software quality control
Aims to prevent the defect	Aims to identify and fix the defect

It is a method to manage quality-Verification	It is a method to verify the quality-Validation
It is a preventive technique	It is a corrective technique
It's main motive is to prevent defects in the system. It is a less time consuming activity	Its main motive is to identify defects or bugs in the system. It is a time consuming activity
In order to meet the customer requirements, it defines standards and methodologies.	It confirms that the standards are followed while working on the product.