1)

a)

i) A) Test Plan

ii) D) All of the above

iii) C)

iv) Test ~~Case~~ Incident Report

v) 100

200*0.5

b]

i] Steps in selecting and Deploying a tool:

The test tools are to be selected carefully because of the following reasons.

* Free tools are not well suitable

* Developing the test tools in house is time consuming process

* Test Suites sold by vendors are expensive

* Test Suite will not meet all the requirements

* Test Suite requires a strong training sessions

* Test Suites are not portable to all platforms

Thus, it is very important to select the test tools as per the following steps:

i] Gather and analyse the test suite requirements and add any additional requirements if any.

For example: Select a tools that meets most of the requirements.

ii] Analyse the experiences and select a tools from the previous sections.

iii] Gather information and experience from other organisations that have already used the test suite

iv] Prepare a checklist of questions to the vendors to get the clarification on cost, effort etc.

v] Check all the available test tools and give give higher priority with the one having its source code as open source.

vi] Select a tool that meets most of the requirements as provided and train the developers/testers to gain the skill to use the particular tool.

vii] Deploy the test tools along with the source code to check ~~wi~~ its effectiveness with the help of skilled professionals

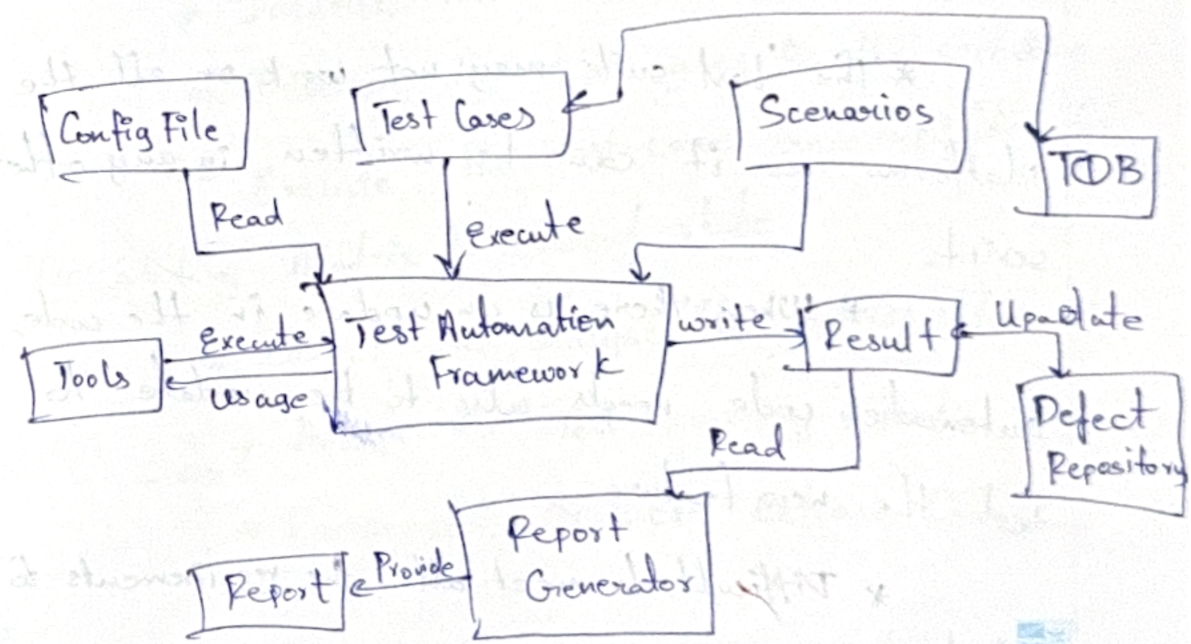
These are the steps involved in selecting and deploying a tools effectively in the process of software testing.

ii] Test Automation:

* The process of writing a software in order to test other software is called Test Automation.

* This process is used to automate the mundane tasks and avoid repetitive process of testing.

* The overall test automation framework is as follows:



Advantages:

* Increase Reliability.
* Improve Productivity.
* The testers/developers can focus more on doing creative tasks.
* Avoid repetition of testing over the software.
* The defects can be obtained as soon as the code is pushed to the repository.

Challenges:

* All the requirements to be tested is difficult in the case of Test Automation.
* The test suite may not work on all the platforms as it can be written in any other scripts.
* When there is an update in the code, the automation code needs also to be update to test the new feature.
* Difficult to meet all the requirements to be tested.
* More hardware and software resources to be used.

* The test cases should be checked and also be updated regularly.

c] Test Process:

* The test process defines the entire cycles from preparing a test case to release the product in production.
* The various steps involved in test process are:
  * Putting all together and baselining the Test Plan
  * Test Case Specification
  * Update the Traceability Matrix
  * Identify the possible candidates for automation
  * Develope the test cases for the software
  * Execute the test cases and update the Traçability Matrix to current state
  * Collect and analyse the metrics obtained
  * Prepare the Test Summary Report
  * Recommend Product Release Criteria

Putting all together and baseline in test Plan:

* The requirements for the testing and product are obtained and analyzed to make a better Test Plan.

* The Test Plan is the anchor for the execution, tracking and reporting of the entire testing.

* Thus the baselining of the Test Plan is done as it plays a crutial role to take the further process

Test Case Specification:

* Here the Specifications of the Test Cases are provided, this in turn includes:

* Test Case Name and standard
* Inputs required to the Test Case
* Expected Output from the Test Case
* The steps to be followed in the Test Case
* The Scenario in which the Test Case has to be executed

Update the Traceability Matrix:

* The Traceability Matrix is used to keep track of the testing progress to check its completion and status of the process.

* It consist of a series of Test Cases as the row headers and the functionalities to be tested as column headers and if they are tested it is updated on the matrix

Identify possible candidates for Automation.

* The part of the code that can be tested with the help of automation are identified.

* These parts are then tested with the help of the test automation framework.

Develop the Test Cases for the software:

* The Test Cases through which the software has to be tested is developed.

* It needs to make sure that all the requirements

are tested correctly

Execute the test Cases and update Traceability Matrix:

* The test cases are executed and the results obtained from the tests are stored for further analysis

* After the execution of the Test Case, the corresponding position in the Traceability Matrix is updated accordingly

Collect and analyse the metrics obtained:

* After the execution of the test cases, the results are collected and analysed to check the accuracy of the code.

* The metrics are obtained and they are used in the Test Summary report generation.

Prepare Test Summary Report:

* The Test Summary Report that is obtained by analysing all the test cases results and it provides the entire summary of the Test Cycle process.

Recommending Product Release Criteria:

* Then the Product is released as it is is testing thoroughly, if there are any other issues or defects it is identified and the corresponding software is updated before the release.

This is the complete test process steps and activities before Product Release.

Significance:

* Make sure the Product is not vulnerable

* The Product is tested thouroughly before its releases.

* The Test Cases used are validated to all the requirements

* The Test Summary reports provides a complete overview of the process.

F.P = totalCount * (0.65 + 0.01 * Fi)

a]

i] c)

ii] c)

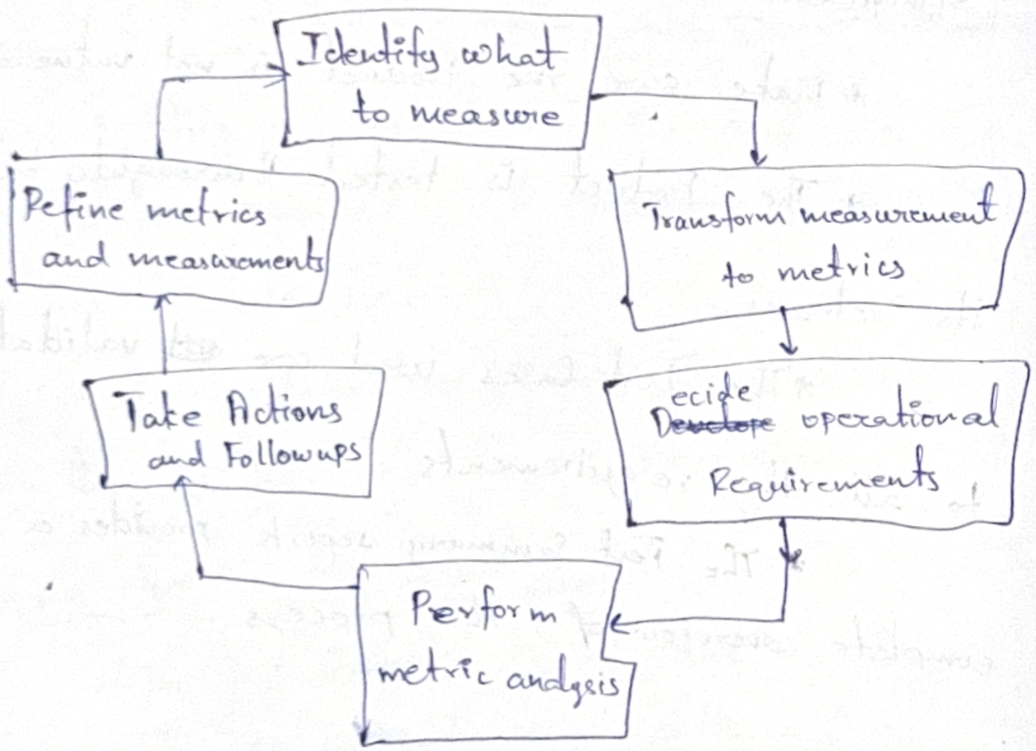
iii] D)

iv] ~~Quality~~ Productivity metrics

v] Elapsed Time

b]

ii] Software Metrics Program:



* The software metrics program is used to analyse the metrics of the software that

is being developed.

* First the process of what needs to be measured has to done correctly.

* The measurement has to be done without too many overheads as it leads to several errors.

* Then the measurement is converted to the metrics for further analysis.

* The various operational requirements of the system are decided.

* The analysis is done on the metrics obtained

* Then the corresponding actions as per the analysis is taken to update the software.

* Then the metrics and the measurements obtained are redefined for further processing

This provides the complete process of the software metrics program.

9

i) Function Point Metrics:

The Function Point Metrics is calculated with the following formula:

$$F.P = \text{Total Count} * (0.65 + (0.01 * (\Sigma F_i)))$$

The total Count consist of the following information

* Number of external inputs: These are the inputs that are provided to the system for the processing of information

* Number of external outputs: These are the outputs that are obtained from the system and provided back to the user after processing

* Number of input inquiries: It is defined as the total online input given to the system for processing to obtain the online output.

* Number of interal logic files: These files are used to perform the processing of data and provide the result to the User.

* Number of external interface files: These are used to interface with the external devices for further processing:

Division	Count	Simple	Average	Complex	Total Count
Number of external inputs	3	1	2	3	9
Number of external ouputs	2	2	3	1	2
Number of input inquiry	2	1	2	2	4
Number of internal logic files	1	3	1	1	1
Number of external interface files	4	2	2	2	8
					24

Total Count = 24 (Complex)

$$F.P \Rightarrow \text{Total Count} * (0.65 + (0.01 * \Sigma F_i))$$

$$\Rightarrow 24 * (0.65 + (0.01 * 46))$$

$$\Rightarrow 24 * 0.65 + 0.46$$

$$\Rightarrow 24 * 1.11$$

$$F.P \Rightarrow 26.64$$

This is the process through which the project team evaluates function point metrics.

2]

b] Steps in software measurement process:

i] * The software measurement process is used to measure the software that is being used.

* It consist of steps like:

* Collecting and meeting the requirements: All the requirements of the software are to meet and thus they are measured.

* The technological expectation and the technique and tools used for the software is to be measured.

* The management aspects of the product is also to be measured.

* The Lines of code is used to measure the overall quality of the Product.

* The measurement process must not include too many overheads as it leads to error

* It is converted to the metrics for further analysis.