

Practical 1 : Design test cases for purchase order management based on system specifications .

* Test cases :

ID	Test Case	Steps	Expected	Actual	Outcome
01	Test if user is able to login.	Enter correct ID & Password.	User must be logged in.	User is logged in.	Pass.
02	Test if user is able to shop by category.	1) Click Home. 2) Click on left top to get options.	Shop by category scroll bar must show up.	Shop by category scroll bar is visible.	Pass.
03	Test if user is able to search item.	1) Click on Search. 2) Type item you want to search.	A list of items must be displayed.	A list of items is displayed.	Pass.
04	Test if user can filter the search list.	Click on 'All' and select the category from which you want.	Only that particular category item must show.	Only that particular category's item are shown.	Pass.
05	Test if user is able to view details about the item.	Click on item after searching it.	All item details must be available.	All item details are available.	Pass.

ID	Test Case	Steps.	Expected	Actual	Result
06	Test if user can get a variety of ways to pay	Click on payment details after clicking on item.	All the available options must be displayed.	All the available options are displayed.	Pass.
07	Test if user can view inventory.	1) Go to home page. 2) Click on 'Cart' option.	Inventory must be displayed.	Inventory is displayed.	Pass.
08	Test if user can change its address of delivery.	1) Go to Home. 2) Click on delivery details 3) Click on change address.	New address input option must be available.	New address input option is available.	Pass.
09	Test if user can view his coupon list.	1) Go to Home 2) Click on Coupons.	Available Coupons must be displayed.	Available Coupons are displayed.	Pass.
10	Test if user can logout	1) Goto Home 2) Click on logout on top left -	User must logout. and return to login page.	User is logged out and returns to login page.	Pass .

* Practical Related Questions :

1. What are the objectives of Software Testing ?

→ The objectives of Software Testing :

1. Finding defects which may get created by the programmer while developing the software.

2. Gaining confidence in customer and providing information about the level of quality.

3. To prevent defects.

4. To make sure that the end result meets the business and user requirements.

5. To ensure that it satisfies the BRS that is Business Requirement specification and SRS that is System Requirement specifications.

6. To gain the confidence of the customer by providing them a quality product.

2. How can we design the test cases from requirements?

→ Requirement based testing :

Requirement based testing is a testing approach in which test cases, conditions and data are derived from requirements. It includes functional test and non-functional attributes such as performance reliability or usability.

• Stages in requirement based testing :

1. Defining test completion criteria -

Testing is completed only when all the functional and non-functional testing is completed.

2. Design Test Cases -

A test case has five parameters, namely pre-condition, ID, inputs, expected and actual outcome.

3. Execute Tests -

Execute the test cases against the system and document the results.

4. Verify the test results :-

Verify if the expected and actual result match each other.

5. Verify test coverage -

Verify if the test covers both the functional and non-functional aspects of the requirement.

6. Track and manage defects -

Any defects detected during the testing process goes through the defect life cycle and are tracked to resolution. Defects statistics are maintained which will give us the overall status of the project.

3. Compare static and Dynamic testing.

→ Difference between Static & Dynamic Testing -

Static Testing	Dynamic Testing
1. Testing is done without execution of program.	1. Testing is done by executing the program.
2. Static Testing does Verification process.	2. Dynamic Testing does Validation process.
3. Static Testing is about prevention of defects.	3. Dynamic Testing is about finding and fixing defects.
4. Static Testing gives an assessment of code and document.	4. Dynamic Testing gives bugs in the software system.
5. Static Testing can be performed before compilation.	5. Dynamic Testing is performed after compilation.
6. Cost of finding and fixing defects is low.	6. Cost of finding and fixing defects is high.

★ Exercise :-

1. Identify the situation when to start and stop software testing.

→ • When to Start Testing -

An early start of testing reduces the cost and time to rework and produce error-free software that is delivered to client.

Software Development Life Cycle Testing can be started from requirement gathering phase and continued till deployment.

It also depends on the development model that is being used.

• When to Stop Testing -

It is difficult to determine when to stop testing, as testing is a never ending process and no one can claim that a software is fully tested.

1. Testing Deadlines .

2. Completion to test case execution.

3. Management decision .

3. In White Box Testing identify the parameters to verify.

→ Parameters for White Box Testing :

1. Internal security holes.

2. Broken or poorly structured paths in the coding process.

3. The flow of specific inputs through the code.

4. Expected outcome.

5. The functionality of conditional loops.

6. Testing of each statement, object and function on an individual basis.

Practical 2 : Design Test cases for Inventory Management System based on System Specifications .

★ Test Cases :

ID	Test Case	Steps	Expected	Actual	Result.
01	Test if user is able to login.	Enter correct ID and password	Login must be successful.	Login is successful.	Pass.
02	Test if user is able to add item to inventory.	1) Right click on product. 2) Select 'Add to Cart'.	Must display "Added to Cart".	Displays "Added to Cart".	Pass.
03	Test if user is able to view inventory.	1) Go to Home. 2) Click on 'Cart'.	Inventory must be displayed.	Inventory is displayed.	Pass.
04	Test if user is able to order item.	1) Right click on 'Item' 2) Click on 'order'.	Item must be successfully ordered.	Item is successfully ordered.	Pass.
05	Test if user is able to order all the items.	1) Click on top 'Inventory'. 2) Click on 'Order All'.	All the items must be ordered.	All the items are ordered.	Pass.

ID	Test Case	Steps	Expected	Actual	Result.
06	Test if user is able to remove an item from cart	1) Right click on item. 2) Click on remove item.	Item must be removed.	Item is removed.	Pass.
07	Test if user is able to change quantity	1) Click on item. 2) Click on quantity. 3) Increase or decrease or enter manually.	quantity must be changed.	item quantity is changed.	Pass.
08	Test if you can remove all items.	1) Click on cart 2) Click on 'Remove All'.	All Items must be removed.	All Items are removed.	Pass.
09	Test if user is able to share cart with other users.	1) Click on Cart 2) Click on Share 3) Search the user you want to share with.	Cart must be shared.	Cart is shared.	Pass.
10	Test if user is able to logout of account.	1) Click on logout on top right on Home	User must logout	User is logged out.	Pass.

* Practical Related Questions :

1. What are major system specifications of Inventory Management System?

→ Major System specifications of Inventory Management System are as follows :

(i) Customer Registration -

IMS provides customer registration and status information to the administrator to view their status. IMS provides automatic customer registration algorithms.

(ii) Product Management -

Easily track project information quickly produce reports for multiple sold products. Easy tracking of rewards and updating can be done. These requirements do not impose any constraints on the execution characteristics of the system. They are :

- 1) No. of Terminals - The software makes use of an underlying database that will reside at some system, front end to administrative PC.
- 2) No. of Users - The number of users can be extended to applications for almost all staff members of organization.

2. What are functions of Inventory Management System?

→ Functions of Inventory Management System are :

(i) Barcode Scanning :

Easily identify and track your products inventory management software integrates with barcode scanner for instant product identification & labelling.

(ii) Inventory optimization :

Maintain just the right amount of inventory for each product without over or understocking any item. It is specially useful if you deal in products that experience a seasonal rise and fall in demand.

(iii) Multi location Management :

Manage multiple warehouse and points of sale. All locations can be integrated within a single IMS.

(iv) Stock Return Handling :

Manage returns more effectively by reducing time to return through automation of entire process.

3. What is the significance of Inventory Management System as per Business needs?

→ The following is the significance of IMS as per Business perspective :

(i) Helps with forward planning -

Inventory Management is a major company asset that helps a company with tasks. Planning is a key task that helps a manufacturer stay within budget.

(ii) Increase customer service & satisfaction -

Good IMS means that when customers enquires about certain items a manufacturer will quickly be able to identify availability. This enables fast responsive time to queries and in return customers get a better impression of the business.

(iii) Increase Manufacturer efficiency -

Accurate inventory management can help increase a manufacturer's overall efficiency .

★ Exercise :

1. Generate the test case to validate suppliers contact details like Mobile no., e-mail.

→ Test case for info :

ID	Test Case	Steps.	Expected	Actual	Result
01	Test to check entered no. is valid or not.	1) Enter 10 digit number with initial 2 no. with (7 & 9) India .	'Valid no.' must be displayed.	'Validno?' is displayed.	Pass.
02	Test to check if entered no. belongs to user or not.	1) Enter valid no. 2) Enter OTP received on that no.	'Success -fully added no.'	'Success -fully added no.'	Pass.
03	Test to check entered email is valid or not.	Enter email id with format : [**@**. **]	'Valid Email' is displayed.	'Valid Email' is displayed.	Pass
04	Test to check if entered email belongs to user or not.	1) Enter valid mail. 2) Enter OTP sent to that email.	'Success in Validation' must be displayed.	'Success in Validation' is displayed.	Pass.

2. Generate test case to validate quantity for selected items/goods.

→ Test case :

ID	Test case.	Steps.	Expected	Actual	Result
01	Test if user can edit quantity of item.	1) Click on item. 2) Click on quantity. 3) Change quantity between 1 & 100.	Item quantity will be changed.	Item quantity is changed.	Pass.
02	Test if user is able to enter invalid quantity.	1) Open quantity. 2) Increase invalid quantity to 101.	"Invalid" must be displayed.	"Invalid" is displayed.	Pass.
03	Test if user is able to increment or decrement.	1) Click on (+) to increment by 1 or (-) to decrement by 1.	Item quantity will be changed accordingly.	Item quantity is changed accordingly.	Pass.
04	Test if user can enter any number manually and price gets changed along with quantity.	1) Open quantity. 2) Change quantity between 1 & 100. 3) Click enter to apply changes.	Price must be changed according to quantity.	Price is changed according to quantity.	Pass.

3. Generate test case created in question 1 by entering email address as "abc@pqrs" and mobile number as "123456780", note down the results.

→ Test case :

ID	Test case .	Steps .	Expected	Actual	Result
01	Test if user enters invalid Mobile no.	1) Enter '123456780' as mobile no.	'Enter Correct no.' must be displayed.	'Enter correct' is displayed.	Pass .
02	Test if user enter invalid email id.	Enter 'abc@pqrs' as email id.	'Invalid id' must be displayed.	'Invalid id' is displayed.	Pass .

As the criteria for a successful login/signup is 10 digit mobile no. with initial two no. as (7-9) and email id in format of [**@**.*], if user tries to enter anything other than this he will not be able to login/signup .

Result :

The System responded correctly or in the way which it was designed to . Hence the result is Pass .

4. Execute test cases created in question 2 by entering quantity above 100 and below 1, note down the result.

→ Test case :

ID	Test case.	Steps.	Expected	Actual	Result
01	Test if user enters quantity as less than 0 or greater than 100.	1) Open quantity option. 2) Enter any no. less than 0 or greater than 100.	'Invalid no.' must be displayed.	'Invalid no.' is displayed.	Pass.

Here, the criteria for a valid input is a non-decimal number between 1 & 100, (inclusive). So if the user tries to enter any thing else than this, system must not accept it.

Result :

As the user entered a negative no. or a number greater than 100, system did not accept it. Hence the result for this case would be Pass.

Practical 3 : Design Test Cases for calculator
to verify its functionality .

ID	Test case	Steps.	Expected	Actual	Result
01	Test if no. is selected on click .	Click on the no. / sign.	No. must be selected.	No. is selected	Pass.
02	Test if no. are added correctly.	1) Select a no. 2) Click on (+) 3) Select another no	Result must be correct	Result is correct	Pass.
03	Test if no. are subtracted -d correctly.	1) Select 10 2) Click on (-) 3) Select 5	Output must be 5	Output is 5.	Pass.
04	Test if no. are divided correctly	1) Select -4 2) Click on (x) 3) Select 2	Output must be -8	Output is -8	Pass.
05	Test if no. are subtrac -ted correctly	1) Select 4 2) Click on (÷) 3) Select 2	Output must be 2	Output is 2	Pass.
06	Test if user can delete a selected no.	1) Select a no. 2) Click on (del).	Number must be deleted	Number is deleted	Pass.

ID	Test Case.	Steps.	Expected	Actual	Result
07	Test if result is displayed successfully.	1) Select any no. 2) Select any sign. 3) Select any no.	Result must be displayed.	Result is displayed.	Pass.
08	Test if system display (e) while multiplication.	Multiply two 10 digit no.	Result should have a (e) with it.	Result have a (e) with it.	Pass.
09	Test if scientific calculations work.	1) Select (log) 2) Select any other no. 8	Result 0.90308 must be displayed.	Result 0.90308 is displayed.	Pass.
10	Test if trigo signs work.	1) Select (sin) 3) Select an angle (30)	Result 0.5 must be displayed.	Result 0.5 is displayed.	Pass.
11	Test if power to works .	1) Select a no. 6 2) Select (^) sign. 3) Select another no. 2	Result 36 must be displayed.	Result 36 is displayed.	Pass.

* Practical Related questions :

1. State key factors to be tested in black box testing.

→ The main focus of 'Black Box Testing' is on the functionality of a system as whole. This testing method can be used to each and every level of Software Testing.

• Unit Testing :

Unit Testing is testing of an individual software component or module.

• Integration Testing :

Testing of all integrated modules to verify that combined functionality after integration is termed as Integration Testing.

• System Testing :

It is a black box type testing that is based on overall requirement specifications and covers all the combined parts of system.

• Acceptance Testing :

It is performed by the user to check if it is functioning correctly according to his needs.

2. What are the sources of knowledge for Black Box testing ?

→ The following are the sources of knowledge for Black Box Testing :

1. Decision Table Testing -

It is a software testing technique used to test system behaviour for different input combinations. It is stored in a tabular form.

2. All pairs testing -

In computer science, all-pair testing or pairwise testing is a combinatorial method of software testing that, for each pair of input, tests all possible discrete combinations of those parameters.

3. Equivalence Partitioning -

It is a software testing technique that divides the input data of a software into partitions of equivalent data. In principle, test cases are designed to cover each partition atleast once .

4. Boundary Value Analysis -

It is a software testing technique in which test cases are designed to include representatives of boundary values in a range.

5. Use Case Testing -

It is a functional black box testing technique that helps testers to identify test scenarios that exercise the whole system on each transaction basis from start to finish.

3. State advantages and disadvantages for Black Box testing.

→ Advantages :

1. Well suited and efficient for large scale code segments.

2. Code access not required.

3. Testing is performed from user's point of view and not of designer's.

4. Test cases can be designed as soon as the specifications are complete.

Disadvantages :

1. Blind coverage, since the tester cannot target specific code segments or error prone areas.

2. Test cases are difficult to design.

3. Testing every possible input is not possible.

4. Inefficient testing as tester has inefficient knowledge about the system.

★ Exercise :

1. Generate test cases to perform all the arithmetic operations.

→ Test cases :

ID	Test Case	Steps	Expected	Actual	Result
01	Test if no. are added correctly.	1) Select 10. 2) Select (+). 3) Select 5	Result must be 15.	Result is 15.	Pass.
02	Test if no. are subtracted correctly.	1) Select 10. 2) select (-) 3) select 5	Result must be 5	Result is 5.	Pass.
03	Test if no. are multiplied correctly.	1) Select 10. 2) Select (*) 3) Select 5.	Result must be 50.	Result is 50.	Pass.
04	Test if no. are divided correctly.	1) Select 10 2) Select (\div) 3) Select 5.	Result must be 2.	Result is 2.	Pass.
05	Test if power to works.	1) Select 10 2) Select (^) 3) Select 2.	Result must be 100.	Result is 100.	Pass.

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2. Generate test case to perform any 4 scientific operations.

→ Test case :

ID	Test case.	Steps.	Expected	Actual	Result
01	Test if trigonometric sign (sin) works.	1) Select (sin) 2) Select an angle 30°	Result must be 0.5	Result is 0.5	Pass.
02	Test if trigonometric sign (cos) works.	1) Select (cos) 2) Select an angle 30°	Result must be 0.866	Result is 0.866	Pass.
03	Test if trigonometric sign (tan) works.	1) select (tan) 2) Select an angle 30°	Result must be 0.8	Result is 0.8	Pass.
04	Test if trigonometric sign (cot) works.	1) Select (cot) 2) Select an angle 30°	Result must be $\sqrt{3}$	Result is $\sqrt{3}$	Pass.
05	Test if trigonometric sign (cosec) works.	1) Select (cosec) 2) Select an angle 30°	Result must be 2	Result is 2	Pass.

3. Execute test case created in question 1 by entering following operations.

a. Perform addition of 2 positive, 2 negative numbers.

→ Test case :

ID	Test case .	Steps.	Expected	Actual	Result
O1	Test if user can add 2 positive and 2 negative no.	1) Select 10 and (+) and another 10. 2) Select (+) and in brackets add (-10) 3) Select (+) and in brackets (-10)	Result must be 0. $(10 + 10 + (-20))$ $(20 - 20)$	Result is 0.	Pass.

b. Perform subtraction of 2 negative and 1 positive numbers.

→ Test case :

ID	Test case	Steps	Expected	Actual	Result
01	Test if subtraction of multiple no. works.	1) Select (-) 2) Select 5 3) Select (-) 4) Select (-5) in bracket. 5) Select (-) 6) Select 5	Result must be $(-5 - (-5))$ $= -5$ $(-5 + 5)$ $= -5$ $(5 - 5)$.	Result is -5	Pass.

4. Execute above test case created in question 2 by entering following operations and verify results.

a. Calculate logarithm of 8 to base of 2.

→ Test case :

ID	Test case	Steps	Expected	Actual Result
01	Test if the (log) sign works.	I) Select ($\lg(8)$). 2) Select (\div) 3) Select ($\lg(2)$) [This will look like : $\lg(8) \div \lg(2)$]	Result must be 3	Result is 3

b. Calculate values of any 4 trigonometric functions having the same theta value.

→ Test Case :

ID	Test Case	Steps	Expected	Actual	Result
01	Test if trigo sign (sin) works	1) Select (sin) 2) Select an angle 0°	Result must be 0	Result is 0	Pass
02	Test if trigo sign (cos) works	1) Select (cos) 2) Select an angle 0°	Result must be 1	Result is 1	Pass
03	Test if trigo sign (tan) works	1) Select (tan) 2) Select an angle 0°	Result must be 0	Result is 0	Pass
04	Test if trigo sign (cot) works	1) Select (cot) 2) Select an angle 0°	Result must be NA	Result is NA	Pass
05	Test if trigo sign (cosec) works.	1) Select (cosec) 2) Select an angle 0°	Result must be NA	Result is NA	Pass

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