I

Name _____

Roll No. _____ Year 20____20____

Exam Seat No. _____

COMPUTER GROUP | SEMESTER - V | DIPLOMA IN ENGINEERING AND TECHNOLOGY

A LABORATORY MANUAL

FOR

SOFTWARE TESTING

(22518)

MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION, MUMBAI
(Autonomous) (ISO 9001 : 2015) (ISO / IEC 27001 : 2013)

VISION

To ensure that the Diploma level Technical Education constantly matches the latest requirements of technology and industry and includes the all-round personal development of students including social concerns and to become globally competitive, technology led organization.

MISSION

To provide high quality technical and managerial manpower, information and consultancy services to the industry and community to enable the industry and community to face the changing technological and environmental challenges.

QUALITY POLICY

We, at MSBTE are committed to offer the best in class academic services to the students and institutes to enhance the delight of industry and society. This will be achieved through continual improvement in management practices adopted in the process of curriculum design, development, implementation, evaluation and monitoring system along with adequate faculty development programmes.

CORE VALUES

MSBTE believes in the followings:

- Education industry produces live products.
- Market requirements do not wait for curriculum changes.
- Question paper is the reflector of academic standards of educational organization.
- Well designed curriculum needs effective implementation too.
- Competency based curriculum is the backbone of need based program.
- Technical skills do need support of life skills.
- Best teachers are the national assets.
- Effective teaching learning process is impossible without learning resources.

A Laboratory Manual

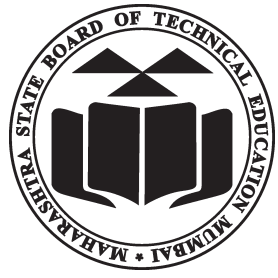
for

Software Testing

(22518)

Semester - V

(CO/CW/CM)



Maharashtra State
Board of Technical Education, Mumbai
(Autonomous) (ISO:9001:2015) (ISO/IEC 27001:2013)

Maharashtra State Board of Technical Education,
(Autonomous) (ISO:9001: 2015) (ISO/IEC 27001 : 2013)
4th Floor, Government Polytechnic Building, 49, Kherwadi,
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(Printed on May,2019)

Maharashtra State
Board of Technical Education
Certificate

This is to certify that Mr. / Ms. …….

Roll No…….of Fifth Semester of Diploma in

……..……

of Institute ……..

(Code ……..) has attained predefined practical outcomes (PROs) satisfactorily in course **Software Testing (22518)** for the academic year 20…….to 20…..... as prescribed in the curriculum.

Place: ……. Enrollment No.: ……

Date: …..... Exam Seat No.: …...…….....

Course Teacher **Head of the Department** **Principal**

Seal of the Institute

Preface

The primary focus of any engineering laboratory/field work in the technical education system is to develop the much needed industry relevant competencies and skills. With this in view, MSBTE embarked on this innovative 'I' Scheme curricula for engineering Diploma programmes with outcome-based education as the focus and accordingly, relatively large amount of time is allotted for the practical work. This displays the great importance of laboratory work making each teacher, instructor and student to realize that every minute of the laboratory time need to be effectively utilized to develop these outcomes, rather than doing other mundane activities. Therefore, for the successful implementation of this outcome-based curriculum, every practical has been designed to serve as a ***'vehicle'*** to develop this industry identified competency in every student. The practical skills are difficult to develop through 'chalk and duster' activity in the classroom situation. Accordingly, the 'I' scheme laboratory manual development team designed the practical's to ***focus*** on ***outcomes***, rather than the traditional age old practice of conducting practical's to 'verify the theory' (which may become a byproduct along the way).

This laboratory manual is designed to help all stakeholders, especially the students, teachers and instructors to develop in the student the pre-determined outcomes. It is expected from each student that at least a day in advance, they have to thoroughly read the concerned practical procedure that they will do the next day and understand minimum theoretical background associated with the practical. Every practical in this manual begins by identifying the competency, industry relevant skills, course outcomes and practical outcomes which serve as a key focal point for doing the practical. Students will then become aware about the skills they will achieve through procedure shown there and necessary precautions to be taken, which will help them to apply in solving real-world problems in their professional life.

This manual also provides guidelines to teachers and instructors to effectively facilitate student-centered lab activities through each practical exercise by arranging and managing necessary resources in order that the students follow the procedures and precautions systematically ensuring the achievement of outcomes in the students.

Today's world offers services to people for their ease and comfort. User's life style is becoming increasingly dependent on gadgets and even more on the software that controls the gadgets. Software testing broadly aims to certify not only the accuracy of the logic embedded in code but also adherence to functional requirements. Software testing is an important phase in the software-development cycle and software quality assurance. Well designed and tested software that is bug-free, which is the objective of the software developer and the expectation of the software tester and end user.

Although all care has been taken to check for mistakes in this laboratory manual, yet it is impossible to claim perfection especially as this is the first edition. Any such errors and suggestions for improvement can be brought to our notice and are highly welcome.

Programme Outcomes (POs) to be achieved through Practicals of this Course

Following programme outcomes are expected to be achieved significantly out of the ten programme outcomes and Information Technology programme specific outcomes through the practicals of the course on **Software Testing.**

PO 1. Basic knowledge: Apply knowledge of basic mathematics, science and basic engineering to solve the problems related to application of computers and communication services in storing, manipulating and transmitting data, often in the context of a business or other enterprise.

PO 2. Discipline knowledge: Apply Information Technology knowledge to solve broad-based Information Technology related problems.

PO 3. Experiments and practice: Plan to perform experiments, practices and to use the results to solve Information Technology related problems.

PO 4. Engineering tools: Apply appropriate Information Technology related techniques/ tools with an understanding of the limitations.

PO 5. The engineer and society: Assess societal, health, safety and legal issues and the consequent responsibilities relevant to practice in the field of Information technology.

PO 6. Environment and sustainability: Apply Information Technology related engineering solutions for sustainable development practices in environmental contexts.

PO 7. Ethics: Apply ethical principles for commitment to professional ethics, responsibilities and norms of practice in the field of Information Technology.

PO 8. Individual and team work: Function effectively as a leader and team member in diverse/ multidisciplinary teams.

PO 9.Communication: Communicate effectively in oral and written form.

PO 10. Life-long learning: Engage in independent and life-long learning along with the technological changes in the IT and allied industry.

Practical - Course Outcome Matrix

a. Apply various software testing methods.
b. Prepare test cases for different types and levels of testing.
c. Prepare test plan for an application.
d. Identify bugs to create defect report of given application.
e. Test software for performance measures using automated testing tools.

S. No.	Title of the Practical	CO a.	CO b.	CO c.	CO d.	CO e.
1	Identify system specification & design test cases for purchase order Management.	√	-	-	-	-
2	Identify system specification & design test cases for Inventory management	√	-	-	-	-
3	Design test cases for simple calculator application.(BB Testing)	√	-	-	-	-
4	Design test cases for railway reservation form	-	√	-	-	-
5	Design test cases for e-commerce (Flipkart, Amazon) login form	-	√	-	-	-
6	Design test cases for Web Pages Testing any Web Sites	-	√	-	-	-
7	Write program and design test cases for the following Control and decision making statement. 1) For… Loop 2) Switch…case 3) Do…While 4) If...else	-	√	-	-	-
8	Prepare test plan for an identified Mobile application	-	-	√	-	-
9	Design test plan and test cases for Notepad (MS Window based) Application.	-	-	√	-	-
10	Prepare defect report after executing test cases for library management system	-	-	-	√	-
11	Prepare defect report after executing test cases for Withdrawn of amount from ATM Machine.	-	-	-	√	-
12	Prepare defect report after executing test cases for any login form.	-	-	-	√	-
13	Design and run test cases for WordPad (MS Windows based). Using an Automated tool.	-	-	-	-	√
14	Design and run test cases for MS Word application using an Automation Tool	-	-	-	-	√
15	Project Assignment	√	√	√	√	-

List of Industry Relevant Skills

The following industry relevant skills of the competency "Apply types, levels and methods of software testing on applications." are expected to be developed in you by performing practicals of this laboratory manual.

1. Identify system with its specification and get familiar with the system.
2. Identify decision and control making statements and design code using the same statement.
3. Identify the mobile application with its specification and get familiar with the application.
4. Use the different software testing concepts.
5. Ability to write system specification of the systems.
6. Ability to design test case for given systems.

Brief Guidelines to Teachers

Hints regarding strategies to be used:-

1. Teacher shall explain prior concepts to the students before starting each experiment.
2. For practical's requiring tools to be used, teacher should provide the demonstration of the practical emphasizing the skills, which the student should achieve.
3. **Teacher shall encourage students to explore and use online simulators to get acquainted with application. Generate and execute test cases, Defect Report to have hands on experience of Software Testing concepts.**

   (One can use following link to generate, execute test cases and defect report for all practicals)

   www.softflairs.com/Testcases
4. Involve students in the activities during the conduct of each experiment.
5. Teachers should give opportunity to students for hands-on after the demonstration.
6. Assess the skill achievement of the students and COs of each unit.
7. Teacher is expected to share the skills and competencies to be developed in the students.
8. Teacher should ensure that the respective skills and competencies are developed in the students after the completion of the practical exercise.
9. Teacher may provide additional knowledge and skills to the students even though that may not be covered in the manual but are expected from the students by the industries.
10. Teacher may suggest the students to refer additional related literature of the reference books/websites/seminar proceedings etc.
11. During assessment teacher is expected to ask questions to the students to tap their knowledge and skill related to that practical.
12. **Micro project report is expected to contain Generated, executed Test cases and Defect report for opted problem statement.**

Instructions for Students

Student shall read the points given below for understanding the theoretical concepts and practical applications.

1. Students shall listen carefully the lecture given by teacher about importance of subject, learning structure, course outcomes.
2. Students shall organize the work in the group of two or three members and make a record of all observations.
3. Students shall understand the purpose of experiment and its practical implementation.
4. Students shall write the answers of the questions during practical.
5. Student should feel free to discuss any difficulty faced during the conduct of practical.
6. Students shall develop database designing and manipulation skills as expected by the industries.
7. Student shall attempt to develop related hands on skills and gain confidence.
8. Students shall refer technical magazines; websites related to the scope of the subjects and update their knowledge and skills.
9. Students shall develop self-learning techniques.
10. Students should develop habit to submit the write-ups on the scheduled dates and time.

Content Page

List of Practicals and Progressive Assessment Sheet

- To be transferred to Proforma of CIAAN-2017

Practical No. 1: Design test cases for purchase order management based on system specification.

I. Practical Significance

Testing is an important aspect of the software development life cycle. An early start to testing reduces the cost, time to rework and error free software that is delivered to the client. Test cases involve the set of steps, conditions and inputs which can be used while performing the testing tasks. This practical is useful to identify different systems specification such as purchase order management system and deign test cases for respective system effectively.

II. Relevant Program Outcomes (POs)

- **Basic knowledge:** Apply knowledge of basic mathematics, sciences and basic engineering to solve the broad-based computer engineering problem.
- **Discipline knowledge:** Apply computer engineering discipline - specific knowledge to solve core computer engineering related problems.
- **Experiments and practice:** Plan to perform experiments and practices to use the results to solve broad-based computer engineering problems.
- **Engineering tools:** Apply relevant computer technologies and tools with an understanding of the limitations.
- **Individual and team work:** Function effectively as a leader and team member in diverse/ multidisciplinary teams.
- **Communication:** Communicate effectively in oral and written form.
- **Life-long learning:** Engage in independent and life-long learning activities in the context of technological changes in the computer engineering field and allied industry.

III. Competency and Practical skills

This practical is expect to develop the following skills in you

Apply types, levels and methods of software testing on applications.

1. Identify system with its specification and get familiar with the system.
2. Use the different software testing concepts.
3. Ability to write system specification of the systems.
4. Ability to design test case for given systems.

IV. Relevant Course Outcome(s)

- Apply various software testing methods.

V. Practical Outcome (PrOs)

a) Identify system specification & design test cases for purchase order Management.

VI. Relevant Affective domain related Outcome(s)

1. Follow ethical practices.
2. Participate in team problem solving activities.
3. Prioritizes time effectively to meet the needs of the team and self.

VII. Minimum Theoretical Background

Testing is completely guided by software requirement specifications and design specifications, and supported by test strategy and test approach depending on assumptions and risks of development, testing and usages. A purchase order (PO) is a commercial document and first official offer issued by a buyer to a seller indicating types, quantities, and agreed prices for products or services. It is used to control the purchasing of products and services from external suppliers. Since the retailer and wholesalers will rely heavily on such applications one need to check and validate purchase order system thoroughly so that any defects that are leftover can be resolve in given period of time and near to perfect system can be delivered.

Procedure:

1. Select appropriate tool to generate test case(Like any text editor/web based tool)
2. Identify major specification/requirements for calculator's type i.e. scientific or standard to be tested
3. Identify required parameters such as test data, expected data etc.
4. Prepare and generate test case.
5. Verify test cases as per the specification by executing test data on any purchase order management system / application.

VIII. Additional Resources required

Sr. No.	Name of Resource	Specification	Quantity	Remarks
1	Hardware: Computer System	Computer (i3-i5 preferable), RAM minimum 2 GB and onwards, HDD free Space 1GB or More	As per batch size	For all Practical of Test Case Generation
2	Operating system	Windows 7 or latest/LINUX version 5.0 or later		
3	Software	https://www.testlodge.com/		

IX. Precautions

1. Note down the expected output for each test case carefully.
2. Select required test methodology and module(s).

X. Additional Resources used

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XI. Result (Output of the procedure)

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XII. Practical Related Questions

N*ote: Below given are few sample questions for reference. Teacher must design more such questions so as to ensure the achievement of identified CO.*

(Note: Use Point VIII to X and XIII to XV for all relevant practical exercise use blank pages provided or attach more pages if needed.)

1. What are the Objectives of software testing?
2. How can we design the test cases from requirements?
3. Compare Static and Dynamic testing.

(Space for answers)

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XIII. Exercise

Attempt Q1. and teacher shall allot Q. 2/Q.3 from the following:

(Note: Use Point VIII to X and XIII to XV for all relevant programming exercise use blank pages provided or attach more pages if needed.)

1. Identify the situation when to Start and Stop Software Testing.
2. Write the test case for a designed purchase order system.
3. In white box testing identify the parameters to verify?

(Space for answers)

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XIV. References / Suggestions for further Reading

1. https://www.softwaretestinghelp.com/beta-testing/
2. http: //spojtoolkit.com/TestCaseGenerator/
3. https://www.youtube.com/watch?v=BBmA5Qp6Ghk&vl=en

XV. Assessment Scheme

Performance Indicators		Weightage
Process related(15 Marks)		**30%**
1.	Tool Selection Ability	20%
2.	Follow ethical practices.	10%
Product related (35 Marks)		**70%**
3.	Verifying of System requirement Specification	20%
4.	Correctness in Use of Test Parameters	15%
5.	Generation and Execution of Test Case	15%
6.	Timely Submission of report	10%
7.	Answer to sample questions	10%
Total (50 Marks)		**100%**

List of Students /Team Members

1. ……..
2. ……..
3. ……..

Marks Obtained			Dated signature of Teacher
Process Related(15)	**Product Related(35)**	**Total(50)**	

Practical No. 2: Design Test Case for Inventory Management System based on System Specification.

I. Practical Significance

Inventory Management System is one of the most consumed systems for business in day to day life. There is majority of computerized system needs to be develop to assist such systems. This leads to rigorous testing of such module since business models are based on these systems. One needs to understand basic structure and specification of these types of system. Before one can test any application which supports Inventory Management System they need to understand and study the specifications. This practical will make learner to get acquainted with Major Specification of Inventory Management System and design Test Case for same.

II. Relevant Program Outcomes (POs)

- **Basic knowledge:** Apply knowledge of basic mathematics, sciences and basic engineering to solve the broad-based computer engineering problem.
- **Discipline knowledge:** Apply computer engineering discipline - specific knowledge to solve core computer engineering related problems.
- **Experiments and practice:** Plan to perform experiments and practices to use the results to solve broad-based computer engineering problems.
- **Engineering tools:** Apply relevant computer technologies and tools with an understanding of the limitations.
- **Life-long learning:** Engage in independent and life-long learning activities in the context of technological changes in the computer engineering field and allied industry.

III. Competency and Practical skills

This practical is expect to develop the following skills in you

Apply types, levels and methods of software testing on applications.

1. Identify system with its specification and get familiar with the system.
2. Use the different software testing concepts.
3. Ability to write system specification of the systems.
4. Ability to design test case for given systems.

IV. Relevant Course Outcome(s)

- Apply various software testing methods

V. Practical Outcome (PrOs)

a) Identify system specification & design test cases for Inventory management.

VI. Relevant Affective domain related Outcome(s)

1. Follow ethical practices.
2. Participate in team problem solving activities.
3. Prioritizes time effectively to meet the needs of the team and self.

VII. Minimum Theoretical Background

Inventory Management System is a centralized repository which contains information of all goods and materials that are required for efficient processing of items/goods that

are to be sold. Since these systems are computer application the test engineer(s) needs to test these systems in all aspects. These tests provide validation of system in all possible dimensions. Before one can proceed with testing it is desirable to understand functionality of Inventory management along with its requirements and major operations.

Procedure:

1. Select appropriate tool to generate test case(Like any text editor/web based tool)
2. Identify major specification/requirements for application/system to be tested
3. Identify testing methodology
4. Identify required parameters such as test data, expected data etc.
5. Prepare and generate test case for given inventory management system.
6. Verify test cases as per the specification.

VIII. Additional Resources required

Sr. No.	Name of Resource	Specification	Quantity	Remarks
1	Hardware: Computer System	Computer (i3-i5 preferable), RAM minimum 2 GB and onwards, HDD free Space 1GB or More	As per batch size	For all Practical of Test Case Generation
2	Operating system	Windows 7 or latest/LINUX version 5.0 or later		
3	Software	Any Word Processing tool such as Libre Office, Open Office http://www.inventoryadvice.com/simulator.html		

IX. Precautions

1. Note down the expected output for each test case carefully.
2. Select required test methodology and module(s).

X. Additional Resources used

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XI. Result (Output of the procedure)

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XII. Practical Related Questions

N***ote: Below given are few sample questions for reference. Teacher must design more such questions so as to ensure the achievement of identified CO.***

(Note: Use Point VIII to X and XIII to XV for all relevant practical exercise use blank pages provided or attach more pages if needed.)

1. What are major system specifications of Inventory Management System?
2. What are the functions of Inventory Management System?
3. Give the significance of Inventory Management System as per Business perspective.

(Space for answers)

XIII. Exercise

Attempt Q1. and teacher shall allot Q. 2/Q.3 from the following:

(Note: Use Point VIII to X and XIII to XV for all relevant programming exercise use blank pages provided or attach more pages if needed.)

1. Generate the test case to validate Supplier's contact details like Mobile number. E-mail address.
2. Generate test case to validate quantity for selected items / goods.
3. Execute above test case created in Question 1 by entering email address as "*abc@pqrs"* and mobile number as "*123456780"* note down the result.
4. Execute test case created in Question 2 by entering quantity above 100 and below 1; note down the result.

(Space for answers)

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XIV. References / Suggestions for further Reading

1. http://www.inventoryadvice.com/simulator.html
2. http: //spojtoolkit.com/TestCaseGenerator/

XV. Assessment Scheme

Performance Indicators		Weightage
Process related (15 Marks)		**30%**
1.	Tool Selection Ability	20%
2.	Follow ethical practices.	10%
Product related (35 Marks)		**70%**
3.	Verifying of System requirement Specification	20%
4.	Correctness in Use of Test Parameters	15%
5.	Generation and Execution of Test Case	15%
6.	Timely Submission of report	10%
7.	Answer to sample questions	10%
Total (50 Marks)		**100%**

List of Students /Team Members

1. ……..
2. ……..
3. ……..

Marks Obtained			Dated signature of Teacher
Process Related(15)	**Product Related(35)**	**Total(50)**	

Practical No. 3: Design Test Case for Calculator to verify its functionality.

I. Practical Significance

Calculator is most commonly used tool in any business application. Users tend to perform complex arithmetic operation with the help of calculator. Most of the computer operating system provides built in calculator which provides facility of calculator that contains various operations as well. Black box testing is one which specifies behavior of system hence most of the time it is called as *behavioral testing*. To perform behavioral testing/ black box testing test engineer doesn't need to have thorough knowledge of programming structure in which is used to develop the system. This practical will make student to get understand with major operations of Calculator and design Test Case for various operation performed by it.

II. Relevant Program Outcomes (POs)

- **Basic knowledge:** Apply knowledge of basic mathematics, sciences and basic engineering to solve the broad-based computer engineering problem.
- **Discipline knowledge:** Apply computer engineering discipline - specific knowledge to solve core computer engineering related problems.
- **Experiments and practice:** Plan to perform experiments and practices to use the results to solve broad-based computer engineering problems.
- **Engineering tools:** Apply relevant computer technologies and tools with an understanding of the limitations.
- **Life-long learning:** Engage in independent and life-long learning activities in the context of technological changes in the computer engineering field and allied industry.

III. Competency and Practical skills

This practical is expect to develop the following skills in you

Apply types, levels and methods of software testing on applications.

1. Identify system with its specification and get familiar with the system.
2. Use the different software testing concepts.
3. Ability to write system specification of the systems.
4. Ability to design test case for given systems.

IV. Relevant Course Outcome(s)

- Apply various software testing methods.

V. Practical Outcome (PrOs)

a) Design test cases for simple calculator application (BB Testing).

VI. Relevant Affective domain related Outcome(s)

1. Follow ethical practices.
2. Participate in team problem solving activities.
3. Prioritizes time effectively to meet the needs of the team and self.

VII. Minimum Theoretical Background

Calculator is one of the most familiar tools of almost all computer users. Everyone must have used calculator to perform certain arithmetic operation. To valid

functionality of calculator one can test calculator application using Black Box Testing. In Black box testing a use can verify the behavior of system that varies as per the input. One can also check boundaries of data and also validate the result at extreme condition i.e. precision of data. To perform Black box testing the test engineer doesn't need to have explicit knowledge of internal structure of application.

Procedure:

1. Select appropriate tool to generate test case(Like any text editor/web based tool)
2. Identify major specification/requirements for calculator's type i.e. scientific or standard to be tested
3. Identify required parameters such as test data, expected data etc.
4. Prepare and generate test case.
5. Verify test cases as per the specification by executing test data on any calculator application.

VIII. Additional Resources required

Sr. No.	Name of Resource	Specification	Quantity	Remarks
1	Hardware: Computer System	Computer (i3-i5 preferable), RAM minimum 2 GB and onwards, HDD free Space 1GB or More	As per batch size	For all Practical of Test Case Generation
2	Operating system	Windows 7 or latest/LINUX version 5.0 or later		
3	Software	Any Word Processing tool such as Libre Office, Open Office. Any calculator application		

IX. Precautions

1. Note down the expected output for each test case carefully.
2. Select required test methodology and module(s).

X. Additional Resources used

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XI. Result (Output of the procedure)

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XII. Practical Related Questions

N*ote: Below given are few sample questions for reference. Teacher must design more such questions so as to ensure the achievement of identified CO.*

(Note: Use Point VIII to X and XIII to XV for all relevant practical exercise use blank pages provided or attach more pages if needed.)

1. State key factors to be tested in black box testing.
2. What are the sources of knowledge for Black box testing?
3. State advantages and disadvantages of Black Box testing.

(Space for answers)

XIII. Exercise

Attempt Q1. and teacher shall allot Q. 2/Q.3 from the following:

(Note: Use Point VIII to X and XIII to XV for all relevant programming exercise use blank pages provided or attach more pages if needed.)

1. Generate the test case to perform all arithmetic operations.
2. Generate test case to perform any 4 scientific operations.
3. Execute above test case created in Question 1 by entering following operations and verify results.
   a. Perform addition of 2 Positive, 2 Negative numbers.
   b. Perform Subtraction of 2 negative and 1 positive numbers.
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.
   b. Calculate values of any 4 trigonometric functions having same theta values.

(Space for answers)

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XIV. References / Suggestions for further Reading

1. https://www.softwaretestinghelp.com/beta-testing/
2. http: //spojtoolkit.com/TestCaseGenerator/

XV. Assessment Scheme

Performance Indicators		Weightage
Process related (15 Marks)		**30%**
1.	Tool Selection Ability	20%
2.	Follow ethical practices.	10%
Product related (35 Marks)		**70%**
3.	Verifying of System requirement Specification	20%
4.	Correctness in Use of Test Parameters	15%
5.	Generation and Execution of Test Case	15%
6.	Timely Submission of report	10%
7.	Answer to sample questions	10%
Total (50 Marks)		**100%**

List of Students /Team Members

1. ……..
2. ……..
3. ……..

Marks Obtained			Dated signature of Teacher
Process Related(15)	**Product Related(35)**	**Total(50)**	

Practical No. 4: Test various functionality of railway reservation system.

I. Practical Significance

Railways are most common mode of transportation in India. Indian Railways manages world's fourth largest railway network by size with over 121,000KM having almost 2% of country's total population travelling in any given day of calendar. To make it efficient the Rail ministry had started online railway reservation system in way back 1986. This is very convenient system and hassle free as well considering utilization of technology and also reducing human efforts as far as Railway reservation concern. This practical will allow learner to understand major operations of Railway reservation System and design Test Case for various operation performed by it.

II. Relevant Program Outcomes (POs)

- **Basic knowledge:** Apply knowledge of basic mathematics, sciences and basic engineering to solve the broad-based computer engineering problem.
- **Discipline knowledge:** Apply computer engineering discipline - specific knowledge to solve core computer engineering related problems.
- **Experiments and practice:** Plan to perform experiments and practices to use the results to solve broad-based computer engineering problems.
- **Engineering tools:** Apply relevant computer technologies and tools with an understanding of the limitations.
- **Ethics:** Apply ethical principles for commitment to professional ethics, responsibilities and norms of the practice also in the field of Computer engineering.
- **Communication:** Communicate effectively in oral and written form.
- **Life-long learning:** Engage in independent and life-long learning activities in the context of technological changes in the computer engineering field and allied industry.

III. Competency and Practical skills

This practical is expect to develop the following skills in you

Apply types, levels and methods of software testing on applications.

1. Identify system with its specification and get familiar with the system.
2. Use the different software testing concepts.
3. Ability to write system specification of the systems.
4. Ability to design test case for given systems.

IV. Relevant Course Outcome(s)

- Prepare test cases for different types and levels of testing.

V. Practical Outcome (PrOs)

a) Design test cases for railway reservation form.

VI. Relevant Affective domain related Outcome(s)

1. Use different application for transportation purpose.
2. Participate in team problem solving activities.
3. Prioritizes time effectively to meet the needs of the team and self.

VII. Minimum Theoretical Background

Railway reservation system which allows user for make reservation of seats/berths before one can begin their journey. These systems allow to user to choose from various available trains and based on user's preference one can select and book a train. Payment can be made using online payment gateway. Though it looks very simple application for user to use, it holds its own complexity as far as operation and other aspect concerns. As a test engineer one need to test and validate all possible segment of such applications. Test engineer may end up using all types of testing on such application before making it available to stakeholders.

Procedure:

1. Select appropriate tool to generate test case(Like any text editor/web based tool)
2. Identify major specification/requirements for Railway reservation system to be tested.
3. Select Testing methodology(s) for Railway reservation system.
4. Identify required parameters such as test data, expected data etc.
5. Prepare and generate test case.
6. Verify test cases as per the specification by executing test data on any railway reservation application(s).

VIII. Additional Resources required

Sr. No.	Name of Resource	Specification	Quantity	Remarks
1	Hardware: Computer System	Computer (i3-i5 preferable), RAM minimum 2 GB and onwards, HDD free Space 1GB or More	As per batch size	For all Practical of Test Case Generation
2	Operating system	Windows 7 or latest/LINUX version 5.0 or later		
3	Software	Any Word Processing tool such as Libre Office, Open Office. Any railway reservation application		

IX. Precautions

1. Note down the expected output for each test case carefully.
2. Select required test methodology and module(s).

X. Additional Resources used

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XI. Result (Output of the procedure)

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XII. Practical Related Questions

N***ote: Below given are few sample questions for reference. Teacher must design more such questions so as to ensure the achievement of identified CO.***

(Note: Use Point VIII to X and XIII to XV for all relevant practical exercise use blank pages provided or attach more pages if needed.)

1. Give significance of testing in railway reservation system.
2. What are different test methodologies that shall be applied while testing railway reservation system? Justify.
3. Give the significance of system testing in railway reservation system.

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XIII. Exercise

Attempt Q1. and teacher shall allot Q. 2/Q.3 from the following:

(Note: Use Point VIII to X and XIII to XV for all relevant programming exercise use blank pages provided or attach more pages if needed.)

1. Prepare the test case to check availability of any train travelling from Mumbai to Delhi for next 5 days.
2. Generate test case to validate user email and mobile number on any railway reservation system.
3. Execute above test case created in Question 1 by entering following operations and verify results.
   a. Register yourself on any railway reservation portal by entering valid information. Verify and note down the email and message trails/OTP generated from this registration process.
   b. Check availability for next two days. Enter details for 2 travellers. Change age of any one passenger as 62. Verify and note down concession status. Click on book ticket by entering captcha as "*WRONGCAP*".
4. Execute above test case created in Question 2 by entering following operations and verify results.
   a. Enter any invalid mobile number of 7-8 digits.
   b. Enter your email without '@' character.

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XIV. References / Suggestions for further Reading

1. https://www.softwaretestinghelp.com/beta-testing/
2. http: //spojtoolkit.com/TestCaseGenerator/

XV. Assessment Scheme

Performance Indicators		Weightage
Process related(15 Marks)		**30%**
1.	Tool Selection Ability	20%
2.	Follow ethical practices.	10%
Product related (35 Marks)		**70%**
3.	Verifying of System requirement Specification	20%
4.	Correctness in Use of Test Parameters	15%
5.	Generation and Execution of Test Case	15%
6.	Timely Submission of report	10%
7.	Answer to sample questions	10%
Total (50 Marks)		**100%**

List of Students /Team Members

1. ……..
2. ……..
3. ……..

Marks Obtained			Dated signature of Teacher
Process Related(15)	**Product Related(35)**	**Total(50)**	

Practical No. 5: Validate login procedure for E-Commerce application.

I. Practical Significance

E-Commerce applications are no less than any boon to a person who is in fond of shopping. E-Commerce application is narrow down gap between the seller and buyer. This facilitate buyer to buy required commodity as per their requirements and also as per their time. Some applications also provide facility of flash sales to attract users. Considering the threat of various online activities it is pretty much essential to validate such E-Commerce application. In this practical a trainee will understand operations of login procedure for E-Commerce and design Test Case to validate its functionality.

II. Relevant Program Outcomes (POs)

- **Basic knowledge:** Apply knowledge of basic mathematics, sciences and basic engineering to solve the broad-based computer engineering problem.
- **Discipline knowledge:** Apply computer engineering discipline - specific knowledge to solve core computer engineering related problems.
- **Experiments and practice:** Plan to perform experiments and practices to use the results to solve broad-based computer engineering problems.
- **Engineering tools:** Apply relevant computer technologies and tools with an understanding of the limitations.
- **Ethics:** Apply ethical principles for commitment to professional ethics, responsibilities and norms of the practice also in the field of Computer engineering.
- **Communication:** Communicate effectively in oral and written form.
- **Life-long learning:** Engage in independent and life-long learning activities in the context of technological changes in the computer engineering field and allied industry.

III. Competency and Practical skills

This practical is expect to develop the following skills in you

Apply types, levels and methods of software testing on applications.

1. Identify system with its specification and get familiar with the system.
2. Use the different software testing concepts.
3. Ability to write system specification of the systems.
4. Ability to design test case for given systems.

IV. Relevant Course Outcome(s)

- Prepare test cases for different types and levels of testing.

V. Practical Outcome (PrOs)

a) Design test cases for e-commerce (Flipkart, Amazon) login form.

VI. Relevant Affective domain related Outcome(s)

1. Use different application for E-Commerce purpose.
2. Participate in team problem solving activities.
3. Prioritizes time effectively to meet the needs of the team and self.

VII. Minimum Theoretical Background

In modern era most of the people are familiar of various E-Commerce. This technology has given exclusive rise in trade which benefited all people associated with Commerce or trade. E-Commerce deals with almost all commodities that a user requires in its life span. Having said that it is very much essential to get acquainted with such application(s) and validate its operation. The first and foremost step to use such application(s) is to get registered and get logged-in on these applications. As a test engineer one needs to be very clinical with testing to avoid unauthorized access to an application developed for the cause. Common way to achieve this is to validate user's authentication at entry point only i.e. at login instance. The login module will segregate between users and allow only authorized user to proceed for further activity.

Procedure:

1. Select appropriate tool to generate test case(Like any text editor/web based tool)
2. Identify required E-Commerce system which is to be tested.
3. Identify required parameters such as test data, expected data etc.
4. Prepare and generate test case.
5. Verify test cases as per the specification by executing test data on any E-Commerce application(s).

VIII. Additional Resources required

Sr. No.	Name of Resource	Specification	Quantity	Remarks
1	Hardware: Computer System	Computer (i3-i5 preferable), RAM minimum 2 GB and onwards, HDD free Space 1GB or More	As per batch size	For all Practical of Test Case Generation
2	Operating system	Windows 7 or latest/LINUX version 5.0 or later		
3	Software	Any Word Processing tool such as Libre Office, Open Office. Any E-Commerce application		

IX. Precautions

1. Note down the expected output for each test case carefully.
2. Select required test methodology and module(s).

X. Additional Resources used

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XI. Result (Output of the procedure)

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XII. Practical Related Questions

N***ote: Below given are few sample questions for reference. Teacher must design more such questions so as to ensure the achievement of identified CO.***

(Note: Use Point VIII to X and XIII to XV for all relevant practical exercise use blank pages provided or attach more pages if needed.)

1. What are the security threats for E-Commerce System?
2. List different authentication protocols that can be used in providing security for E-Commerce System.
3. Describe various encryption techniques that can be used to provide storing login credentials.

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XIII. Exercise

Attempt Q1. and teacher shall allot Q. 2/Q.3 from the following:

(Note: Use Point VIII to X and XIII to XV for all relevant programming exercise use blank pages provided or attach more pages if needed.)

1. Prepare the test case to register yourself on any E-commerce website / application.
2. Generate test case to validate user login credentials on E-Commerce website.
3. Execute above test case created in Question 1 by entering following operations and verify results.
   a. Register yourself on any E-Commerce portal by entering valid information. Verify and note down the email and message trails/OTP generated from this registration process.

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XIV. References / Suggestions for further Reading

1. https://www.softwaretestinghelp.com/ecommerce-testing/
2. https://artoftesting.com/manualTesting/ecommerce.html

XV. Assessment Scheme

Performance Indicators		Weightage
Process related(15 Marks)		**30%**
1.	Tool Selection Ability	20%
2.	Follow ethical practices.	10%
Product related (35 Marks)		**70%**
3.	Verifying of System requirement Specification	20%
4.	Correctness in Use of Test Parameters	15%
5.	Generation and Execution of Test Case	15%
6.	Timely Submission of report	10%
7.	Answer to sample questions	10%
Total (50 Marks)		**100%**

List of Students /Team Members

1. ……..
2. ……..
3. ……..

Marks Obtained			Dated signature of Teacher
Process Related(15)	**Product Related(35)**	**Total(50)**	

Practical No. 6: Testing Functionality of Web page.

I. Practical Significance

Website is a collection of different webpages and web-services developed to serve one common goal. Web pages are interlinked to maintain navigation between different pages. In a website, web page can be termed as a single unit which performs specific operation. Before one can host website it is necessary to find all links are working as per requirement. In this practical a learner will able to validate operations for specified website generate require test case.

II. Relevant Program Outcomes (POs)

- **Discipline knowledge:** Apply computer engineering discipline - specific knowledge to solve core computer engineering related problems.
- **Experiments and practice:** Plan to perform experiments and practices to use the results to solve broad-based computer engineering problems.
- **Engineering tools:** Apply relevant computer technologies and tools with an understanding of the limitations.
- **Environment and sustainability:** Apply computer engineering solutions also for sustainable development practices in societal and environmental contexts and demonstrate the knowledge and need for sustainable development.
- **Individual and team work:** Function effectively as a leader and team member in diverse/ multidisciplinary teams.
- **Life-long learning:** Engage in independent and life-long learning activities in the context of technological changes in the computer engineering field and allied industry.

III. Competency and Practical skills

This practical is expect to develop the following skills in you

Apply types, levels and methods of software testing on applications.

1. Identify system with its specification and get familiar with the system.
2. Use the different software testing concepts.
3. Ability to write system specification of the systems.
4. Ability to design test case for given systems.

IV. Relevant Course Outcome(s)

- Prepare test cases for different types and levels of testing.

V. Practical Outcome (PrOs)

a) Design test cases for Web Pages Testing any Web Sites.

VI. Relevant Affective domain related Outcome(s)

1. Use different website for specified application.
2. Participate in team problem solving activities.
3. Prioritizes time effectively to meet the needs of the team and self.

VII. Minimum Theoretical Background

Website testing is a process to test website or any web app which is deployed on internet which is aiming to identify potential bugs. This testing is done before hosting

the website and making it available globally. All web based systems/ applications are required to be verified and validated in all aspect before it is hosted on internet. While performing website testing one must perform certain test like functionality testing, usability testing, interface testing, compatibility testing performance testing and most important is security testing. One of the crucial module which is require to be tested is linking between pages and also performance of the system in view of its availability.

Procedure:

1. Select appropriate tool to generate test case(Like any text editor/web based tool)
2. Identify required modules of the system which is to be tested.
3. Identify required parameters such as test data, expected data etc.
4. Prepare and generate test case.
5. Verify test cases as per the specification by executing test data on specified website / web application(s).

VIII. Additional Resources required

Sr. No.	Name of Resource	Specification	Quantity	Remarks
1	Hardware: Computer System	Computer (i3-i5 preferable), RAM minimum 2 GB and onwards, HDD free Space 1GB or More	As per batch size	For all Practical of Test Case Generation
2	Operating system	Windows 7 or latest/LINUX version 5.0 or later		
3	Software	Any Word Processing tool such as Libre Office, Open Office. Any web-application/ website		

IX. Precautions

1. Note down the expected output for each test case carefully.
2. Select required test methodology and module(s).

X. Additional Resources used

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XI. Result (Output of the procedure)

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XII. Practical Related Questions

N*ote: Below given are few sample questions for reference. Teacher must design more such questions so as to ensure the achievement of identified CO.*

(Note: Use Point VIII to X and XIII to XV for all relevant practical exercise use blank pages provided or attach more pages if needed.)

1. Give significance of performance and stress testing for web applications.
2. What is the necessity of configuration testing? Describe various configurations that are required to be considered while performing website testing.
3. Describe various security testings to be performed for web application. Give its importance.

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XIII. Exercise

Attempt Q1. and teacher shall allot Q. 2/Q.3 from the following:

(Note: Use Point VIII to X and XIII to XV for all relevant programming exercise use blank pages provided or attach more pages if needed.)

1. Prepare test case to test your college website for any 5 links available
2. Prepare test case for any website which sends OTP on your email address / mobile number.
3. Execute above test case created in Question 1 by performing appropriate operations and verify results.

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XIV. References / Suggestions for further Reading

1. https://www.softwaretestinghelp.com/web-application-testing/
2. https://geteasyqa.com/qa/test-website/

XV. Assessment Scheme

Performance Indicators		Weightage
Process related(15 Marks)		**30%**
1.	Tool Selection Ability	20%
2.	Follow ethical practices.	10%
Product related (35 Marks)		**70%**
3.	Verifying of System requirement Specification	20%
4.	Correctness in Use of Test Parameters	15%
5.	Generation and Execution of Test Case	15%
6.	Timely Submission of report	10%
7.	Answer to sample questions	10%
Total (50 Marks)		**100%**

List of Students /Team Members

1. ……..
2. ……..
3. ……..

Marks Obtained			Dated signature of Teacher
Process Related(15)	**Product Related(35)**	**Total(50)**	

Practical No. 7: Design Test Case for Control and decision making Statements.

I. Practical Significance

The fundamental assumption of code coverage testing is that to expose bugs, you should exercise as many paths through your code as possible. The more paths you exercise, the more likely your testing is to expose bugs. A path is a sequence of branches (decisions), or conditions (logical predicates). A path corresponds to a test case, or a set of inputs. Code coverage is a measure which describes the degree of which the source code of the program has been tested. It is one form of white box testing which finds the areas of the program not exercised by a set of test cases. This practical help the student to provides a capability to dictate the logical flow of execution and design Test Cases to check the control and decision making statements.

II. Relevant Program Outcomes (POs)

- **Basic knowledge:** Apply knowledge of basic mathematics, sciences and basic engineering to solve the broad-based computer engineering problem.
- **Discipline knowledge:** Apply computer engineering discipline - specific knowledge to solve core computer engineering related problems.
- **Experiments and practice:** Plan to perform experiments and practices to use the results to solve broad-based computer engineering problems.
- **Engineering tools:** Apply relevant computer technologies and tools with an understanding of the limitations.
- **Ethics:** Apply ethical principles for commitment to professional ethics, responsibilities
  and norms of the practice also in the field of computer engineering.
- **Individual and team work:** Function effectively as a leader and team member in diverse/ multidisciplinary teams.

III. Competency and Practical skills

This practical is expect to develop the following skills in you

Apply types, levels and methods of software testing on applications.

1. Identify decision and control making statements and design code using the same statement.
2. Use the different software testing concepts.
3. Ability to write system specification of the systems.
4. Ability to design test case for given systems.

IV. Relevant Course Outcome(s)

- Prepare test cases for different types and levels of testing.

V. Practical Outcome (PrOs)

a) Write program and design test cases for the following Control and decision making statement.

1) For…Loop 2) Switch…case 3) Do…While 4) If…else

VI. Relevant Affective domain related Outcome(s)

1. Follow ethical practices.

2. Participate in team problem solving activities.
3. Prioritizes time effectively to meet the needs of the team and self.

VII. Minimum Theoretical Background

Control Structure testing-

Control structure testing is a group of white-box testing methods. It is consist of following type-

a. Branch Testing
b. Data Flow Testing
c. Loop Testing

a. Branch Testing also called Decision Testing. Definition: "For every decision, each branch needs to be executed at least once." Obvious decision statements are if, for, while, switch. Multiple-condition testing requires that all true-false combinations of simple conditions be exercised at least once. Therefore, all statements, branches, and conditions are necessarily covered.

b. Loop Testing

Loops are fundamental to many algorithms and need thorough testing. The example of Loop testing is:

Create a set of tests that force the following situations:

i Simple Loops, where n is the maximum number of allowable passes through the loop.
ii Skip loop entirely
iii Only one pass through loop
iv Two passes through loop
v m passes through loop where m<n.
vi (n-1), n, and (n+1) passes through the loop.

VIII. Additional Resources required

Sr. No.	Name of Resource	Specification	Quantity	Remarks
1	Hardware: Computer System	Computer (i3-i5 preferable), RAM minimum 2 GB and onwards, HDD free Space 1GB or More	As per batch size	For all Practical of Test Case Generation
2	Operating system	Windows 7 or latest/LINUX version 5.0 or later		
3	Software	Any 2/3/4 Generation Language editor with compiler		

IX. Precautions

1. Note down the expected output for each test case carefully.
2. Select required test methodology and module(s).

X. Additional Resources used

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XI. Result (Output of the procedure)

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XII. Practical Related Questions

N***ote: Below given are few sample questions for reference. Teacher must design more such questions so as to ensure the achievement of identified CO.***

(Note: Use Point VIII to X and XIII to XV for all relevant practical exercise use blank pages provided or attach more pages if needed.)

1. State the different way to test the decision and Control statements.
2. For any decision statements what will be the Possible Outcomes while writing the test cases.
3. Can we test the relational operator? Validate the answer with justification.

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XIII. Exercise

Attempt Q1. and teacher shall allot Q. 2/Q.3 from the following:

(Note: Use Point VIII to X and XIII to XV for all relevant programming exercise use blank pages provided or attach more pages if needed.)

1. Generate the test case to check the program written for Even and Odd numbers.
2. Execute above test case in Question 1 by entering following inputs and verify results.
   Input- 4,7,2.5,8.1.
3. Generate test case to check the program written for printing the day of week.
4. Create the test cases for following algorithm and write the 'Expected Outcome' and ' Actual Outcome' in following table by executing the code-

```
declare Length as integer
declare Count as integer
READ Length;
READ Count;

WHILE (Count <= 6) LOOP

  IF (Length >= 100) THEN
    Length = Length - 2;
  ELSE
    Length = Count * Length;
  END IF

  Count = Count + 1;

  END;
  PRINT Length;
```

Test Cases

Case	Input Values Count Length	Expected Outcomes	Actual Outcomes
1	5 101		
2	5 99		
3	7 99		
4	0 0		

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XIV. References / Suggestions for further Reading

1. https://sqa.stackexchange.com/questions/10253/condition-decision-testing-with-loops
2. http://users.csc.calpoly.edu/~jdalbey/206/Assign/ControlTest.html

XV. Assessment Scheme

Performance Indicators		Weightage
Process related(15 Marks)		**30%**
1.	Tool Selection Ability	20%
2.	Follow ethical practices.	10%
Product related (35 Marks)		**70%**
3.	Verifying of System requirement Specification	20%
4.	Correctness in Use of Test Parameters	15%
5.	Generation and Execution of Test Case	15%
6.	Timely Submission of report	10%
7.	Answer to sample questions	10%
Total (50 Marks)		**100%**

List of Students /Team Members

1. ……..
2. ……..
3. ……..

Marks Obtained			Dated signature of Teacher
Process Related(15)	**Product Related(35)**	**Total(50)**	

Practical No. 8: Prepare Test plan for an identified Mobile Application

I. Practical Significance

A Test Plan is a document which describes a scope of testing, test strategy, objectives, effort, schedule and resources required. Its main purpose is to guide the whole testing process and used mostly by Project Managers or Tests Engineers. The scope of work is defined at the beginning of the testing process. A project team should clearly understand what features and functions to be tested and which ones are out of scope. This practical is useful for students to test any mobile application by preparing its test cases and test plan.

II. Relevant Program Outcomes (POs)

- **Discipline knowledge:** Apply computer engineering discipline - specific knowledge to solve core computer engineering related problems.
- **Engineering tools:** Apply relevant computer technologies and tools with an understanding of the limitations.
- **The engineer and society:** Assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to practice in field of computer engineering.
- **Ethics:** Apply ethical principles for commitment to professional ethics, responsibilities and norms of the practice also in the field of computer engineering.
- **Communication:** Communicate effectively in oral and written form.
- **Life-long learning:** Engage in independent and life-long learning activities in the context of technological changes in the computer engineering field and allied industry.

III. Competency and Practical skills

This practical is expect to develop the following skills in you

Apply types, levels and methods of software testing on applications.

1. Identify the mobile application with its specification and get familiar with the application.
2. Use the different software testing concepts.
3. Ability to write test case of the mobile application.
4. Ability to design test plan for given mobile application.

IV. Relevant Course Outcome(s)

- Prepare test plan for an application.

V. Practical Outcome (PrOs)

a) Prepare test plan for an identified Mobile application.

VI. Relevant Affective domain related Outcome(s)

1. Follow ethical practices.
2. Participate in team problem solving activities.
3. Prioritizes time effectively to meet the needs of the team and self.

VII. Minimum Theoretical Background

The test plan serves as a blueprint to conduct software testing activities as a defined process which is minutely monitored and controlled by the test manager. The scope of work is defined at the beginning of the testing process. A project team should clearly understand what features and functions to be tested and which ones are out of scope. To determine the scope of testing a Manager must take into consideration the project specification, budget and customer's requirements. Test Scenarios of Whatsapp mobile application-

Procedure:

1. Analyze the mobile application.
2. Define the Test Objectives.
3. Define the Test Criteria.
4. Resource Planning.
5. Plan Test Environment.
6. Schedule & Estimation.
7. Determine Test Deliverables

Or

1. Verify that on downloading whatsapp application, user can register using a new mobile number.
2. Verify that for a new mobile number user will get a verification code on his mobile and filling the same verifies the new user account.
3. Check the maximum number of incorrect attempts allowed while filling the verification code.
4. Verify that registering an existing mobile number for new user account registration is not allowed.
5. Verify that on successful registration all the contacts in user's contact directory get imported to whatsapp contact list.
6. Verify that user can set DP and status on whatsapp.
7. Verify that user can update existing DP and whatsapp status.
8. Verify that user can send message to any individual selected from his contact list.
9. Verify that 'Chats' window contains all the chat list with DP and name and last message preview of the other person with whome chat was initiated.
10. Verify that clicking a chat in the chat list opens a new window containing all the chats received and sent with the other person.
11. Verify that user can check the message delivered and read time for a message in the 'Message Info' section.
12. Verify that user can share or receive a contact with the other person.
13. Verify that user can create a group adding multiple person from his contact list.
14. Verify that user can send and receive message in group chats.
15. Verify that user can send and receive images, audio, video, emoticons in chat to individuals.
16. Verify that user can send and receive images, audio, video, emoticons in group chats.
17. Verify that user can send and receive chats in secondary languages available.
18. Verify that user can delete text, images, audio, video messages within a chat.
19. Verify that user can clear complete chat history in an individual or group chat.
20. Verify that user can archive chats in an individual or group chat.
21. Verify that user can block a user to prevent any message from getting received from the blocked contact.
22. Verify that user make whatsapp calls to the person in his contact list.

23. Verify that user can receive whatsapp calls from person in his contact list.
24. Verify that user can mark chats as favorite and access all chats marked as favorite from the 'Favorites' section.

Chat settings test scenario-

1. Verify that user can set chat wallpaper.
2. Verify that user set privacy settings like turning on/off last seen, online status, read receipts etc.
3. Verify that user can update notification settings like - notification sound, on/off, show preview for both group and individual chats.
4. Verify that user can take the complete chat backup of his chats.
5. Verify that user update his phone number that is used by whatsapp application.
6. Verify that user can disable/delete his whatsapp account.
7. Verify that user can check data usage by images, audio, video and documents in whatsapp chats.

VIII. Additional Resources required

Sr. No.	Name of Resource	Specification	Quantity	Remarks
1	Hardware: Computer System	Computer (i3-i5 preferable), RAM minimum 2 GB and onwards, HDD free Space 1GB or More	As per batch size	For all Practical of Test Case Generation
2	Operating system	Windows 7 or latest/LINUX version 5.0 or later		
3	Software	Any Word Processing tool such as Libre Office, Open Office. Any mobile application		

IX. Precautions

1. Note down the expected output for each test case carefully.
2. Select required test methodology and module(s).

X. Additional Resources used

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XI. Result (Output of the procedure)

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XII. Practical Related Questions

N*ote: Below given are few sample questions for reference. Teacher must design more such questions so as to ensure the achievement of identified CO.*

(Note: Use Point VIII to X and XIII to XV for all relevant practical exercise use blank pages provided or attach more pages if needed.)

1. On which basis the Test Approach is decided for any application?
2. Define the Test Management.
3. State the use of Test Case Specification. Enlist the Test Case Specification Identifiers.
4. Enlist the parameters that should be considered while preparing Test Summary Report.

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XIII. Exercise

Attempt Q1. and teacher shall allot Q. 2/Q.3 from the following:

(Note: Use Point VIII to X and XIII to XV for all relevant programming exercise use blank pages provided or attach more pages if needed.)

1. Prepare the test plan along with the test case to check the any chatting application.
2. Prepare the Test Summary Report for the application which is used in Question No.1.
3. Prepare the test plan for any food delivery application with test cases.

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XIV. References / Suggestions for further Reading

1. https://www.softwaretestinghelp.com
2. http: //spojtoolkit.com/TestCaseGenerator/

XV. Assessment Scheme

Performance Indicators		Weightage
Process related(15 Marks)		**30%**
1.	Tool Selection Ability	20%
2.	Follow ethical practices.	10%
Product related (35 Marks)		**70%**
3.	Verifying of System requirement Specification	20%
4.	Correctness in Use of Test Parameters	15%
5.	Generation and Execution of Test Case	15%
6.	Timely Submission of report	10%
7.	Answer to sample questions	10%
Total (50 Marks)		**100%**

List of Students /Team Members

1. ……..
2. ……..
3. ……..

Marks Obtained			Dated signature of Teacher
Process Related(15)	**Product Related(35)**	**Total(50)**	

Practical No. 9: Design Test plan and test cases for Notepad Application

I. Practical Significance

Test planning is the most important activity to ensure that there is initially a list of tasks and milestones in a baseline plan to track the progress of the project. It also defines the size of the test effort. The Test Plan document is derived from the Product Description, Software Requirement Specification SRS, or Use Case Documents. The Test Plan document is usually prepared by the Test Lead or Test Manager and the focus of the document is to describe what to test, how to test, when to test and who will do what test. This practical is useful for students to learn to prepare test plan for Notepad or any other window based application by preparing its test cases and test plan.

II. Relevant Program Outcomes (POs)

- **Discipline knowledge:** Apply computer engineering discipline - specific knowledge to solve core computer engineering related problems.
- **Experiments and practice:** Plan to perform experiments and practices to use the results to solve broad-based computer engineering problems.
- **Engineering tools:** Apply relevant computer technologies and tools with an understanding of the limitations.
- **The engineer and society:** Assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to practice in field of computer engineering.
- **Individual and team work:** Function effectively as a leader and team member in diverse/ multidisciplinary teams.
- **Life-long learning:** Engage in independent and life-long learning activities in the context of technological changes in the computer engineering field and allied industry.

III. Competency and Practical skills

This practical is expect to develop the following skills in you

Apply types, levels and methods of software testing on applications.

1. Identify the mobile application with its specification and get familiar with the application.
2. Use the different software testing concepts.
3. Ability to write test case of the MS-Window based application.
4. Ability to design test plan for given MS-Window based application.

IV. Relevant Course Outcome(s)

- Prepare test plan for an application.

V. Practical Outcome (PrOs)

a) Design test plan and test cases for Notepad (MS Window based) Application.

VI. Relevant Affective domain related Outcome(s)

1. Follow ethical practices.
2. Participate in team problem solving activities.
3. Prioritizes time effectively to meet the needs of the team and self.

VII. Minimum Theoretical Background

Test plan is derived from SRS (Software Requirement Specification) which is prepared by test lead or manager. The main goal of test plan is to include all the details related to testing such as what to test, when to test, how to test and who will be the tester. Test plan is often not updated but if there is some new feature or change is introduced then it has to be updated accordingly.

Procedure:

1. Open the Notepad or any MS Window based application.
2. Determine the scope that need to be tested and that are NOT to be tested.
3. Prepare the document of Test Strategy.
4. Decide Entry and Exit criteria.
5. Evaluate the test estimate.
6. Plan when and how to test and decide how the test results will be evaluated, and define test exit criterion.
7. Test artifacts delivered as part of test execution.
8. Define the management information, including the metrics required and defect resolution and risk issues.
9. Ensure that the test documentation generates repeatable test assets.

VIII. Additional Resources required

Sr. No.	Name of Resource	Specification	Quantity	Remarks
1	Hardware: Computer System	Computer (i3-i5 preferable), RAM minimum 2 GB and onwards, HDD free Space 1GB or More	As per batch size	For all Practical of Test Case Generation
2	Operating system	Windows 7 or latest/LINUX version 5.0 or later		
3	Software	Any Word Processing tool such as Libre Office, Open Office. Any MS window application		

IX. Precautions

1. Note down the expected output for each test case carefully.
2. Select required test methodology and module(s).

X. Additional Resources used

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XI. Result (Output of the procedure)

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XII. Practical Related Questions

N***ote: Below given are few sample questions for reference. Teacher must design more such questions so as to ensure the achievement of identified CO.***

(Note: Use Point VIII to X and XIII to XV for all relevant practical exercise use blank pages provided or attach more pages if needed.)

1. Identify the components used in the Test Plan documents?
2. State the benefits of Test Plan.
3. Define Test Deliverables.
4. State the use of Test Case Specification. Enlist the Test Case Specification Identifiers.

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XIII. Exercise

Attempt Q1. and teacher shall allot Q.2/Q.3 from the following:

(Note: Use Point VIII to X and XIII to XV for all relevant programming exercise use blank pages provided or attach more pages if needed.)

1. Test the option available in Notepad. Prepare the Test plan for the same.
2. Prepare test plan with test cases for the "Page Setup" option.
3. Test the option "Word Wrap" of Format menu and prepare the Test plan for the same.

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XIV. References / Suggestions for further Reading

1. https://www.softwaretestinghelp.com
2. https://artoftesting.com/manualTesting/notepad.html

XV. Assessment Scheme

Performance Indicators		Weightage
Process related(15 Marks)		**30%**
1.	Tool Selection Ability	20%
2.	Follow ethical practices.	10%
Product related (35 Marks)		**70%**
3.	Verifying of System requirement Specification	20%
4.	Correctness in Use of Test Parameters	15%
5.	Generation and Execution of Test Case	15%
6.	Timely Submission of report	10%
7.	Answer to sample questions	10%
Total (50 Marks)		**100% (50)**

List of Students /Team Members

1. ……..
2. ……..
3. ……..

Marks Obtained			Dated signature of Teacher
Process Related(15)	**Product Related(35)**	**Total(50)**	

Practical No. 10: Generate Defect report for Library Management System.

I. Practical Significance

Defect report is a consolidated manuscript which describes a defect which was uncover by test engineer. Defect report is use to describe the problem bug which was discovered so that it can be easily identified by developers which can be resolve in later stage. It contains details of necessary steps that are to be followed when the software application which does not give expected output. Defect report is most effective way to communicate, track, and explain defects to the stakeholders. In this practical a learner will be able to generate a defect report for Library Management System.

II. Relevant Program Outcomes (POs)

- **Basic knowledge:** Apply knowledge of basic mathematics, sciences and basic engineering to solve the broad-based Computer engineering problem.
- **Discipline knowledge:** Apply computer engineering discipline - specific knowledge to solve core computer engineering related problems.
- **Experiments and practice:** Plan to perform experiments and practices to use the results to solve broad-based computer engineering problems.
- **Engineering tools:** Apply relevant computer technologies and tools with an understanding of the limitations.
- **Ethics:** Apply ethical principles for commitment to professional ethics, responsibilities
  and norms of the practice also in the field of computer engineering.
- **Communication:** Communicate effectively in oral and written form.

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III. Competency and Practical skills

This practical is expect to develop the following skills in you

Apply types, levels and methods of software testing on applications.

1. Identify system with its specification and get familiar with the system.
2. Use the different software testing concepts.
3. Ability to write system specification of the systems.
4. Ability to design test case for given systems.

IV. Relevant Course Outcome(s)

- Identify bugs to create defect report of given application.

V. Practical Outcome (PrOs)

a) Prepare defect report after executing test cases for library management system

VI. Relevant Affective domain related Outcome(s)

1. Use management system appropriately.
2. Participate in team problem solving activities.
3. Prioritizes time effectively to meet the needs of the team and self.

VII. Minimum Theoretical Background

Defects are loopholes in application(s) that are leftover accidentally while development of application. A case where actual result is differed from expected

result while performing software test then it is known as defect. A test engineer needs to generate appropriate defect report so that it is easy for developer to understand exact problem with system and same can be resolved. While resolving defect one need to assign appropriate status for each defect. Usually there are several status of defect i.e. New, Assigned, Open, Resolved, Closed etc. Each defect has its severity based on which one can prioritize defects while solving them.

Procedure:

1. Select appropriate tool to generate defect report(Like any text editor/web based tool)
2. Identify required modules of the system which is to be tested and for whom defect report is to be generated.
3. Identify required parameters such as Severity, Priority, and Status etc.
4. Prepare and generate Defect report for defects which were uncovered while testing.
5. Verify defect report as per the specification by executing test data on required library management system.

VIII. Additional Resources required

Sr. No.	Name of Resource	Specification	Quantity	Remarks
1	Hardware: Computer System	Computer (i3-i5 preferable), RAM minimum 2 GB and onwards, HDD free Space 1GB or More	As per batch size	For all Practical of Test Case Generation
2	Operating system	Windows 7 or latest/LINUX version 5.0 or later		
3	Software	Any Word Processing tool such as Libre Office, Open Office. Any web-application/ website		

IX. Precautions

1. Note down the expected output for each test case carefully.
2. Maintain the status of defect and manage same.

X. Additional Resources used

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XI. Result (Output of the procedure)

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XII. Practical Related Questions

N*ote: Below given are few sample questions for reference. Teacher must design more such questions so as to ensure the achievement of identified CO.*

(Note: Use Point VIII to X and XIII to XV for all relevant practical exercise use blank pages provided or attach more pages if needed.)

1. Compare Defect, error and failure.
2. Describe different status of Defects.
3. Describe various defects reporting process with example.

(Space for answers)

XIII. Exercise

Attempt Q1. and teacher shall allot Q. 2/Q.3 from the following:

(Note: Use Point VIII to X and XIII to XV for all relevant programming exercise use blank pages provided or attach more pages if needed.)

1. Generate online library management system with the help of following website. Perform at least 4 tests for same. Prepare defect report for library management system.
   - https://librarika.com/
2. Generate online library management system with the help of following website. Perform at least 3 tests for same. Prepare defect report for library management system.
   - https://www.libib.com/

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XIV. References / Suggestions for further Reading

1. http://www.learnerswindow.com/library-management-sample-test-cases/
2. http://www.learnerswindow.com/library-management-sample-test-plan/

XV. Assessment Scheme

Performance Indicators		Weightage
Process related(15 Marks)		**30%**
1.	Tool Selection Ability	20%
2.	Follow ethical practices.	10%
Product related (35 Marks)		**70%**
3.	Verifying of System requirement Specification	20%
4.	Correctness in Use of Test Parameters	15%
5.	Generation and Execution of Test Case	15%
6.	Timely Submission of report	10%
7.	Answer to sample questions	10%
Total (50 Marks)		**100%**

List of Students /Team Members

1. ……..
2. ……..
3. ……..

Marks Obtained			Dated signature of Teacher
Process Related(15)	**Product Related(35)**	**Total(50)**	

Practical No. 11: Validating Defect report for ATM Machine.

I. Practical Significance

ATM is one of the most consumed systems in human day to day life. Large pool of people is active user of ATM machine on daily basis. ATM is one of the integral parts of banking system which facilitate use of banking application and make baking convenient for customer. Hence it becomes very much essential to validate functionality of ATM machine and prepare defect report for same. The defect report will enable developer to build flawless system and provide best possible application. In this practical a learner will be able to generate a defect report for ATM Machine System.

II. Relevant Program Outcomes (POs)

- **Basic knowledge:** Apply knowledge of basic mathematics, sciences and basic engineering to solve the broad-based Computer engineering problem.
- **Discipline knowledge:** Apply computer engineering discipline - specific knowledge to solve core computer engineering related problems.
- **Experiments and practice:** Plan to perform experiments and practices to use the results to solve broad-based computer engineering problems.
- **Engineering tools:** Apply relevant computer technologies and tools with an understanding of the limitations.
- **Ethics:** Apply ethical principles for commitment to professional ethics, responsibilities and norms of the practice also in the field of Computer engineering.
- **Communication:** Communicate effectively in oral and written form.

III. Competency and Practical skills

This practical is expect to develop the following skills in you

Apply types, levels and methods of software testing on applications.

1. Identify system with its specification and get familiar with the system.
2. Use the different software testing concepts.
3. Ability to write system specification of the systems.
4. Ability to prepare defect report for given systems.

IV. Relevant Course Outcome(s)

- Identify bugs to create defect report of given application.

V. Practical Outcome (PrOs)

a) Prepare defect report after executing test cases for Withdrawn of amount from ATM Machine.

VI. Relevant Affective domain related Outcome(s)

1. Use ATM System appropriately.
2. Participate in team problem solving activities.
3. Prioritizes time effectively to meet the needs of the team and self.

VII. Minimum Theoretical Background

Generating a Defect Report is very much important in a scenario where developers and test engineers are working in different team / different place. This gives clear idea to the developer regarding the flaws that was generated during implementation phase. The test engineer is expected to be precise with defect report so that the development team can track problem easily. During the life span of defect it transits from various phases. Since test engineer generates the defect it becomes more important to track the status of same and update it at regular interval. The status of defect report will enable project manager to track the defect and take necessary measurements.

Procedure:

1. Select appropriate tool to generate defect report(Like any text editor/web based tool)
2. Identify required modules of the system which is to be tested and for whom defect report is to be generated.
3. Identify required parameters such as Severity, Priority, and Status etc.
4. Prepare and generate Defect report for defects which were uncovered while testing.
5. Verify defect report as per the specification by executing test data on required library management system.

VIII. Additional Resources required

Sr. No.	Name of Resource	Specification	Quantity	Remarks
1	Hardware: Computer System	Computer (i3-i5 preferable), RAM minimum 2 GB and onwards, HDD free Space 1GB or More	As per batch size	For all Practical of Test Case Generation
2	Operating system	Windows 7 or latest/LINUX version 5.0 or later		
3	Software	Any Word Processing tool such as Libre Office, Open Office. http://www.motc.gov.qa/en/ditoolkit/migrant-workers/cash-machine-simulator-atm		

IX. Precautions

1. Note down the expected output for each test case carefully.
2. Select required test methodology and module(s).

X. Additional Resources used

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XI. Result (Output of the procedure)

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XII. Practical Related Questions

N*ote: Below given are few sample questions for reference. Teacher must design more such questions so as to ensure the achievement of identified CO.*

(Note: Use Point VIII to X and XIII to XV for all relevant practical exercise use blank pages provided or attach more pages if needed.)

1. Define Defect Deduction Percentage.
2. Describe Defect reporting process.
3. Describe Defect report template.

(Space for answers)

XIII. Exercise

Attempt Q1. and teacher shall allot Q. 2/Q.3 from the following:

(Note: Use Point VIII to X and XIII to XV for all relevant programming exercise use blank pages provided or attach more pages if needed.)

1. Use ATM machine system simulator with the help of following website. Perform at given task and generate test case. Prepare defect report for ATM machine system.
   - Task
     1. Enter Pin number of 4 digits.
     2. Select Amount to be withdrawn.
     3. In other functions, Check for Balance on Screen,
     4. In other functions, Print Mini Statement
     5. Verify functionality of Change Pin number.
     6. Verify withdrawal of amount excess of 5000.
   - http://www.motc.gov.qa/en/ditoolkit/migrant-workers/cash-machine-simulator-atm
2. Generate online ATM machine system with the help of following website. Perform at least 3 tests for same. Prepare defect report for library management system.
   - Task
     1. Enter Pin number more than 4 digits.
     2. Select Amount to be withdraw in withdrawal enter amount as 21$.
     3. Validate the functionality of fund transfer,
     4. Validate the functionality of print receipt.
   - http://oclf.org/atm/ATM.html

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XIV. References / Suggestions for further Reading

1. http://oclf.org/atm/ATM.html
2. http://www.motc.gov.qa/en/ditoolkit/migrant-workers/cash-machine-simulator-atm

XV. Assessment Scheme

Performance Indicators		Weightage
Process related(15 Marks)		**30%**
1.	Tool Selection Ability	20%
2.	Follow ethical practices.	10%
Product related (35 Marks)		**70%**
3.	Verifying of System requirement Specification	20%
4.	Correctness in Use of Test Parameters	15%
5.	Generation and Execution of Test Case	15%
6.	Timely Submission of report	10%
7.	Answer to sample questions	10%
Total (50 Marks)		**100%**

List of Students /Team Members

1. ……..
2. ……..
3. ……..

Marks Obtained			Dated signature of Teacher
Process Related(15)	**Product Related(35)**	**Total(50)**	

Practical No. 12: Executing Test Case to Generate Defect Report for Login.

I. Practical Significance

Login is first and foremost step to provide basic security to any standalone or web based application. This module eliminates basic threat which can come towards system from beginners or intermediate sources of attackers. Login process indeed provides all types of authentication and authorization so that only legitimated user(s) can have access to the system. In view of providing security to the system one need to have rigorous verification of login module. The test engineer needs to verify all kind of testing such as interface testing, SQL Injection, DOS/DDOS etc. In this practical the student will be able to work with different interfaces to execute test cases and generate Defect report for login interface.

II. Relevant Program Outcomes (POs)

- **Basic knowledge:** Apply knowledge of basic mathematics, sciences and basic engineering to solve the broad-based Computer engineering problem.
- **Discipline knowledge:** Apply computer engineering discipline - specific knowledge to solve core computer engineering related problems.
- **Experiments and practice:** Plan to perform experiments and practices to use the results to solve broad-based computer engineering problems.
- **Engineering tools:** Apply relevant computer technologies and tools with an understanding of the limitations.
- **Ethics:** Apply ethical principles for commitment to professional ethics, responsibilities and norms of the practice also in the field of Computer engineering.
- **Life-long learning:** Engage in independent and life-long learning activities in the context of technological changes in the computer engineering field and allied industry.

III. Competency and Practical skills

This practical is expect to develop the following skills in you

Apply types, levels and methods of software testing on applications.

1. Identify system with its specification and get familiar with the system.
2. Use the different software testing concepts.
3. Ability to write system specification of the systems.
4. Ability to design defect report for given systems.

IV. Relevant Course Outcome(s)

- Identify bugs to create defect report of given application.

V. Practical Outcome (PrOs)

a) Prepare defect report after executing test cases for any login form.

VI. Relevant Affective domain related Outcome(s)

1. Use management system appropriately.
2. Participate in team problem solving activities.
3. Prioritizes time effectively to meet the needs of the team and self.

VII. Minimum Theoretical Background

Login module is directly connected with database of user where it is likely to have most of the confidential information about the user. While delivering an application one need to have a close eye on security. Providing an interface which will look after the authentication and segregating valid user from invalid user become very much important in such systems. The test engineer is expected to design a test case in such a way system is safe in all dimensions and hence while designing test case more emphasis should be given on security testing. The defect report shall be covering all possible ways that system is likely to be attacked and hence finding vulnerabilities within system becomes vital. Once the test engineer can identifies these weaknesses of a system them the developer can work out these highlighted areas to achieve maximum security.

Procedure:

1. Select appropriate tool to generate defect report(Like any text editor/web based tool)
2. Identify required modules of the system which is to be tested and for whom defect report is to be generated.
3. Identify required parameters such as Severity, Priority, and Status etc.
4. Prepare and generate Defect report for defects which were uncovered while testing.
5. Verify defect report as per the specification by executing test data on required library management system.

VIII. Additional Resources required

Sr. No.	Name of Resource	Specification	Quantity	Remarks
1	Hardware: Computer System	Computer (i3-i5 preferable), RAM minimum 2 GB and onwards, HDD free Space 1GB or More	As per batch size	For all Practical of Test Case Generation
2	Operating system	Windows 7 or latest/LINUX version 5.0 or later		
3	Software	Any Word Processing tool such as Libre Office, Open Office. https://codepen.io/opensoorce/pen/KQmvdL		

IX. Precautions

1. Mark status for each defect reported.
2. Select required test methodology and module(s).

X. Additional Resources used

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XI. Result (Output of the procedure)

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XII. Practical Related Questions

N***ote: Below given are few sample questions for reference. Teacher must design more such questions so as to ensure the achievement of identified CO.***

(Note: Use Point VIII to X and XIII to XV for all relevant practical exercise use blank pages provided or attach more pages if needed.)

1. What is the significance of encryption while saving password in database?
2. Give the significance of POST method while performing operations on web based app.
3. Define step to write a defect report for given application.

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XIII. Exercise

Attempt Q1. and teacher shall allot Q. 2/Q.3 from the following:

(Note: Use Point VIII to X and XIII to XV for all relevant programming exercise use blank pages provided or attach more pages if needed.)

1. Use Login system simulator with the help of following website. Perform at given task and generate test case. Prepare defect report for Login system.
   - Task
     1. Enter invalid user name.
     2. Enter invalid password.
     3. Enter password with only 3 characters.
     4. Enter user name as "*invitado"* and password as "*hgm2015"*.
   - https://codepen.io/opensoorce/pen/KQmvdL

2. Consider any web base system which provides login procedure. Perform following tests for same. Prepare defect report for Login System.
   - Task
     1. Verify forgot password link.
     2. Test user name as "STEPR" and password as "STEPR".
     3. Verify captcha for given system

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XIV. References / Suggestions for further Reading

1. https://codepen.io/opensoorce/pen/KQmvdL
2. https://www.softwaretestinghelp.com/test-cases-for-atm/

XV. Assessment Scheme

Performance Indicators		Weightage
Process related(15 Marks)		**30%**
1.	Tool Selection Ability	20%
2.	Follow ethical practices.	10%
Product related (35 Marks)		**70%**
3.	Verifying of System requirement Specification	20%
4.	Correctness in Use of Test Parameters	15%
5.	Generation and Execution of Test Case	15%
6.	Timely Submission of report	10%
7.	Answer to sample questions	10%
Total (50 Marks)		**100%**

List of Students /Team Members

1. ……..
2. ……..
3. ……..

Marks Obtained			Dated signature of Teacher
Process Related(15)	**Product Related(35)**	**Total(50)**	

Practical No. 13: Design and run test cases for WordPad (MS Windows based) using an Automated Tool.

I. Practical Significance

Every software development group tests its products, but delivered software always has defects. Test engineers strive to catch them before the product is released but they always creep in and they often reappear, even with the best manual testing processes. Test Automation software is the best way to increase the effectiveness, efficiency and coverage of software testing. Automated testing is significantly faster than a manual approach so by learning this practical student will be able to test the MS window applications and generate the test reports with the help of any automation software testing tools.

II. Relevant Program Outcomes (POs)

- **Discipline knowledge:** Apply computer engineering discipline - specific knowledge to solve core computer engineering related problems.
- **Experiments and practice:** Plan to perform experiments and practices to use the results to solve broad-based computer engineering problems.
- **Engineering tools:** Apply relevant computer technologies and tools with an understanding of the limitations.
- **Individual and team work:** Function effectively as a leader and team member in diverse/ multidisciplinary teams.
- **Communication:** Communicate effectively in oral and written form.
- **Life-long learning:** Engage in independent and life-long learning activities in the context of technological changes in the computer engineering field and allied industry.

III. Competency and Practical skills

This practical is expect to develop the following skills in you

Apply types, levels and methods of software testing on applications.

1. Get familiar WordPad application.
2. Use the different software testing concepts.
3. Ability to write test case of the WordPad (MS-Window based) application.
4. Ability to design test plan for given WordPad (MS-Window based) application.

IV. Relevant Course Outcome(s)

- Test software for performance measures using automated testing tools.

V. Practical Outcome (PrOs)

a) Design test plan and test cases for Wordpad(MS Window based) using an Automation tool.

VI. Relevant Affective domain related Outcome(s)

1. Follow ethical practices.
2. Participate in team problem solving activities.
3. Prioritizes time effectively to meet the needs of the team and self.

VII. Minimum Theoretical Background

Test automation increases the overall software efficiency and ensures robust software quality. There are specific tools that can effectively execute automated test cases, and help in comparing actual and expected results. In this manner, automated testing can guarantee software proficiency without involving repeated and manual intervention. Test Tool selection largely depends on the project requirements.

Procedure:

1. The scope of Automation needs to be determined in detail before the start of the project.
2. Select the right automation tool as per requirements.
3. Choose an appropriate framework.
4. Open WordPad or any MS Window based application.
5. Standards have to be followed while writing/recording the scripts for Automation.
6. Create/Record uniform scripts, comments, and indentation of the code.
7. User-defined messages should be coded or standardized for Error Logging for testers to understand.(If applicable)
8. Measure metrics- Success of automation capture by using the following metrics parameters such as-
   - Percent of defects found
   - The time required for automation testing for each and every release cycle
   - Minimal Time is taken for release
   - Customer Satisfaction Index
   - Productivity improvement

VIII. Additional Resources required

Sr. No.	Name of Resource	Specification	Quantity	Remarks
1	Hardware: Computer System	Computer (i3-i5 preferable), RAM minimum 2 GB and onwards, HDD free Space 1GB or More	As per batch size	For all Practical of Test Case Generation
2	Operating system	Windows 7 or latest/LINUX version 5.0 or later		
3	Software	Any automated testing tool (Freeware like selenium, Appium. Robotium Cucumber. Watir.)		

IX. Precautions

1. Note down the expected output for each test case carefully.
2. Select required test methodology and module(s).

X. Additional Resources used

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XI. Result (Output of the procedure)

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XII. Practical Related Questions

N***ote: Below given are few sample questions for reference. Teacher must design more such questions so as to ensure the achievement of identified CO.***

(Note: Use Point VIII to X and XIII to XV for all relevant practical exercise use blank pages provided or attach more pages if needed.)

1. State the benefits of Automation Testing.
2. Enlist the different types of software testing that can be automated.
3. State the criterion's to choose an Automation Tools.
4. Enlist the software testing tools available.

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XIII. Exercise

Attempt Q1. and teacher shall allot Q.2/Q.3 from the following:

(Note: Use Point VIII to X and XIII to XV for all relevant programming exercise use blank pages provided or attach more pages if needed.)

1. Test the "View" option available in WordPad application. Attached the recorded script.
2. Test the procedure of opening and closing WordPad application using the Automation Tool and attached screen shots.
3. Test the basic "login" functionality for any application using automated tool. Write down the related test cases or attached the screen shots.

(Space for answers)

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XIV. References / Suggestions for further Reading

1. https://searchsoftwarequality.techtarget.com/definition/automated-software-testing
2. https://www.softwaretestinghelp.com/automation-testing-tutorial-1/

XV. Assessment Scheme

Performance Indicators		Weightage
Process related(15 Marks)		**30%**
1.	Tool Selection Ability	20%
2.	Follow ethical practices.	10%
Product related (35 Marks)		**70%**
3.	Verifying of System requirement Specification	20%
4.	Correctness in Use of Test Parameters	15%
5.	Generation and Execution of Test Case	15%
6.	Timely Submission of report	10%
7.	Answer to sample questions	10%
Total (50 Marks)		**100%**

List of Students /Team Members

1. ……..
2. ……..
3. ……..

Marks Obtained			Dated signature of Teacher
Process Related(15)	**Product Related(35)**	**Total(50)**	

Practical No. 14: Design and run test cases for MS Word application using an Automated Tool

I. Practical Significance

Automation Testing is a technique using an automation tool to write and execute test scripts and cases. The main goal of Automation Testing is to reduce the number of test cases to be run manually. Testers use appropriate automation tools to develop the test scripts and validate the software. Microsoft Word or MS-WORD is Graphical word processing programs that allow users to type and save documents. So by learning this practical student will be able to test the MS Word applications using Automated Tool.

II. Relevant Program Outcomes (POs)

- **Discipline knowledge:** Apply computer engineering discipline - specific knowledge to solve core computer engineering related problems.
- **Experiments and practice:** Plan to perform experiments and practices to use the results to solve broad-based computer engineering problems.
- **Engineering tools:** Apply relevant computer technologies and tools with an understanding of the limitations.
- **Individual and team work:** Function effectively as a leader and team member in diverse/ multidisciplinary teams.
- **Communication:** Communicate effectively in oral and written form.

III. Competency and Practical skills

This practical is expect to develop the following skills in you

Apply types, levels and methods of software testing on applications.

1. Get familiar MS Word application.
2. Use the different software testing concepts.
3. Ability to write test case of the MS Word application.
4. Ability to design test plan for given MS Word application.

IV. Relevant Course Outcome(s)

- Test software for performance measures using automated testing tools.

V. Practical Outcome (PrOs)

a) Design and run test cases for MS Word application using an Automated Tool.

VI. Relevant Affective domain related Outcome(s)

1. Follow ethical practices.
2. Participate in team problem solving activities.
3. Prioritizes time effectively to meet the needs of the team and self.

VII. Minimum Theoretical Background

Automation testing is a technique uses an application to implement entire life cycle of the software in less time and provides efficiency and effectiveness to the testing software. Automation testing is an Automatic technique where the tester writes scripts by own and uses suitable software to test the software. It is basically an automation

process of a manual process. Like regression testing, Automation testing also used to test the application from load, performance and stress point of view. In other word, Automation testing uses automation tools to write and execute test cases, no manual involvement is required while executing an automated test suite. Usually, testers write test scripts and test cases using the automation tool and then group into test suites. The main goal of Automation testing is to increase the test efficiency and develop software value.

Procedure:

1. Identify areas within software to automate.
2. Choose the appropriate tool for test automation.
3. Write test scripts.
4. Develop test suits.
5. Execute test scripts.
6. Build result reports.
7. Find possible bugs or performance issue.

VIII. Additional Resources required

Sr. No.	Name of Resource	Specification	Quantity	Remarks
1	Hardware: Computer System	Computer (i3-i5 preferable), RAM minimum 2 GB and onwards, HDD free Space 1GB or More	As per batch size	For all Practical of Test Case Generation
2	Operating system	Windows 7 or latest/LINUX version 5.0 or later		
3	Software	MS Word application		

IX. Precautions

1. Note down the expected output for each test case carefully.
2. Select required test methodology and module(s).

X. Additional Resources used

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XI. Result (Output of the procedure)

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XII. Practical Related Questions

N*ote: Below given are few sample questions for reference. Teacher must design more such questions so as to ensure the achievement of identified CO.*

(Note: Use Point VIII to X and XIII to XV for all relevant practical exercise use blank pages provided or attach more pages if needed.)

1. Compare any two software testing tools used in automation testing.
2. List some advantages and disadvantages of Automation testing.
3. Enlist the different factors which are determining the effectiveness of Automation testing.
4. State some good coding practices while automation.

(Space for answers)

XIII. Exercise

Attempt Q1. and teacher shall allot Q.2/Q.3 from the following:

(Note: Use Point VIII to X and XIII to XV for all relevant programming exercise use blank pages provided or attach more pages if needed.)

1. Write test cases for copy & paste in MS Word using appropriate Automation Tool.
2. Design possible Test cases for Save option in M.S word. Attached the sample test cases.
3. Test the "Insert Table" option available in the MS Word. Write the suitable test cases. Run the Test cases using Automation testing tool.

(Space for answers)

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XIV. References / Suggestions for further Reading

1. https://searchsoftwarequality.techtarget.com/definition/automated-software-testing
2. https://www.softwaretestinghelp.com/test-case-template-examples/

XV. Assessment Scheme

Performance indicators		Weightage
Process related(15 Marks)		**30%**
1.	Tool Selection Ability	20%
2.	Follow ethical practices.	10%
Product related (35 Marks)		**70%**
3.	Verifying of System requirement Specification	20%
4.	Correctness in Use of Test Parameters	15%
5.	Generation and Execution of Test Case	15%
6.	Timely Submission of report	10%
7.	Answer to sample questions	10%
Total (50 Marks)		**100%**

List of Students /Team Members

1. ……..
2. ……..
3. ……..

Marks Obtained			Dated signature of Teacher
Process Related(15)	**Product Related(35)**	**Total(50)**	

Practical No. 15: Project Assignment

PART A - Plan

Title of Micro-Project

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1.0 Rationale

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2.0 Literature Review

(Existing status, knowledge required to complete the chosen task in about 200 to 500 words)

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3.0 Proposed Methodology

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4.0 Action Plan (Sequence and time required for major activity)

S. No.	Details of activity (Hours/ Week)	Planned Start date	Planned Finish date	Name of Responsible Team Members
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				

5.0 Resources Required (major resources such as raw material, some machining facility, software etc.)

S. No.	Name of Resource/material	Specifications	Qty	Remarks
1				
2				
3				
4				
5				
6				
7				
8				

PART B (Outcomes after Execution and)

6.0 Course Outcomes Integrated

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7.0 Literature Review

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8.0 Actual Procedure Followed.

Write step wise the work was done, including which team member did what work and how the data was analyzed (if any)**.**

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9.0 Actual Resources Used

(Mention the actual resources used)**.**

S. No.	Name of Resource/material	Specifications	Qty	Remarks
1				
2				
3				
4				
5				

10.0 Outputs of the Micro-Projects

(Students are expected to attaché printout of testcase(s) / Defect Reports for Micro project topic)

11.0 Skill Developed / learning out of this Micro-Project

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12.0 Applications of this Micro-Project

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13.0 Area of Future Improvement

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List Of Laboratory Manuals Developed by MSBTE

First Semester:

1	Fundamentals of ICT	22001
2	English	22101
3	English Work Book	22101
4	Basic Science (Chemistry)	22102
5	Basic Science (Physics)	22102

Second Semester:

1	Bussiness Communication Using Computers	22009
2	Computer Peripherals & Hardware Maintenace	22013
3	Web Page Design with HTML	22014
4	Applied Science (Chemistry)	22202
5	Applied Science (Physics)	22202
6	Applied Machines	22203
7	Basic Surveying	22205
8	Applied Science (Chemistry)	22211
9	Applied Science (Physics)	22211
10	Fundamental of Electrical Engineering	22212
11	Elements of Electronics	22213
12	Elements of Electrical Engineering	22215
13	Basic Electronics	22216
14	'C' programming Language	22218
15	Basic Electronics	22225
16	Programming in "C"	22226
17	Fundamentals of Chemical Engineering	22231

Third Semester:

1	Applied Multimedia Techniques	22024
2	Advanced Serveying	22301
3	Highway Engineering	22302
4	Mechanics of Structures	22303
5	Building Construction	22304
6	Concrete Technology	22305
7	Strength Of Materials	22306
8	Automobile Engines	22308
9	Automobile Transmission System	22309
10	Mechanical Operations	22313
11	Technology Of Inorganic Chemicals	22314
12	Object Oriented Programming Using C++	22316
13	Data Structure Using 'C'	22317
14	Computer Graphics	22318
15	Database Management System	22319
16	Digital Techniques	22320
17	Principles Of Database	22321
18	Digital Techniques & Microprocessor	22323
19	Electrical Circuits	22324
20	Electrical & Electronic Measurment	22325
21	Fundamental Of Power Electronics	22326
22	Electrical Materials & Wiring Practice	22328
23	Applied Electronics	22329
24	Electrical Circuits & Networks	22330
25	Electronic Measurments & Instrumentation	22333
26	Principles Of Electronics Communication	22334
27	Thermal Engineering	22337
28	Engineering Matrology	22342
29	Mechanical Engineering Materials	22343
30	Theory Of Machines	22344

Fourth Semester:

1	Hydraulics	22401
2	Geo Technical Engineering	22404
3	Chemical Process Instrumentation & Control	22407
4	Fluid Flow Operation	22409
5	Technology Of Organic Chemicals	22410
6	Java Programming	22412
7	GUI Application Development Using VB.net	22034
8	Microprocessor	22415
9	Database Managment	22416
10	Electric Motors And Transformers	22418
11	Industrial Measurements	22420
12	Digital Electronics And Microcontroller Applications	22421
13	Linear Integrated Circuits	22423
14	Microcontroller & Applications	22426
15	Basic Power Electronics	22427
16	Digital Communication Systems	22428
17	Mechanical Engineering Measurments	22443
18	Fluid Mechanics and Machinery	22445
19	Fundamentals Of Mechatronics	22048

Fifth Semester:

1	Design of Steel and RCC Structures	22502
2	Public Health Engineering	22504
3	Heat Transfer Operation	22510
4	Environmental Technology	22511
5	Operating Systems	22516
6	Advanced Java Programming	22517
7	Software Testing	22518
8	Control Systems and PLC's	22531
9	Embedded Systems	22532
10	Mobile and Wireless Communication	22533
11	Industrial Machines	22523
12	Switchgear and Protection	22524
13	Energy Conservation and Audit	22525
14	Power Engineering and Refrigeration	22562
15	Solid Modeling and Additive Manufacturing	22053
16	Guidelines & Assessment Manual for Micro Projects & Industrial Training	22057

Sixth Semester:

1	Solid Modeling	17063
2	Highway Engineering	17602
3	Contracts & Accounts	17603
4	Design of R.C.C. Structures	17604
5	Industrial Fluid Power	17608
6	Design of Machine Elements	17610
7	Automotive Electrical and Electronic Systems	17617
8	Vehicle Systems Maintenance	17618
9	Software Testing	17624
10	Advanced Java Programming	17625
11	Mobile Computing	17632
12	System Programing	17634
13	Testing & Maintenance of Electrical Equipments	17637
14	Power Electronics	17638
15	Illumination Engineering	17639
16	Power System Operation & Control	17643
17	Environmental Technology	17646
18	Mass Transfer Operation	17648
19	Advanced Communication System	17656
20	Mobile Communication	17657
21	Embedded System	17658
22	Process Control System	17663
23	Industrial Automation	17664
24	Industrial Drives	17667
25	Video Engineering	17668
26	Optical Fiber & Mobile Communication	17669
27	Therapeutic Equipment	17671
28	Intensive Care Equipment	17672
29	Medical Imaging Equipment	17673

Pharmacy Lab Manual

First Year:

1	Pharmaceutics - I	0805
2	Pharmaceutical Chemistry - I	0806
3	Pharmacognosy	0807
4	Biochemistry and Clinical Pathology	0808
5	Human Anatomy and Physiology	0809

Second Year:

1	Pharmaceutics - II	0811
2	Pharmaceutical Chemistry - II	0812
3	Pharmacology & Toxicology	0813
4	Hospital and Clinical Pharmacy	0816

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