# Technical Assessment

1. Elaborate on the differences between test cases and test plans with relevant examples.

Ans:  The key differences between test cases and test plans with relevant examples are:

| Test Case | Test Plan |
|---|---|
| 1. A test case is a set of actions required to test a specific functionality of a software application. | 1. A test plan is a document that provides comprehensive information on the test strategy, testing scope, goal, and time required for software testing. |
| 2. The test case is written by QA testers and provides step-by-step instructions for each test iteration.  Test cases often include two variations: one with valid input data and another with invalid input data. | 2. It includes details on the different elements of the test process like test items, features to be tested, assigned testing tasks, the level of tester independence, the test environment, test design techniques, entry and exit criteria. |
| 3. The primary purpose of a test case is to evaluate the performance of different features within software applications and ensure they adhere to relevant standards, guidelines, and user requirements. | 3.  It focuses on defining test objectives and deliverables, assigning tasks and responsibilities, detailing the test environment and configuration, and establishing the test schedule for streamlined and productive testing. |
| 4. Test cases can be generated manually or through an automated approach. Manual test cases, written by testers, involve verifying and validating the software application's functionality manually. Automated test cases, executed using automation testing frameworks and tools, adhere to the Software Requirement Specification (SRS). | 4. The test plan is a communication tool among project team members, testers, and stakeholders. A test plan is a project management document that includes essential components for effective project management. |
| 5. Example: Testing the "Forgot Password" link with a valid email: steps, inputs, and expected outcomes. | 5. Example: A strategy to test all user account management features, including login, registration, and recovery. |

2.  A headphone is produced with a detachable microphone. The microphone works only after being connected to the headset. The headphone also has a switch with different buttons - volume, microphone on/off. Now, develop a generalised test case for a freshly produced headphone with all of the scenarios.

## Test Case 1: Verify Volume Control Buttons

| Component | Details |
|---|---|
| **Prerequisites** | The headphone is connected to a device that supports volume control. |
| **Test Setup** | Device (smartphone/PC) with the latest operating system; headphones connected via jack/USB. |
| **Test ID** | TC-HP001 |
| **Test Name** | Verify Volume Control Buttons |
| **Test Case Description** | Check the functionality of volume increase and decrease buttons. |
| **Test Scenario** | Adjust the volume using the volume buttons on the headphone. |
| **Test Objective** | Ensure volume buttons function correctly and adjust the volume in both directions. |
| **Test Steps** | 1. Connect the headphone to a test device. 2. Press the volume up button. 3. Press the volume down button. |
| **Test Data** | N/A |
| **Test Parameters** | Volume button increments and decrements. |
| **Test References** | Device compatibility requirements. |
| **Expected Results** | Volume increases when the "up" button is pressed and decreases when the "down" button is pressed. No lag or distortion occurs. |
| **Actual Results** | To be filled after execution. |

## Test Case 2: Verify Detachable Microphone Functionality

| Component | Details |
|---|---|
| **Prerequisites** | Detachable microphone is available and securely connected to the headphone. |
| **Test Setup** | A test device capable of recording audio (e.g., smartphone or PC). |
| **Test ID** | TC-HP002 |
| **Test Name** | Verify Detachable Microphone Functionality |
| **Test Case Description** | Test whether the microphone works only when connected. |
| **Test Scenario** | Record audio with and without the microphone attached. |
| **Test Objective** | Confirm that the microphone functions only when connected to the headphone. |
| **Test Steps** | 1. Attach the microphone to the headphone. 2. Record audio using the connected microphone. 3. Detach the microphone and attempt to record audio again. |
| **Test Data** | N/A |
| **Test Parameters** | Audio input presence/absence based on microphone connection. |
| **Test References** | Microphone integration and functionality requirements. |
| **Expected Results** | Audio is recorded clearly when the microphone is connected, and no audio is recorded when it is detached. |
| **Actual Results** | To be filled after execution. |

## Test Case 3: Verify Microphone Toggle Switch

| Component | Details |
|---|---|
| **Prerequisites** | Headphone and microphone are securely connected. |
| **Test Setup** | Test device capable of recording audio. |

| | |
|---|---|
| **Test ID** | TC-HP003 |
| **Test Name** | Verify Microphone Toggle Switch |
| **Test Case Description** | Check the functionality of the microphone on/off toggle switch. |
| **Test Scenario** | Toggle the microphone on and off during recording. |
| **Test Objective** | Ensure the toggle switch properly enables/disables the microphone. |
| **Test Steps** | 1. Attach the microphone to the headphone. 2. Set the toggle switch to "on" and record audio. 3. Set the toggle switch to "off" and attempt to record again. |
| **Test Data** | N/A |
| **Test Parameters** | Microphone on/off states. |
| **Test References** | Microphone toggle functionality requirements. |
| **Expected Results** | Audio is recorded when the toggle is "on" and not recorded when the toggle is "off." |
| **Actual Results** | To be filled after execution. |

## Test Case 4: Verify Device Compatibility

| Component | Details |
|---|---|
| **Prerequisites** | Devices with different operating systems and audio input/output support. |
| **Test Setup** | Test devices: Smartphone, PC, gaming console. |
| **Test ID** | TC-HP004 |
| **Test Name** | Verify Device Compatibility |
| **Test Case Description** | Test headphone compatibility across various devices. |

| Test Scenario | Connect the headphone to different devices and check audio and microphone functions. |
|---|---|
| Test Objective | Confirm the headphone is compatible with multiple devices. |
| Test Steps | 1. Connect the headphone to a smartphone and test audio and microphone. 2. Repeat on a PC and gaming console. |
| Test Data | N/A |
| Test Parameters | Compatibility with device types. |
| Test References | Device compatibility requirements. |
| Expected Results | Headphone functions seamlessly (audio and microphone) across all tested devices. |
| Actual Results | To be filled after execution. |

## Test Case 5: Verify Durability of Microphone Connection

| Component | Details |
|---|---|
| Prerequisites | Detachable microphone and headphones. |
| Test Setup | Secure environment for repeated attachment/detachment tests. |
| Test ID | TC-HP005 |
| Test Name | Verify Durability of Microphone Connection |
| Test Case Description | Test the durability of the microphone connection. |
| Test Scenario | Attach and detach the microphone multiple times and check for functionality. |
| Test Objective | Ensure the microphone remains functional after repeated attachment/detachment cycles. |
| Test Steps | 1. Attach and detach the microphone 50 times. 2. Verify the secure fit and functionality after each cycle. |

| | |
|---|---|
| **Test Data** | N/A |
| **Test Parameters** | Attachment/detachment cycles. |
| **Test References** | Durability requirements for the detachable microphone. |
| **Expected Results** | The microphone remains securely attached and fully functional after multiple cycles. |
| **Actual Results** | To be filled after execution. |

3. Prepare a test plan for the above headphone produced.

Ans:

## Test Plan for Headphone with Detachable Microphone

**1. Research and Analyze the Product**

1. **Product Description:** A headphone with a detachable microphone, volume control buttons, and a microphone on/off switch. The microphone functions only when connected to the headset.
2. **User Demographics:**
   a. Primary users: Gamers, professionals for calls, and audiophiles.
   b. Secondary users: Casual listeners using mobile phones or computers.
3. **Key Features to Test:**
   a. Volume control buttons.
   b. Microphone connectivity and functionality.
   c. Microphone toggle switch.
   d. Compatibility across multiple devices (e.g., PC, smartphones, gaming consoles).
   e. Durability of the microphone connection mechanism.

**2. Test Strategy and Objectives**

1. **Test Strategy:**
   a. Perform both manual and automated testing.

b. Use black-box testing techniques for user-facing features.
c. Utilize regression testing for updates and fixes.
d. Conduct stress and durability tests for hardware components.
2. **Testing Objectives:**
   a. Ensure all features function as intended across various use scenarios.
   b. Verify compatibility with different device platforms.
   c. Assess durability and reliability of the microphone attachment after repeated use.

## 3. Test Criteria

1. **Entry Criteria:**
   a. Completion of product design and development.
   b. Availability of prototype hardware and firmware.
   c. Signed-off requirements and test plans.
   d. Test data and test environments are set up and verified.
2. **Exit Criteria:**
   a. All critical defects resolved and verified.
   b. Execution of all planned test cases with a pass rate of 95% or higher.
   c. Performance benchmarks met, including durability tests.
   d. Sign-off from the QA team and stakeholders.

## 4. Test Environment

1. **Hardware Requirements:**
   a. Prototype headphone with detachable microphone.
   b. Smartphones, PCs, and gaming consoles for compatibility tests.
   c. Testing devices with various operating systems (Windows, macOS, Android, iOS).
2. **Software Requirements:**
   a. Audio recording software for microphone testing.
   b. Automation testing tools like Selenium or Cypress for system compatibility tests.
   c. Cloud-based testing platform (e.g., LambdaTest) for extended device compatibility.
3. **Test Tools:**
   a. Decibel meters for audio output verification.
   b. Force measurement tools for durability testing.
   c. Logging software to capture test results.

**5. Test Schedule**

| Task | Responsible Team Member | Duration |
|---|---|---|
| Product Analysis and Test Plan | QA Lead | 2 Days |
| Test Case Design | QA Engineers | 3 Days |
| Environment Setup | DevOps | 2 Days |
| Functionality Testing | QA Team | 5 Days |
| Compatibility Testing | QA Engineers | 3 Days |
| Durability Testing | Hardware Test Team | 4 Days |
| Performance Testing | QA Engineers | 3 Days |
| Bug Fixing and Re-testing | Development Team | 5 Days |
| Final Validation and Sign-Off | QA Lead and Stakeholders | 2 Days |

**6. Deliverables**

1. **Documents Created Before Testing:**
   a. Test plan document.
   b. Test cases and scripts.
   c. Test environment setup document.
2. **Documents Created During Testing:**
   a. Test execution logs.
   b. Defect reports with screenshots and logs.
3. **Documents Created After Testing:**
   a. Test summary report.
   b. Traceability matrix.
   c. User acceptance report.

## 7. Test Scenarios

| Scenario ID | Test Scenario | Expected Outcome |
|---|---|---|
| TS-001 | Verify volume control functionality | Volume adjusts smoothly with no distortion or lag. |
| TS-002 | Test detachable microphone connectivity | Microphone records audio only when connected. |
| TS-003 | Test microphone toggle switch functionality | Microphone functions when "on" and is muted when "off." |
| TS-004 | Verify device compatibility | Headphones function seamlessly across smartphones, PCs, and gaming consoles. |
| TS-005 | Durability testing of microphone attachment | Microphone remains functional and securely attached after repeated attach/detach cycles. |
| TS-006 | Test audio output for clarity | Audio output remains clear and consistent at all volume levels. |

## Approval

| Stakeholder | Role | Approval Date |
|---|---|---|
| Product Manager | Product Owner | 2025 |
| QA Lead | Test Planning | 2025 |
| Development Lead | Development Team | 2025 |

According to the Future Of Quality Assurance Survey, 30.07% of organizations prefer open-source platforms for generating and managing test reports, and 19.16% do not have a structured reporting system in place or do not use any tool for reporting, indicating a need for improvement in test reporting practices. However, This test plan and test cases comprehensively cover all functionalities of the headphone, ensuring its quality, performance, and user satisfaction before launch.

4. Explain the difference between bug and issue by explaining bug cycle steps.

| Bugs | Issue |
|------|-------|
| 1. A technical error or defect in the software code. | 1. A broader problem or concern affecting the product or project, which may include bugs, usability concerns, or feature requests. |
| 2. Typically detected by developers or testers. | 2. Reported by users, clients, stakeholders, or team members. |
| 3. Developers are responsible for fixing bugs. | 3. Project managers or product owners are responsible for managing issues. |
| 4. Has a fixed lifecycle (New → Assigned → In Progress → Fixed → Retesting → Verified → Closed). | 4. Variable lifecycle depending on the type, priority, and complexity of the issue. |
| 5. Requires technical fixes or code changes. | 5. May require a broader approach, including cross-department collaboration, investigation, and decision-making. |
| 6. A button not working as expected in an app is an example. | 6. An issue where the app is not user-friendly or has inconsistent design. |
| 7. Affects software functionality and performance. | 7. Affects overall software quality, usability, or project flow. |
| 8. Typically isolated and can be resolved through code adjustments. | 8. Can be multifaceted, involving various aspects of the project or product. |

**Bug Cycle (Steps in the Bug Life Cycle):**

The **bug life cycle** describes the series of stages a bug goes through from its identification to its resolution and closure. The bug cycle steps include:

| Step | Description |
|---|---|
| **1. New** | When a bug is initially reported, it is labeled as "New." This is the initial state after a tester or user identifies a potential issue in the software. |
| **2. Assigned** | Once a bug is confirmed, it is assigned to a developer for investigation and fixing. |
| **3. In Progress** | The developer works on fixing the bug. The status changes to "In Progress" during this stage. |
| **4. Fixed** | The developer has fixed the bug, and the fix is ready for testing. The bug is moved to the "Fixed" stage. |
| **5. Retesting** | The QA team retests the software to verify that the bug has been fixed. They check if the fix resolves the issue without causing new issues. |
| **6. Verified** | If the bug fix is successful and the issue is resolved, the bug is marked as "Verified" by the QA team. |
| **7. Closed** | Once the bug has been verified and no further issues are found, it is closed, indicating that the bug has been successfully fixed. |
| **8. Reopened** | If, during retesting or after the bug is fixed, the issue persists or reoccurs, the bug can be reopened. This step sends the bug back into the development cycle for further attention. |

## Defect/Bug Life Cycle Stages
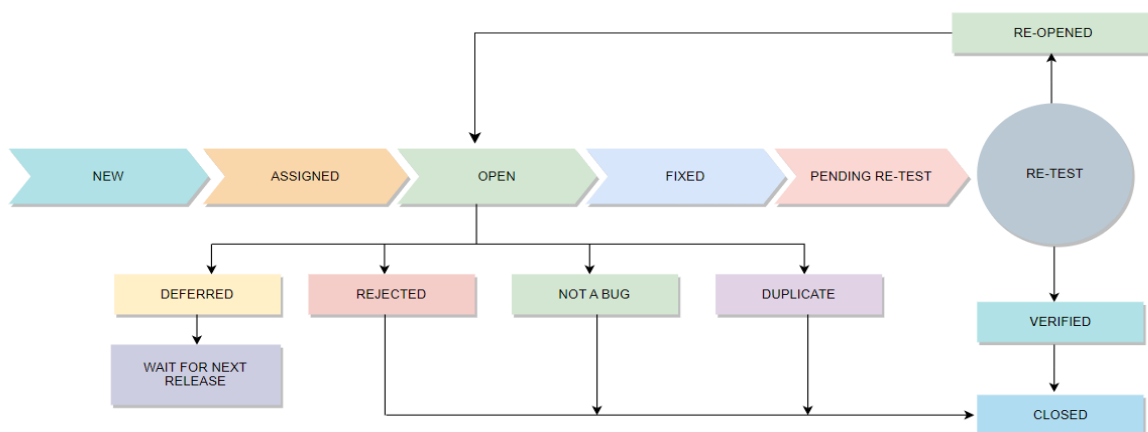
5. Prepare a bug report for the failed cases of the headphones.

## Bug Report for Failed Headphone Test Cases

**Bug ID**: HP-001

**Reported By**: Sneha Shrestha
 **Date**: 22nd December, 2024
 **Test Case ID**: TC-HP003, TC-HP005

**Summary:**

There are issues with the functionality of the microphone toggle switch and the microphone connection. The microphone does not work as expected after being detached, and the microphone toggle switch fails to properly enable/disable the microphone.

**Bug Details:**

**1. Bug Title:** Microphone Toggle Switch Not Working as Expected

**Test Case ID**: TC-HP003

**Description**: The microphone toggle switch fails to properly toggle between "on" and "off" states, resulting in no audio capture when the toggle is set to "on" or no audio cut-off when the toggle is set to "off."

**Steps to Reproduce:**

1. Attach the microphone to the headphone.
2. Set the microphone toggle switch to "on."
3. Speak into the microphone to test if it captures audio.
4. Set the microphone toggle switch to "off."
5. Speak again to test if the microphone stops capturing audio.

**Expected Result**: The microphone should capture audio when the toggle is set to "on" and stop capturing when set to "off."

**Actual Result**: The microphone fails to capture audio when toggled to "on," and continues to capture audio even when toggled to "off."

**Severity**: High
 **Priority**: P1 (Critical)
 **Status**: Open

**Environment**: Headphones model XYZ, Firmware version 1.0
**Device Tested On**: Laptop, Smartphone
**Attachments**: [Screenshot/Video of the issue, if applicable]

**2. Bug Title:** Microphone Detachment Fails to Stop Audio Recording

**Test Case ID**: TC-HP005

**Description**: When the microphone is detached from the headset, the audio recording continues to function without interruption, contrary to expected behavior.

**Steps to Reproduce:**

1. Attach the microphone to the headphone.
2. Record audio using the test device.
3. Detach the microphone.
4. Continue recording to verify if the microphone is no longer functioning.

**Expected Result**: The microphone should stop recording audio once detached from the headset.

**Actual Result**: Audio continues to be recorded even after the microphone is detached.

**Severity**: Medium
**Priority**: P2 (Major)
**Status**: Open
**Environment**: Headphones model XYZ, Firmware version 1.0
**Device Tested On**: Laptop, Smartphone
**Attachments**: [Screenshot/Video of the issue, if applicable]

**Steps to Fix:**

1. Investigate the issue with the microphone toggle switch, possibly related to a faulty internal mechanism or coding error.
2. Review the detachment detection mechanism to ensure it halts the audio capture when the microphone is disconnected.
3. Test the functionality after code fixes and verify the resolution of both issues.

**Assigned To**: Developer Name
**Expected Fix Date**: 23rd January, 2025
**Report Status**: On going
**Comments**:

6. Explain briefly about UI/UX Tests and prepare a Checklist for UI/UX Testing.

Ans:

**UI Testing (User Interface Testing):**
UI testing ensures the graphical elements of an application work as expected. It verifies that buttons, menus, text fields, images, and other interface components are displayed correctly, are functional, and provide a smooth interaction for the user.

**UX Testing (User Experience Testing):**
UX testing focuses on the user's interaction with the application, assessing the ease of use, intuitiveness, and satisfaction with the overall experience. It identifies pain points or areas where the application may fail to meet user expectations.

While UI testing ensures the functionality and appearance of interface elements, UX testing evaluates the overall experience of the user.

## UI/UX Testing Checklist

**UI Testing:**

1. **Design Consistency:**
   a. Check alignment, spacing, font, and color consistency.
   b. Verify responsive design across devices and resolutions.
2. **Functionality:**
   a. Test buttons, links, forms, and dropdowns.
   b. Validate input fields and error messages.
3. **Compatibility:**
   a. Test across browsers (Chrome, Firefox, Safari, Edge) and operating systems.
4. **Visual Appearance:**
   a. Ensure readability with proper contrast.
   b. Verify hover/click states and adherence to brand guidelines.

**UX Testing:**

1. **Navigation and Flow:**
   a. Ensure intuitive navigation and logical workflows.
   b. Verify proper placement of CTAs (Call to Action).
2. **Accessibility:**
   a. Check screen reader support and keyboard navigability.
   b. Verify compliance with accessibility standards (e.g., WCAG).

3. **Performance:**
   a. Test page load times and responsiveness under different loads.
4. **Error Handling:**
   a. Confirm clear error messages and smooth recovery from errors.
5. **User Feedback:**
   a. Test feedback (e.g., animations, loading indicators) for interactive elements.
   b. Gather user feedback via surveys or usability tests.

7. If you encounter a technology or tool you're not familiar with during an internship project, how would you go about learning it?

Ans:

The first thing I would do is learn the fundamentals of the tool myself using YouTube and Google resources. Once I have an overview, I would dive deeper into any unclear concepts by asking ChatGPT to explain them in layman's terms. To gain hands-on experience, I would seek guidance from mentors around me who are already working with the tool or technology I am unfamiliar with. Additionally, I believe learning is a continuous process in the field of technology, so I would stay updated about emerging trends by reading research papers and other online resources.

8. You can provide your personal experience here that motivates you for this work, which is why you selected QA for the internship.

Ans:

Greetings, I am Sneha Shrestha, currently in my 8th semester, studying for a Bachelor's in Computer Science and Information Technology at St. Xavier's College. As a computer science student, the intersection between technology, entrepreneurship, and sustainability fascinates me the most. I am a Hult Prize Finalist at the Melbourne Business School, Australia, and I hope to pursue technology entrepreneurship in the future. As a Quality Assurance intern at Intuji, I will be able to apply my knowledge and leadership experiences in a professional setting to make a difference. I want to learn how quality standards are maintained in the field of technology, and as a research student at St. Xavier's College, I love asking the right questions and finding solutions, which require a lot of patience and smart work. I want to participate in projects, no matter how large or small, with a positive attitude and learn on the go. Being an intern at Intuji is an honor I will dearly hold for a lifetime because it will be the first internship opportunity of my life, allowing me to prove myself and open new doors in my career.

As a first-generation college student from a humble middle-class family, my parents were never given the chance to pursue education beyond basic schooling to show their full potential and make a difference in the world. They had to start life at an early age. I want to succeed in life for both them and myself. My parents, who are already in their 40s and 50s, are strongly involved in social service, through which economic enhancement has been minimal. They have earned great respect and happiness from their unforgettable deeds, but not a good income.

I question myself every day: what am I doing to make this world better than yesterday? As a college student, my options are limited. But one is only as limited as one chooses to be. I want to use technology as a force for good in my community. How do I blend my curiosity for learning and knowledge with the advocacy I strongly believe in? How do I incorporate a meaningful, rigorous study curriculum with a cause I am passionate about? I need and deserve an opportunity because every expert was once an intern.

Sneha Shrestha, St.Xavier's College