Introduction to Quality Assurance

Q1: What is the difference between QA and QC?

Q2: How do SDLC and STLC differ in terms of stages involved?

Q3: What is the shift left concept in Software Testing?

Project Management Tools

Q4: How do Project Management Tools assist in making the process more smooth?

Q5: You have been assigned a bug-fixing task in a project management tool like Jira. Outline the process you would follow to document and track this issue from start to resolution.

Testing Approaches

Q6: You've been given the following requirements for a login page:

- Users must enter a valid email address and password.
- The system should display an error message if either the email or password is incorrect.

  Design **three test cases** for this login page

  1. Mention the black box technique you used and why
  2. Specify inputs, expected outputs, and any preconditions.

Q7: Refer to the code below:

```javascript
function findMax(arr) {
  let max = arr[0];
  for (let i = 1; i < arr.length; i++) {
    if (arr[i] > max) {
      max = arr[i];
    }
  }
  return max;
}
```

a. Perform **statement testing** on the `findMax` function. Identify all the executable statements and design test cases to ensure each statement is executed at least once.
b. Perform **branch testing** on the `findMax` function. Identify the decision points (branches) and provide test cases to ensure that all branches are fully tested.

Q8a: Calculate the cyclomatic complexity of the following code:

```javascript
function checkValue(num) {
  if (num > 10) {
    console.log("High");
  } else if (num > 5) {
    console.log("Medium");
  } else {
    console.log("Low");
  }
}
```

Q8b: Based on the cyclomatic complexity, how many test cases would you need to ensure complete coverage of this code?

Testing Techniques

Q9: You've been asked to perform **functional testing** on a shopping cart feature. The cart should:

- Add an item when the "Add to Cart" button is clicked.
- Update the total price correctly.
- Remove items when the "Remove" button is clicked.

Task: Design **four functional test cases** (with specific inputs and expected outputs) to validate this functionality.

Q10: A new mobile app has just been developed, and you are in charge of testing its **usability**. Identify **three usability aspects** you would focus on during testing and explain how you would test each one.

Q11: Consider the code below:

```
#include <iostream>;
using namespace std;
int double calculateAverage(int arr[], int n) {
    int sum = 0;
    for (int j = 1; i <= 10; i+-) {
        sum += arr[i];
    }
    return sum / 10
}

int main() {
    int numbers[] = {10, 20, 30, 40, 50};
    int size = size_of(numbers);

    double avg = calculateAverage(numbers, size, 10);
    cout << "The average is: " << avg << endl;
}
```

Using static testing techniques, list down as many errors as possible in the code above.

Bug Tracking

Q1: What is bug tracking, and why is it important in software development?

Q2: How do bug tracking tools facilitate communication between QA and development teams?

SDLC Models

Q3: What is the Software Development Life Cycle (SDLC), and what are its main phases?

Q4: Explain the differences between the Waterfall, Agile, and Spiral SDLC models. In what scenarios would each model be most effective?

Q5: Why is it essential to choose an appropriate SDLC model for a project?

Development Types

Q6: Differentiate b/w Behavior-Driven Development (BDD), Test-Driven Development (TDD), and Acceptance Test-Driven Development (ATDD).

Testing Activities

Q7:Describe the phases of the testing activity cycle. How do these phases contribute to the overall quality assurance process?

Manual Testing

Q8:On the following website: https://academybugs.com/find-bugs/, identify and list as many bugs as you can find. Follow the bug report format outlined in the roadmap and include all the necessary parameters.

Frontend Automation

Q1: Create a simple login page using HTML, CSS styling and JavaScript.

Q2: Choose a frontend automation tool and write a basic script to automate the e2e process for the site you developed above. Document your approach and any challenges you faced.

Backend Automation

Q3: Explain the role of APIs in software applications. Why are they crucial for modern software development?

Q4: Use Postman to test a public API (e.g., OpenWeatherMap API). Create requests for at least three different endpoints and document your findings, including response status, response time, and any errors encountered.

Q5: Create a Postman collection that includes various API endpoints for a sample application. Include test scripts in your collection to validate responses.

Mobile Automation

Q6: Research and summarize the basics of mobile automation. What are the key tools and frameworks available for mobile testing, and what are their primary features?

Q7: Discuss some common challenges faced during mobile automation testing. How would you address these challenges in your testing strategy?

Performance Testing

Q9: What is the difference between load testing and stress testing?

Q10: Write a basic JMeter script to perform load testing on any web application. Include steps for setting up the test plan, configuring the thread group, and adding listeners to capture results. What do the graphs and metrics indicate about the application’s performance? How would you determine if the performance is acceptable?