THE OPEN UNIVERSITY OF SRI LANKA
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. DEGREE PROGRAMME 2023/2024
FINAL EXAMINATION
CSU5301: SOFTWARE QUALITY ASSURANCE
DURATION: TWO HOURS ONLY (2 HRS)

Date: 05.04.2024   Time: 02.00 p.m.-04.00 p.m.

Answer **Four** Questions **Only**.

Q1)

1. Describe the importance of having a *Requirements Traceability Matrix* in the software quality assurance process.

2. Explain the following key elements of a test case;
   a. Test case description
   b. Test steps
   c. Input data
   d. Expected result
   e. Actual result

3. ABC company plans to release a Fleet Management System to track the vehicles in a fleet. The Software Quality Assurance lead executing test cases realized the number of defects count remains consistent after the functional test cycle and two consecutive regression cycles.
   a. Describe the importance of having a test case document in the test execution process.
   b. Explain the reason for having a smoke test case execution before functional test case execution.
   c. Describe the benefits of regression testing.
   d. Explain the process to avoid a higher defect injection rate during the latter part of the test case execution levels.

Q2)

1. Explain the advantages of early test case design.

2. Describe the following black box test case design techniques.
   a. Equivalence partitioning
   b. Boundary value analysis
   c. State transition test case design technique

3. Please find below the decision table written to select the discount eligible for different customers registered with a bookshop.

	TC1	TC2	TC3	TC4	TC5	TC6	TC7	TC8
Conditions								
New customers (15%)	T	T	T	T	F	F	F	F
Loyalty Card (10%)	T	T	F	F	T	T	F	F
Coupon (20%)	T	F	T	F	T	F	T	F
Actions								
Discount (%)	X	X	20	15	30	10	20	0

   a. Analyzing the above decision table, lists the output to be displayed for the following condition combinations.
      i.   When a new user has a loyalty card with a coupon card.
      ii.   When a new user has a loyalty card only.

   b. List down the condition combinations for the following output.
      i.   A user is eligible for a 15% discount.
      ii.   A user is eligible for a 30% discount.
      iii. A user has a 0 discount.

Q3)

   1. Explain the following defect management life cycle which is used to manage defects during the software quality assurance process.
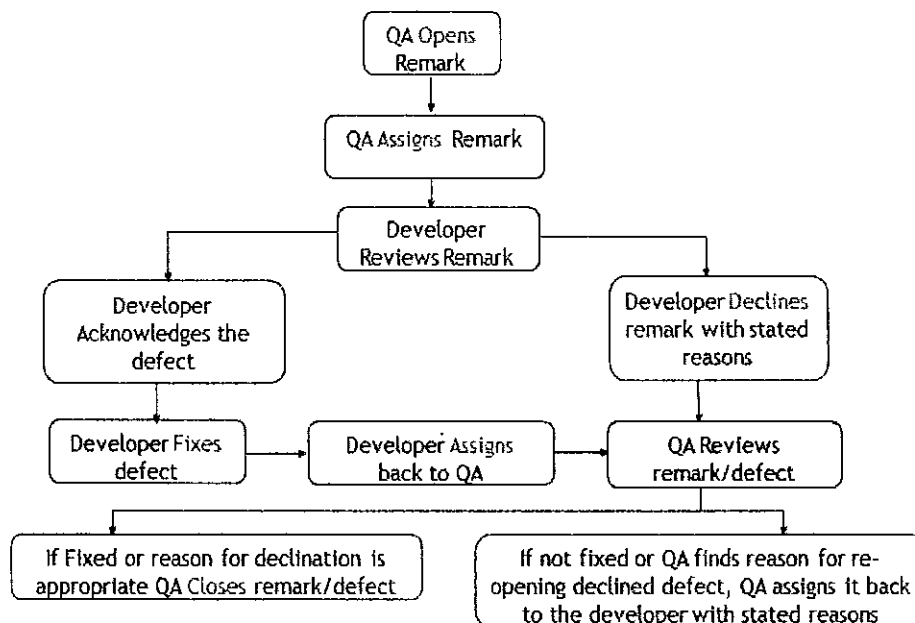
2.

    a. Describe the following defect reject reasons.
      i.   Duplicate
      ii. Work as designed
      iii. Deferred

    b. Explain the following severity levels when reporting a defect into a defect management system.
      i.   Critical
      ii. High
      iii. Medium
      iv. Low

3. A Transport Management System crashes once a user uploads an order file to create the orders in the system.
    a. What is the priority of the defect?
    b. What is the severity of the defect?

Q4)

1.

    a. Explain the importance of defect prevention activities in the software development life cycle.
    b. Describe the following people-based review techniques.
      i.   Review
      ii. Inspection
      iii. Walkthrough

2. Explain the solutions for the following common problems in the software development process.
    a. Poor requirement
    b. Change requirement
    c. Poor test coverage
    d. Unrealistic schedule
    e. Miscommunication

3. A SQA team performed two regression test cycles after a functional test for an accounting system and noticed defect count remained at the same level.
    a. Discuss the advantages of smoke testing.
    b. Explain the root cause with the steps to overcome the above scenario.

Q5)

1.
   a. Describe the importance of;
      i. Product metrics
      ii. Project metrics
      iii. Process metrics
   b. Discuss the quality gap in the software quality assurance process.

2. Briefly explain the following risks associated with the software quality assurance process.
   a. No involvement of static testing methodologies.
   b. Lack of knowledge of test case design techniques.
   c. Different teams joined for the User Acceptance Testing other than those who joined to provide the requirement.
   d. Not maintaining the Requirement Traceability Metrix (RTM).

3. Tharindu is a Software Quality Assurance Manager and manages a Vehicle Maintenance Module (VMM) to track vehicle service records. Once after a test design review, he identified test coverage had not met up to the expected standard.
   a. What are the project and project risks in the above example?
   b. Discuss the four steps of risk mitigation in the software quality assurance process.

Q6)

1.
   a. Discuss the importance of configuration management in the software development process.
   b. Describe the key areas of configuration management.

2.
   a. Explain the advantages of automation testing.
   b. Discuss why the following test levels mostly involve manual test case execution.
      i. Functional test
      ii. User acceptance test

3.
   a. Describe the importance of performance testing a web application.

   b. Briefly describe the following performance test types:
      i. Load test.
      ii. Stress test.
      iii. Scalability test.