THE OPEN UNIVERSITY OF SRI LANKA
DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE
B.Sc. DEGREE PROGRAMME 2015/2016
FINAL EXAMINATION
CPU3147: SOFTWARE QUALITY ASSURANCE
DURATION: **TWO HOURS ONLY (2 HOURS)**

11ᵗʰ July, 2016   **Time: 9.30 a.m. to 11.30a.m.**

Answer **FOUR** Questions **ONLY**.

Q1).

  I.

    a) Describe the involvement of '*static testing*' and '*dynamic testing*' in the software development life cycle (SDLC).

    b) Explain the difference between a walk-through and an inspection.

    c) Describe the importance of code review in the defect prevention process.

    d) Discuss the benefits of the review process in SDLC.

  II.   Supun is a QA Lead of 'product A' in ABC company. He discovered 100 bugs in the functional test case execution. Once he received the defect fixes he retested the defects and executed a regression test execution cycle. Then he was able to identify another 96 defects in 'product A'. After few regression test execution cycles, he identified there is an average of 90 defects open in each cycle.

    a) Describe the benefits of regression testing.

    b) As a QA Lead, what is the mechanism that Supun can follow to avoid higher defect inject rate at dynamic testing.

    c) Discuss the importance of a 'Requirement Traceability Matrix in the software quality assurance process.

    d) Briefly explain the solutions for the following key problems in the software development process.

        a. Poor requirements

        b. Unrealistic schedule

        c. Changes to the requirement

Q2).

I.

a) Describe the following attributes of a good test case.

    a. Effectiveness

    b. Exemplary

    c. Evolvable

    d. Economical

b) Discuss the entry criteria and exit criteria for the test case writing process.

c) Explain the following key elements of a test case,

    a. Test case id

    b. Test case description

    c. Test steps

    d. Expected results

    e. Actual result

    f. Input data

    g. Test status

d) Discuss the advantages of maintaining test case documents in the software quality assurance process.
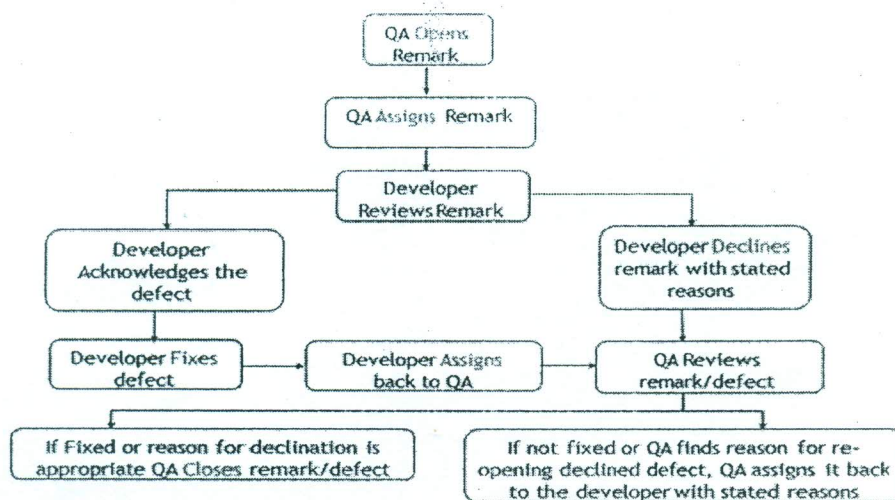
II. A tester wrote test cases for a product and he raised the defects for failed test cases. But the developer has rejected the most of the defects with the reason 'Work as designed'.

a) Explain the root cause of the above situation.

b) Describe the process that the tester can follow to avoid the above situation.

Q3).

I.

a) Describe the defect management life cycle shown below.

b) Explain the following defect statuses used to decline a defect:

- Duplicate

- Deferred

- Not reproducible

II. A tester has observed that the logo of the 'product A' is truncated at the top left corner of the web page when executing the User Interface (UI) test cases.

a) What is the priority of the above defect?

b) What is the severity of the above defect?

c) Developer has fixed the defect and when the tester retested the defect he observed it is not fixed according to the requirement. What is the defect status that the tester can change now?

d) Explain the following elements in an effective defect report.

    a. Defect ID

    b. Defect Summary

    c. Steps to reproduce

    d. Defect Severity

    e. Defect Priority

Q4)

I.

a) Describe the terms "entry criteria" and the "exit criteria" in the test case design process.

b) Explain the advantages of early test case design.

c) Explain the factors that need to be considered when selecting a test case design technique.

a) Explain why exhaustive testing is impossible in the software quality assurance process.

II.   Consider the decision table written for an ATM machine given below.

Consider the following decision table describing the same ATM.						
Condition	1	2	3	4	5	6
Valid Card	N	Y	Y	Y	Y	Y
Cancel	-	Y	N	N	N	N
Valid PIN	-	-	N	N	Y	Y
Invalid PIN=3	-	-	N	Y	N	N
Balance Ok	-	-	-	-	N	Y
Action						
Return Card	Y	Y	N	Y	N	Y
Reenter PIN	N	N	Y	N	N	N
Reenter Request	N	N	N	N	Y	N
Dispense Cash	N	N	N	N	N	Y

By analyzing this decision table, list down the actions to be performed for the following condition combinations.

a) When a user inserts an invalid card.

b) When a user enters an invalid pin for three times.

c) User clicks on the cancel button after inserting a valid card.

d) User inserts a valid card and enters the correct pin and has a sufficient amount of money in the account.

Q5).

I.

a) Explain the advantages of independent testing.

b) Describe the importance of:

    a. Product metrics

    b. Process metrics

    c. Project metrics

c) Discuss the quality gap in the software quality assurance process.

d) List down the costs of quality? Briefly explain each of them.

II.   Janaka is a QA lead of a product in health care domain and he had 5 testers in his team. In the middle of a test execution cycle, one of his team members suddenly got sick and did not report to work for two weeks. In this case, Janaka and the rest of the team members had to work long hours to meet the deadline of the execution cycle.

a) What are the project and product risks in the above example.

b) Discuss the four steps of risk management in the software development process.

c) Briefly explain the following risks associated with the software quality assurance process.

    a. Not enough training/lack of test competency

    b. Lack of testing tools

    c. Lack of management understanding and support for testing

    d. Lack of customer and user involvement

Q6).

I.

    a. Discuss the importance of configuration management in the software development process.

    b. Describe the key areas of configuration management.

II.

    a. Explain the benefits of automated testing.

    b. What kind of test cases cannot be automated? Explain your answer.

III.

    a. Describe why performance testing is important for web applications.

    b. Briefly describe the following performance test types:

- Load test
- Stress test
- Scalability test