

The Open University of Sri Lanka
Faculty of Natural Sciences
B. Sc/ B. Ed Degree Programme



Department	: Computer Science
Level	: 05
Name of the Examination	: Final Examination
Course Code and Title	: CSU5301/CPU3147 Software Quality Assurance
Academic Year	: 2019/2020
Date	: 11.11.2020
Time	: 9.30 am -11.30 am
Duration	: Two (02) Hours

General Instructions

1. Read all instructions carefully before answering the questions.
2. This question paper consists of **six (06)** questions in **five (05)** pages.
3. Answer any **four (04)** questions only. All questions carry equal marks.
4. Answer for each question should commence from a new page.
5. Draw fully labelled diagrams where necessary.
6. Involvement in any activity that is considered as an exam offense will lead to punishment.
7. Use blue or black ink to answer the questions.
8. Clearly state your index number in your answer script.

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

Q1).

I.

- a. Describe the involvement of '*static testing*' and '*dynamic testing*' in the software development life cycle.
- b. Describe the importance of reviews in the process of defect prevention.

II.

Briefly describe the solutions to the following major problems in the software development process.

- a. Poor requirements
- b. Unrealistic schedule
- c. Changes to the requirement
- d. Inadequate testing

III. XYZ Company plans to release a software to be used in an Operation Theater of a hospital. The QA lead executing the test cases realized that a number of defects persisted after the functional testing and two consecutive regression cycles.

- a. Describe the benefits of regression testing.
- b. Explain the process to avoid high defect injection rates during the dynamic detection phase of the project.
- c. Discuss the importance of the 'Requirement Traceability Matrix' as the exit criteria in the test case writing process.

Q2).

I.

- a. Explain the advantages of early test case design.
- b. Explain why exhaustive testing is not possible in the software quality assurance process.

II. Briefly describe the following steps used by company A to write test cases using use case test design technique.

- a. Requirement analysis to clarify gaps in the requirements.
- b. Identify basic flow/s of features.
- c. Identify alternative flow/s for the features.
- d. Perform an activity diagram.
- e. Identify test scenarios with path flow analysis.

III. Please find below the written decision table for selecting applicants for different credit card categories in Bank A.

	1	2	3	4	5	6	7	8	9	10	11	12
Conditions												
Income	H	H	H	H	M	M	M	M	L	L	L	L
Credit Score \geq 750	Y	Y	N	N	Y	Y	N	N	Y	Y	N	N
Homeowner?	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
Actions:												
Platinum Card	X	X										
Gold Card			X	X	X	X	X		X			
Black Card								X		X		
Denied											X	X

- a. When does a user become eligible for a 'Platinum Card'?
- b. When does a user become eligible for a 'Gold Card'?
- c. When does a user become not eligible for any credit card?
- d. Identify the credit card category that a user will receive for the following scenarios.
 - i. Medium income, Credit Score is 650 and not own a home
 - ii. Medium income, Credit Score is 850 and not own a home
 - iii. High income, Credit Score is 600 and own a home
 - iv. Low income, Credit Score is 850 and not own a home

Q3).

- I. Describe the following attributes of a good test case.
 - a. Effectiveness
 - b. Exemplary
 - c. Evolvable
 - d. Economical
- II. Explain the elements listed below in a test case document.

Test Case ID	Test Case Description	Test Steps	Input Data	Expected Results	Actual Results	Test Status

- III. A test leader noticed that, most of the defects reported against the product 'A' were being rejected by the development team under the 'work as designed' tag.
- Explain the root cause for the above example.
 - Describe the process that the tester can follow in order to avoid the above situation.
 - Discuss the advantages of maintaining test case documents in the software quality assurance process.

Q4).

- Explain the following elements used in reporting a defect to a development team.
 - Defect ID
 - Defect Summary
 - Defect Severity
 - Defect Priority
 - Target Version
- Explain the following defect statuses used to decline a defect reported by the QA team.
 - Duplicate
 - Deferred
 - Not reproducible
- The tester has observed that, the login functionality does not work with the correct username and the correct password when executing functional test cases. The communicated defect severity guidelines in the test plan are as follows;
 - Critical - System Failure
 - High - Basic user flow failure
 - Medium - Alternative user flow failure
 - Low - Cosmetic defect
 - What is the priority of the above defect?
 - What is the severity of the above defect?
 - The defect has been fixed by the developer and when the tester retests the defect he/she has observed that it has not been fixed as required.
What is the defect status that the tester can change now?

Q5).

I.

- a. Describe the importance of;
 - i. Product metrics
 - ii. Project metrics
 - iii. Process metrics

b. What is 'quality gap' in the software quality assurance process? Discuss.

II. Briefly describe the following risks associated with the software quality assurance process.

- a. Not enough training/Lack of test competency.
- b. Lack of management understanding and support for testing.
- c. Lack of customer and user involvement.
- d. Not having traceability to written test cases vs features.

III. Kelum is a QA leader of a product of the telecommunication domain and his team consists of six (06) testers. A member of his team suddenly fell ill and did not report to work for two weeks in the middle of a test case execution cycle. In this case, Kelum and the rest of the team had to work long hours to meet the deadline of the execution cycle.

- a. What are the project and product risks associated with the above example?
- b. What are the four steps of risk management in the software development process? Discuss.

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

III.

- a. Describe why performance testing is important for a web application.
- b. Briefly describe the following performance test types:
 - i. Load test
 - ii. Stress test
 - iii. Scalability test

