



THE OPEN UNIVERSITY OF SRI LANKA
BACHELOR OF SOFTWARE ENGINEERING – LEVEL 05
DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
ECI 5267 – SOFTWARE TESTING AND QUALITY ASSURANCE

FINAL EXAMINATION – 2013 / 2014

Date: 11th, August 2014

Time: 0930-1230 hrs

<INSTRUCTIONS>

1. Answer **Question 1** in **Part A**, which is compulsory.
2. Answer **3 questions out of five** given in **Part B**.
3. This is a closed book exam and no reference books and materials are allowed.

PART A (Compulsory question – 40 marks)

Question 1

Read the given scenario and answer the questions.

SoftSolutions is a software solutions company providing software design, programming, and testing to Sri Lankan clients. The company has a qualified and experienced software development and software testing teams that can provide resources to various projects currently being developed. SoftSolutions is proud to have an overall quality assurance team that overlooks all the projects across the company.

Assume that you are a member of a QA team assigned to test a web based application developed for an insurance company. There are number of features implemented in this application such as online registration, online payments etc. and your team is assigned to test the client registration page.

Part of the Functionality expected:

- *Validate the user inputs and allow only entering client NIC number and client's age.*
- *Once the user entered the NIC number correctly, the system will display the fields to enter client name, address and allow the user to select an insurance policy from a drop down list.*
- *The drop down list will comprise of all the insurance policies available*
- *When the details are entered completely a message will be prompted saying "Personal data are added successfully".*
- *NIC and age fields should not be empty.*

(You may make realistic assumptions when answering this question, but all assumptions needs to be clearly stated in the document)

- a) State two test case design techniques you would use to write the test cases for **age** field.
(2 Marks)
- b) State two advantages of using the test case design techniques mentioned in part (a) above.
(4 Marks)

- c) What would be the test cases that you are writing if QA lead asks you to write five test cases to cover the most critical scenarios from the given page? *(3 Marks x 5 = 15 Marks)*

(Note: When writing test case use the table format with, *Test Case no, Type (UI/Fun), Prerequisites, Description, Steps and details, Test Data, Expected Output, Execution Status*)

- d) Age will be entered to a text box range from 0 to 120. What is the count of the minimum number of test cases using equivalence partitioning to test this scenario adequately. List the test conditions of those test cases. *(6 Marks)*
- e) QA lead asks you why each developer could not assure the quality of the product without having a separate QA team. State three reasons for having a separate QA team for the project. *(6 Marks)*
- f) List four advantages of automated testing. *(4 marks)*
- g) SoftSolutions is planning to improve their client base by becoming a certified organization. List down three quality standards you would suggest to the company leadership to introduce a proper quality process which can be used throughout the SDLC? *(3 Marks)*

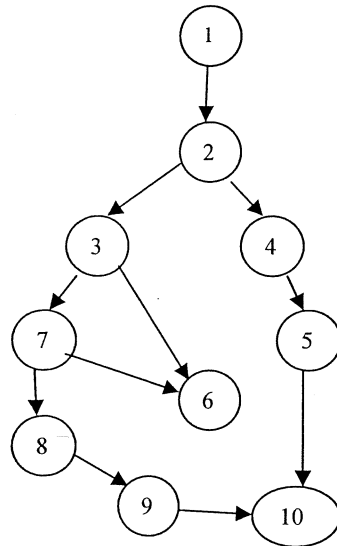
PART B (Answer 3 questions only, each question carries 20 marks)

Question 2

- a) Write down the different states a typical defect will have. Explain each state in detail. *(5 marks)*
- b) While testing an application a user got an error saying 'Getting HTTP 500 Time out error while trying to display values into list box'.
- i. Write a defect report for the above defect *(4 marks)*
 - ii. Identify the severity and priority for the same. *(1 marks)*
- c) Explain the difference between priority and severity levels in a defect. *(3 marks)*
- d) Give an example for a defect having the following priority and severity levels. *(4 marks)*
- i. Priority and severity high
 - ii. Priority and severity low
 - iii. Priority high and severity low
 - iv. Priority low and severity high
- e) What will be the severity and priority of the defect if the 'welcome message' and the 'search' buttons are missing in the screen? Justify your answer. *(3 marks)*

Question 3

- a) What is Cyclomatic complexity? Calculate the Cyclomatic complexity for the flow graph given below. (6 marks)



- b) Explain why this value called “Cyclomatic complexity” is important to testers. (2 marks)
- c) From your own testing experience and what you have learned during the course unit, why do you think it is important for a tester to use both white box and black box based testing to evaluate a given software module? (Describe using advantages and disadvantages) (10 marks)
- d) What is meant by code coverage analysis? (2 marks)

Question 4

- a) What is the process of evaluating software at the end of the software development process to ensure compliance with software requirements? (2 Marks)
- b) Briefly describe five test cases that can be included in acceptance testing. (10 Marks)
- c) What is static analysis? What type of errors can be identified using static analysis? (5 marks)
- d) Describe how static testing helps to reduce product quality issues. (3 marks)

Question 5

“Creative IT Solutions” is a service providing company. Recently they noted that the number of customer reported defects are getting high and the severity of those is high too. Due to these defects, the customer satisfaction was getting reduced and complains made against the systems delivered were in a critical situation. Hence the management decided to conduct a root cause analysis to find the reasons behind this. During the root cause analysis they found the following reasons for having a high number of customer reported defects.

- Competency on testing was lacking
- Test tools were not provided on time
- Business clarifications were not addressed on time
- Schedule or budget for testing was not enough

- a) What is a risk and how it differs from an issue? (2 marks)
- b) List and describe three risks associated to software development. (6 Marks)
- c) State 3 common ways to identify risks in testing and describe them. (6 Marks)
- d) State the 3 aspects of risk management and explain them in detail with regard to the above scenario. (6 Marks)

Question 6

- a) Why is adherence to software processes important? (5 marks)
- b) ISO/IEC 15504 provides a framework for process improvement and capability determination. How does ISO/IEC 15504 relate to CMM? (5 marks)
- c) If your software company is considering continuous improvement on process quality, what **quality model** would you recommend to your management? (2 Marks)
- d) How do you achieve continuous quality improvement according to your answer for (c)? (5 marks)
- e) Six-sigma is a manufacturing oriented process model. How do you measure sigma levels of a given process? (3 marks)