

FINAL EXAMINATION 2009/2010
BACHELOR OF SOFTWARE ENGINEERING



ECI 5267 Software Testing and QA

Date: 26th May 2010

Time: 9.30 – 12.30 hrs

Answer **BOTH** question in Part A and any 2 questions from Part B

<INSTRUCTIONS>

1. This examination paper has only Essay Type Questions.
2. There are 6 subjective questions. Section 1 has **mandatory** questions and Section 2 has optional questions.
3. Answer **both** Q1 & Q2 in Section 1. Answer **2** questions out of 4 in Section 2.
4. This is a closed book exam and no reference books and materials are allowed.

Part A

The following two questions are **Mandatory**. Answer **both** questions. This section will provide you 50 marks in total. The marks belonging to each part is given separately.

1) Consider the following scenario.

Eurosoftware is an IT firm which is developing a new application for an international NGO called DPM (Disabled Peoples Movement). DPM is an organization which consists of disabled people from various countries (e.g. UK, US, France, Germany, Japan, Sri Lanka etc.) in the world, who reach out to assist less privileged disabled people around the globe. DPM has provided an approved business requirement document to Eurosoftware. According to the requirements, the specific client/server application will be accessed by about 20 - 30 (i.e. the maximum no.) heads/managers of DPM offices in different geographic locations / countries with around 5 - 8 concurrent users. The application will be accessed using the local language in different countries. The application would be storing information in an Oracle database. The development of the new application would NOT be using iterative phases / builds.

Some test types which can be used to test the above is as follows:

- Functional Testing
- Regression Testing
- Integration Testing
- Acceptance Testing
- Performance Testing
- Security Testing
- Internationalization Testing
- Usability Testing
- Accessibility Testing
- Ad hoc Testing

- a) State the definition for each of the above test types. (10 Marks)
- b) State what are the **4 most important Test types** out of the above that Eurosoftware should select to test the client/server application as per the available information and **provide reasons** for selecting them. (8 Marks)
- c) Justify your answer providing reasons for **NOT selecting the other remaining 6 test types** for the given scenario. (12 Marks)
(30 Marks)

2) Write the correct answers (*i.e. Answers should be one line answers*) for the following questions:

- a) What is the type of testing conducted based on an analysis of the specification of a piece of software without reference to its internal workings?
(2 Marks)
- b) What is the process of evaluating a system or component to determine whether or not the products of a given phase satisfy the conditions imposed at the start of that phase?
(2 Marks)
- c) What is the process of operating a system or component under specified conditions, observing or recording the results, and making an evaluation of some aspect of the system or component?
(2 Marks)
- d) What is the process of evaluating software at the end of the software development process to ensure compliance with software requirements?
(2 Marks)
- e) A synonym (*i.e. another similar word that can be interchanged in this context*) for White Box Testing is, what sort of box testing?
(2 Marks)
- f) As per your understanding on views of quality, the perspective of the organization (that may be external to the producer's company, such as an independent vendor) that provides either the producer and/or the provider with products and services needed to meet the requirements of the customer, is called what view of quality?
(2 Marks)
- g) What is the statement which is usually defined during requirements analysis and states what the test team or tester is expected to accomplish during a specific testing activity. (*hint: normally this statement is also included in the Test plan*)
(2 Marks)
- h) Should Exhaustive testing be conducted for applications such as air traffic control or defence systems?
(2 Marks)
- i) To facilitate the software testing process, a detailed procedure that fully tests a feature or an aspect of a feature is used. What is this procedure called?
(2 Marks)
- j) In rapid prototyping, there are usually two basic approaches to design systems being used. Which approach is being used for situations wherein the prototype is first built based on the current stage of the design and then tested on a control group with the results being used to integrate into the next stage of development in order to further enhance and improve on the usefulness of the current design?
(2 Marks)

(20 Marks)

Part B

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Answer **TWO** questions out of the following four questions. (e.g. Q3, Q4, Q5, Q6) This section will provide you 50 marks in total. The marks belonging to each part is given separately.

3)

A. A GUI application is used to get the user inputs to register a new member for a cricket team in IPL. The user has to enter the age in one of the text boxes. Following are the requirements.

- Age of the applicant should be between 18 and 35.
- The text box should allow only numeric values.

a. State 3 advantages you will get by using Black box testing (3 Marks)

b. State 3 techniques that you can use to generate test scenarios for effectively testing this text box (3 Marks)

c. Write down 9 test cases to test this text box. (9 Marks)

B. Explain the following with some examples.

a. Root Cause Analysis
(2 Marks)

b. Run Charts
(2 Marks)

c. Control Charts
(2 Marks)

d. Capable Process
(2 Marks)

e. PDCA
(2 Marks)

(25 Marks)

4) Software Solutions is a service providing company which has missed several software release deadlines recently and the client's have expressed their dissatisfaction over this. The management has decided to find out the reasons for not being able to keep to client deadlines and wants to take immediate action in order to prevent this from happening again. During the root cause analysis they found following reasons for missing deadlines.

- Delay in getting the test data
- Developers delay in their releases to QA
- Business clarifications are not addressed on time

a) What is a risk and how it differs from an issue? (3 Marks)

b) State 3 common ways to identify risks in testing and describe them. (6 Marks)

c) State 6 common risks encountered in testing projects (6 Marks)

d) State the 4 aspects of risk management and explain them in detail with regard to the above scenario.
(10 Marks)

(25 Marks)

5)

- I. "When there are two separate teams in a project for development and testing tasks, the quality of the product will increase".
- Do you agree with the above statement? Give reasons for your answer? (3 Marks)
 - What is "Testing" and why do we test a product/service? (3 Marks)
- II. Your project manager asked you to draft a Test Plan for you project and asked you to present it to the team in three days.
- According to IEEE 829-1998, name 5 key areas you have to consider in a test plan. (5 Marks)
 - Briefly explain the above stated areas (5 Marks)
- III. "How many defects did you find within this week and what component produced the highest number of defects?"
This is a common question a Project Manager can ask from a Test team. The Test team needs to have Metrics to answer the above question.
- What is a Test Metric? (2 Marks)
 - Why do we need Metrics in testing? Give two reasons? (2 Marks)
- IV. "Testing is endless. We cannot test till all the defects are removed."
Is the above statement correct? State four factors used to decide, when to stop testing. (5 Marks)

(25 Marks)

- 6) WarZone-T10 is a web based game. This software needs to be installed using a CD and a special device needs to be connected to the computer to play the game. WarZone-T10 supports multiple operating systems / browsers (i.e. supports all the popular operating systems such as Windows XP, Linux, Windows Vista etc. and browsers such as Firefox, IE 6.0 & above etc.) and the common screen resolutions. The game function by capturing screen objects and when it is connected to the WarZone.com web site after the software installation, the game will be updated automatically. WarZone-T10 could be played with multiple users across locations connected through the internet and is targeted for the UK, US and SL markets. Also note that the product will be delivered to the customer in 4 client releases. As a Test Lead, employed for the firm in charge of the development of this product, answer the following questions.
- In the given scenario, what are the 4 main aspects of the product that needs to be focused for testing thoroughly? (4 Marks)
 - Mention the 3 most important non functional testing types that can be carried out for the WarZone-T10 product? (6 Marks)
 - Out of the above non functional testing, describe one and state some test tools if available for the selected testing. (5 Marks)
 - Due to time/budget constraints you will not be able to able to cover all the operating systems / browsers etc. How will you identify the required test coverage? Discuss. (5 Marks)
 - If you are to release the WarZone-T10 product to production environment from QA for UAT, what features or aspects (as in Q6-[a]) needs to be rolled out first. Discuss. (5 Marks)

(25 Marks)