00615

The Open University of Sri Lanka
Faculty of Engineering Technology
Department of Electrical & Computer Engineering

Study Programme	: Bachelor of Software Engineering Honours
Name of the Examination	: Final Examination
Course Code and Title	**: EEI5467 Software Testing and Quality Assurance**
Academic Year	: 2022/2023
Date	: 20th May 2023
Time	: 0930 -1230hrs
Duration	: **3 hours**

General Instructions

1. This examination paper has five (5) Questions.
2. Answer all five (5) questions.
3. This is a closed book exam, and no reference books and materials are allowed.

Question 1 (20 Marks)

Consider the following scenario.

ITPro is an IT firm which is developing a new application for an international NGO called Rapid Disaster Relief (RDR). RDR is an organization which consists of volunteers in Social Service from various countries (e.g., India, Singapore, Japan, Sri Lanka etc.) in Asia, who reach out to assist a member country facing a natural disaster. RDR has provided an approved business requirement document to ITPro. According to the requirements, the specific client/server application will be accessed by about 100 - 200 (i.e., the maximum no.) managers of RDR offices in different geographic locations/countries with around 1000 - 2000 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 what are the **4 most important Test types** out of the above that ITPro should select to test the client/server application as per the available information and **provide reasons** for selecting them. *(8 Marks)*

b) Justify your answer providing reasons for **NOT selecting the other remaining 6 test types** for the given scenario. *(12 Marks)*

Question 2 (20 Marks)

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 software at the end of the software development process to ensure compliance with software requirements? *(2 Marks)*

c) "*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.

i. What is a Test Metric? *(2 Marks)*

ii. Why do we need Metrics in testing? Give one reason. *(2 Marks)*

d) State 2 different views of quality and explain them with examples. *(5 Marks)*

e) What is the difference between Sprint Review Meeting and Sprint Retrospective meeting? who are the participants in each meeting? *(2 Marks)*

f) Draw the Agile Testing quadrant and give at least one sample testing type in each of the quadrants. *(5 Marks)*

Question 3 (16 Marks)

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 2 techniques that you can use to generate test scenarios for effectively testing this text box. *(2 Marks)*

c. Why is it necessary to develop test cases for both valid and invalid input conditions? *(2 Marks)*

d. Write down 9 test cases to test this text box. (Test cases must be written in Test case format) *(9 Marks)*

Question 4 (24 Marks)

Sri Lanka IT consultants which is a service providing company which has missed several software release deadlines recently and the clients 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. *(3 Marks)*

c) Give 3 examples each for project risks and product risks *(6 Marks)*

d) 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)*

e) What does the term "Six Sigma" stand for? You are working as a CMM/CMMI consultant and found that six sigma may complement CMMI level 4 and level 5 implementations. Would you agree? Discuss. *(3 Marks)*

f) What benefits does a Six Sigma deployment offer a small or medium-size company? How does the deployment differ from a larger company? *(4 Marks)*

Question 5 (20 Marks)

Call of Duty Asia is a web-based game. It supports multiple operating systems and browsers (i.e., supports all the popular operating systems such as Windows, Linux, Apple Macintosh etc. and browsers such as Google Chrome, Firefox, etc.) and the common screen resolutions. The game function by capturing screen objects and when it is connected to the Call of Duty Asia web site after the software installation, the game will be updated automatically. Call of Duty Asia could be played with multiple users across locations connected through the internet and is targeted for the India, Maldives 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.

a) In the given scenario, what are the 4 main aspects of the product that needs to be focused for testing thoroughly? *(6 Marks)*

b) Briefly explain the 3 most important non-functional testing types that can be carried out for the Call of Duty Asia product? *(6 Marks)*

c) 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. *(2 Marks)*

d) List down 2 automation tools to automate a web/mobile based application like the one given above. *(2 Marks)*

e) As a tester you are requested write the code in Selenium to test a login page with User ID and Password to carry out automated testing. Please fill the blanks in the given script.
(*4 Marks*)

```
// Launch the web browser and navigate to the login page
driver = ____(a)_____.Chrome();
driver. ___(b)___("https://example.com/login");

// Find the username and password input fields and fill them in
username_input = driver.____(c)_____("__(d)_____");
password_input = driver.find_element_by_name("___(e)____");
username_input. ___(f)____("my_username");
password_input. ____(g)____("my_password");

// Click the login button
login_button = driver. __(h)___("//button[text()='Login']");
login_button.__(i)__;

// Verify that the user is logged in by checking for a specific element on the page
welcome_message = driver.find_element_by_xpath("//h1[text()='Welcome']")
assert welcome_message.is_displayed()

// Close the web browser
driver.___(j)___
```