Sri Lanka Institute of Information Technology

B.Sc. Honours Degree in Information Technology

Final Examination
Year 1, Semester 2 (2019)

IT 1060 - Software Process Modeling

Duration: 2 Hours

October 2019

Instructions to Candidates:

- This paper is preceded by 10 minutes reading period. The supervisor will indicate when answering may commence.
- This paper has 3 questions. Answer all questions.
- Write answers in the booklet given.
- Total marks 100.
- This paper contains 5 pages including the cover page.
- Electronic devices capable of storing and retrieving text, including calculators and mobile phones are not allowed.

Question 1 (40 Marks)

Analyze the scenario given below and answer the subsequent questions. **State any assumptions made.**

As a software engineer, you are asked to come up with the requirements for SL HOMES which will help the house owners in selling their properties.

When a House Owner (HO) wants to sell his property (house) he gives details of his house. These details can be given either through an e-mail, through SL HOMES website or through an online chatbot. Once the system receives the details, those details will be updated in SL HOMES database.

The Marketing Executive (ME) is responsible for advertising homes. As the first step, he will prepare an online contract for the customer. The HO must sign the contract and upload it to the system. Once the contract is complete, the next step is to prepare the marketing materials. The marketing material can be either a video, a leaflet, a mail or a combination of those. The materials should be approved by the HO. If the HO is not happy with the materials, ME has to update the materials till the HO is satisfied. Once the marketing material is prepared, ME can advertise the house in the SL HOMES website, through mail or through social media. SL HOMES uses Facebook, Twitter and Whatsapp for their social media advertising.

Marketing Manager (MM) is responsible for approving the advertisement. When approving the advertisement, MM must first review and approve the content (text, images, video). Then he has to approve the budget. SL HOMES system will calculate the budget. In calculating the budget, system will calculate the commission to be charged from the HO. If the house price is expected to be more than 20 Million, a 10% discount will be given on the commission. As ME is a part time worker, sometimes MM is responsible to complete any pending urgent work of ME.

a. Draw a Use Case Diagram for SL HOMES stating appropriate assumptions.

(30 marks)

b. Write **two** User Stories for the SL HOMES system.

(6 marks)

c. Compare and contrast **User Stories** and **Use Case Diagrams** by giving one similarity and one difference.

(4 marks)

Question2 (35 Marks)

a. Explain the importance of **"3C's"** in User Stories.

(06 marks)

b. "*Non-functional requirements are **not** critical when developing a software system*".

i. Do you agree with the above statement?

ii. Justify your answer given in b)-i. using an example.

(04 marks)

c. Draw an Activity Diagram **with swim lanes** for the "Online Banking" process of the X Banking System (XBS) as given below.

XBS allows customers to do online banking. XBS consists of three subsystems. User Manager Subsystem (UMSS), Account Manager Subsystem (AMSS) and Response Manager Subsystem (RMSS). UMSS handles user/customer related actions. AMSS is responsible for bank account related actions. RMSS handles responses to the user such as error messages.
Once a customer enters his login details, those details will be validated. If the login details are incorrect, customer will be asked to re-enter the login details for three times. If the login details are incorrect for the third time, the user id will be locked and the bank accounts also will be locked. Then a warning message will be sent to the customer phone and mail. A message will be shown on screen informing the user that his accounts are locked.

When the customer is successfully validated, he will be shown a menu of eligible tasks. A customer can do three main tasks. The customer can Transfer Money from his bank accounts. He can Edit Profile. In addition, he can select View Statement option. When he selects the View Statement option, the customer has to choose the month and the bank account for which he wants the statement. Once he selects those, the system will generate the monthly account report and the report will be displayed through the system.

Once the customer selected action is completed, the system will show the eligible task list again. If the customer wants, he can repeat any of the three actions Transfer Money, Edit Profile and view statement. Once he has completed the actions he needed to perform, customer will logout from the system.

You can assume that Transfer Money and Edit Profile tasks are already given as separate activity diagrams.

(25 marks)

Question 3 (25 marks)

a. Write the most suitable word(s)/phrase for the blanks of the statements given below.

i. **Black box testing** is also known as .....

ii. One of the aims in **software design modeling** is .....

iii. **Prototype** SDLC model replaces the .....
of the **Waterfall** SDLC model with a .....

iv. In **Agile Manifesto,** ..... are valued over processes and tools.

(05 marks)

b. SLIIT has come up with a program to convert the final exam marks to grades. Following table gives the criteria for deciding the grade.

Minimum Mark	Grade
90	A+
80	A
70	B
60	C
50	D

Marks below 50 will be graded as F, meaning Failure. Marks should be entered to one decimal point (for example, 45.4).

i. Draw a diagram showing equivalence partitions and boundary values that ensure all input values are tested

(06 marks)

ii. How many test cases are required for complete coverage? Justify your answer.

(02 marks)

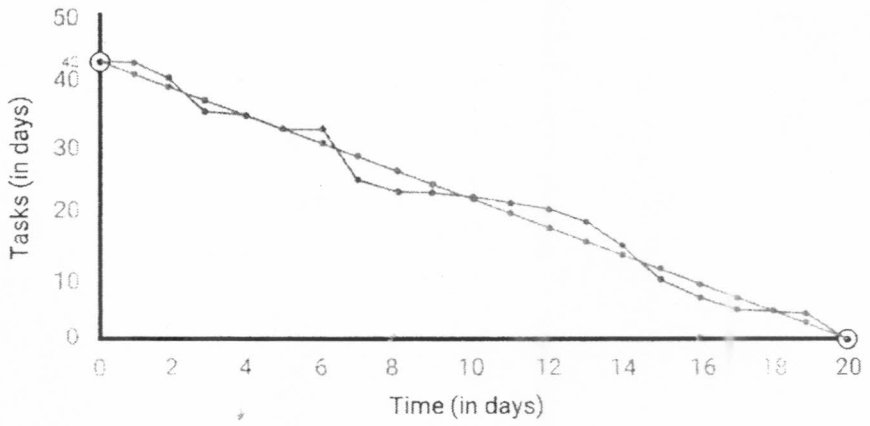
iii. Write sample inputs for **four** test cases with the expected results.

(04 marks)

c. *"**Free and Open Source Software**" is different from "**Open Source Software**"*. Give your comments on this statement.

(03 marks)

d. A SCRUM team has completed a project and their Burn-down Chart is given below.



i. Calculate the expected **Burn-down Velocity.**

(02 marks)

ii. Comment on the actual team performance in terms of **Burn-down Velocity**.

(03 marks)

********** **End of Exam Paper** **********