Sri Lanka Institute of Information Technology

B.Sc. Honours Degree in Information Technology

Final Examination
Year 1, Semester 2 (2018)

IT 1060 - Software Process Modeling

Duration: 2 Hours

October 2018

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 4 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.

The management of SETHMAL, a leading pharmacy has decided to install a Pharmaceutical System (PS) to serve their customers better.

Customers handover their prescription to the pharmacy assistant (PA). Based on the prescription, PA will enter the required amount of clinical, non-clinical and medicine items. The PS will check the availability of the uploaded items. If the requested items are not in store, out of stock or expired, the system will automatically generate a message to the pharmacy manager (PM) and the store manager (SM) to check the stores or to order and restore a healthy stock level in store. If the items are available in store the system would display the shelf number and all its details to the PAs. After the PA creates the required packet of clinical items the system will send a message to the cashier with all the details of the items in the packet to prepare the bill.

At the cashier, the system will calculate the bill according to the dosage and the amount. Before settling the bill the cashier would enter the customer details into the system. If he/she is a regular customer or a senior citizen 10% of the bill will be waived off. The cashier can settle the payment through card or cash depending on customer's choice.

The SM has the responsibility of keeping a healthy stock level of items. When the stock level needs to be restored the SM would place an order. This order should be approved by the PM before sending to the suppliers. The suppliers will deliver the goods within one week of the approved order placement. Once the stock is received at the stores, the SM will update the stock levels and price variances and a message will be sent through the system to the PM which would include all the details. The system would generate a report on the order placed, the delivered goods details and any variations. After analyzing this report, PM will approve the payment and the PS would send a notification to the Finance Department to pay the bill. For proper maintenance of the system, PM is given access rights for all the processes within the PS.

PS will generate several reports monthly, daily and upon request by the PM. The daily reports include daily income sheets, staff time sheets and the pending payment report. Monthly reports include staff salary payment report, staff leave report and monthly income report. All these reports will be analyzed by PM to make SETHMAL a better pharmacy.

a) Write **two non-functional requirements** for PS given above.

(02 marks)

b) State reasons for selecting the non-functional requirements in **part a)** above.

(08 marks)

c) Draw a Use Case Diagram for PS stating appropriate assumptions.

(30 marks)

Question2 (30 Marks)

a) Briefly explain the **objectives** of using a modeling language for Software Design.

(04 marks)

b) "*Ethnographic studies have shown that work is usually richer and more complex than suggested by simple system models*".

Do you agree with the above statement? Briefly explain why **Ethnography** is important in Software Process Modeling.

(03 marks)

c) Compare **V-Model** to **Classical Waterfall Model**.

(03 marks)

d) Draw an **Activity Diagram with swim lanes** for the "Place Order" process of the Taste Buds Catering System (TBCS) given below.

To place a food order through TBCS, a customer has to login to the TBCS system. Once logged in, the customer initiates the ordering process by providing the food details including the quantities for the order. Then TBCS will calculate the total amount for the order and display it to the customer. If the customer is a registered customer, he will be given a discount from the total bill amount depending on how many orders he has placed during the month. Then the discounted amount will be displayed to the customer. If the customer is willing to place the order, he/she will make the payment online via credit or debit card. Once the customer enters and submit the card details, the system will validate those details. If the validation process is unsuccessful, the system will notify the customer and will ask the customer to re-enter the payment details. If the validation is successful, the order details will be sent to the Restaurant Manager for approval. Once approved, a unique order number is generated and displayed to the customer. Then the order is assigned with "New Order" status. Meanwhile the system generates a digital receipt and sends it to the customer via e-mail. Once all these tasks are successfully executed, the system will generate an "Order Placed Successfully" message which would be shown to the customer.

(20 marks)

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Question 3 (30 marks)

a) Compare **Sprint Planning Meeting** and **Sprint Retrospective Meeting**.

(04 marks)

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

    i.   **White Box Testing** techniques are also classified as ....

    ii.   **Alpha Testing** is a type of .... testing technique.

    iii.   .... testing in Software Testing Life Cycle is mapped to .... phase in Software Development Life Cycle.

    iv.   **Unit Testing** is performed by ....

(08 marks)

c) A SCRUM Team is asked to complete a task worth of 30 man hours within 10 days. Analyze the work performance table of the team given below and comment on their performance in terms of Burn-down Velocity.

Day	0	1	2	3	4	5	6	7	8	9
Remaining work (man hours)	30	27	26	25	20	15	13	7	3	0

(08 marks)

d) At SLIIT, the System Administrator has decided to create a password strength meter that shall indicate the strength of a password. The password strength meter checks that passwords have at least 8 characters, contain alpha numeric and special characters, and contain both upper-case and lower-case letters.

Write 10 sample test data to check the **format of the password through** password strength meter using Black Box Testing. Use the format given below.

Sample Value	Expected Test Result

(10 marks)

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

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