Sri Lanka Institute of Information Technology

B.Sc. Special Honours Degree/ Diploma

in

Information Technology

Final Examination

Year 1, Semester 2 (2018)

IT 1060 - Software Process Modeling

Duration: 2 Hours

June 2018

Instructions to Candidates:

1. This paper contains **3** Essay Type Questions with different mark allocations.
2. **Answer All** Questions.
3. Total Marks: 100.
4. This paper contains 5 pages with Cover Page.

Question 1 (45 marks)

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

Government of Sri Lanka (GoSL) is planning to install a Satellite based Navigation System (SNS) to Sri Lanka. As an initial step, GoSL has consulted you to identify the requirements of SNS. Following are some of the requirements you have gathered from different stakeholders.

The General User (GU) is a citizen of Sri Lanka who can use SNS for his daily needs. A GU can use SNS to find his current location. Once the GU selects his destination SNS will show the different routes to the destination marked on a map. SNS will also select the best route based on the distance and traffic congestion and mark it on the map. If needed, GU can request the SNS to show the traffic congestion with different colours on the map.

When travelling, SNS will guide the GU about his trip. SNS will mark various information on the map for the user. These information include computing the current speed of the user, the distance to travel more and showing the important milestones on the route. If the GU wants, he can request the SNS to compute the average speed for the trip and mark that on the map. The GU is also given the option to use the voice guidance in SNS. If the voice guidance is selected, SNS will read out the information shown on the map such as the current speed he is travelling, traffic alerts, where to turn and other information.

SNS also has the facility to generate reports on the places user has travelled, routes he has taken, average speed for each trip and the distance he has travelled for a given time duration. The GU can set the time duration of the report for a week, fortnight, month or a number of months.

a) Indicate the **two** most important **non-functional requirements** for SNS given above.
(5 marks)

b) Justify your answer to **part a)** above with reasons for selecting the non-functional requirements.
(10 marks)

c) Draw a Use Case Diagram for SNS.
(30 marks)

Question2 (30 marks)

a) Write **two** features of a Software Process Model.

(2 marks)

b) "*Software is not just a set of programs*". Give **three** reasons to justify the statement.

(3 marks)

c) Draw an **Activity Diagram with swim lanes** for the SLIIT Surveillance System (SSS) configuration process given below.

SSS is used to monitor different access points to SLIIT. The SSS camera installation is done by a company named OWL. While OWL officer is installing the cameras, the System Admin (SA) sets up the recording devices and monitors for a list of authorized SLIIT staff members. Once the cameras are installed and the devices are all set, the SA grants access rights to the authorized SLIIT staff members. The authorized SLIIT staff member (ASM) enters user name and password to use the SSS. The user name and password will be validated by SSS and if incorrect for more than three times, the system automatically gets locked. If the SSS gets locked, ASM can request the Director Administration (DA) to unlock SSS with a reasonable justification. If DA approves the request, SA grants access again with a new user name and a password. Initially an ASM can select up to a maximum of three access points to monitor. Once the ASM chooses his desired access points he is given the option to choose the following features,

- how frequently SSS should generate the report (hourly/daily/monthly…)
- how the alarm should be set
- how the notifications should be given (mail/SMS/…..)

Once all the options are selected, ASM is able to view the camera output in a labeled window.

(25 marks)

Question 3 (25 marks)

a) Briefly explain the importance of modeling in designing software systems. Take a modeling language as an example.

(6 marks)

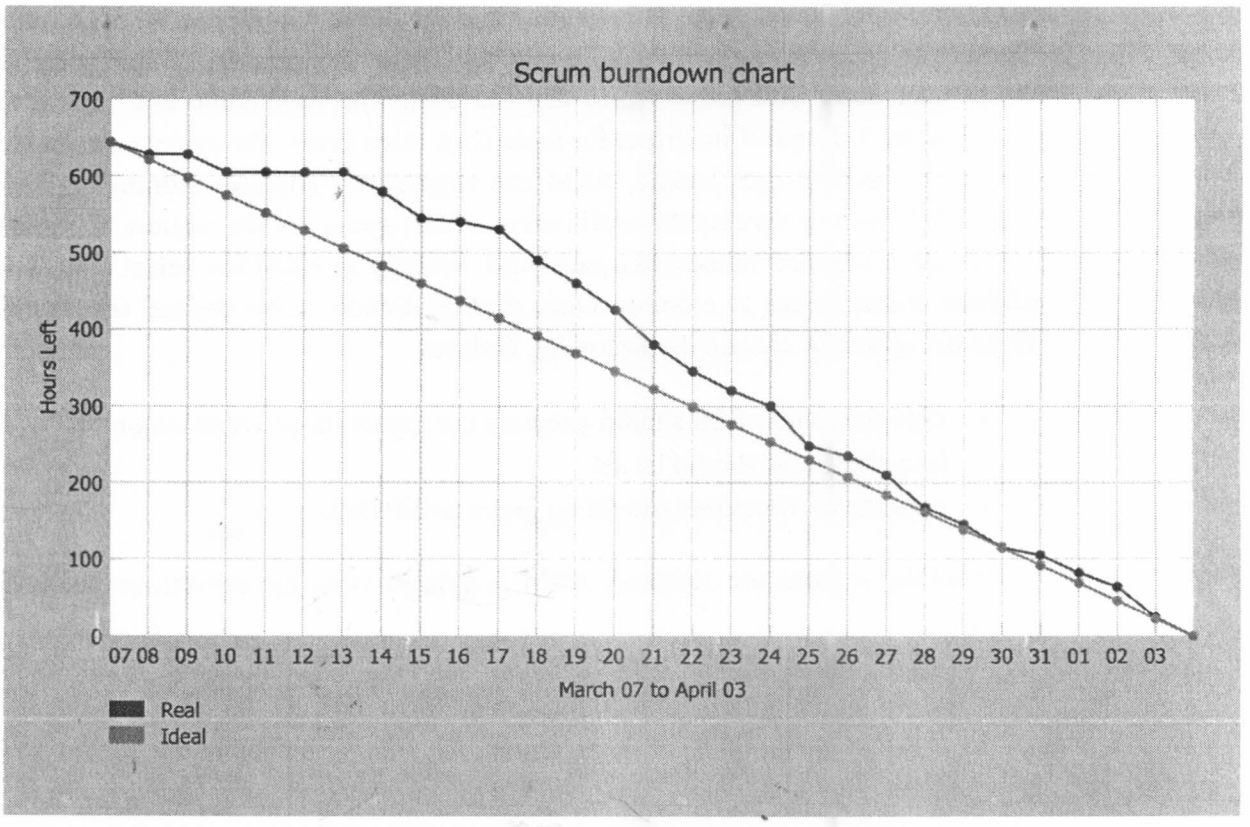
b) Given below is a SCRUM Burn Down chart. Analyze the chart and give your comments on the SCRUM team performance for the time periods given below.

i. 10th March to 13th March

ii. 17th March to 25th March

iii. 28th March to 3rd April

(6 marks)



c) Explain Round Trip Engineering related to Software Implementation with an example.

(3 marks)

d) An online Supermarket system lets users order dry rations such as sugar, flour, and dhal through the system. The user has to enter the name of the dry ration and the amount in Kilograms separated by a comma, for example "Sugar, 3". The maximum number of Kilograms allowed for one type of dry ration for a single order is 10. The system interface shows multiple text boxes for the user to enter different types of dry rations.
Write all the sample test data to check the **format and the correctness of the user entered data** to the above system using Equivalence Partitioning and Boundary Value Analysis. Use the format given below.

Sample Values	Expected Test Result

(10 marks)

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