Sri Lanka Institute of Information Technology

B.Sc. Special Honours Degree/ Diploma

in

Information Technology

Final Examination

Year 1, Semester 2 (2017)

IT 1060 - Software Process Modeling

Duration: 2 Hours

November 2017

Instructions to Candidates:

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

Question 1 (50 marks)

Analyze the scenario given below and answer the subsequent questions.

"1990" is an ambulance service initiated by the government of Sri Lanka. People who meet with road accidents, heart and kidney issues and any other emergency can call the number 1990 and request for an ambulance. There will be no call charge for this service. A call center handles all the requests coming through 1990 with a software system called Ambulance Request Handler (ARH). The process of handling such requests is given below.

When a person calls through "1990", a Call Center Agent (CCA) receives the call. The CCA requests the details from the caller and enters the details into the system forms. The details include name, address, phone number and the incident. Once CCA enters these details to the ARH system, the system will send the address details to an external system called Address Locator. The Address Locator will verify the address and the route to the address will be sent back to the ARH system.

Once the Address Locator finds the route details, the ARH system scans the surrounding area and finds all the ambulances close by. For the ambulances found, ARH then checks whether they are available or whether they are already allocated. From the available ambulances, the nearest ambulance is chosen.

If the ARH system could not find an available ambulance within three minutes of the time the route details are received, the incident details will be sent to a private ambulance service. The details of this service will be given to the customer.

After allocating the nearest ambulance, ARH system will process the following tasks concurrently.

- Send allocation information containing name, address, phone number and the incident to the ambulance driver as a text message.
- Update the selected ambulance status in the system as allocated.

Then ARH system tracks the ambulance using GPS. Tracking the system will be continued till the ambulance reaches the destination. Once the ambulance reaches the destination, the CCA will notify the customer.

a) Write **two** of the most important **non-functional requirements** for the ARH System given above.

(5 marks)

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

(10 marks)

a) Draw an Activity Diagram for the above scenario.
(Include all the relevant Action, Decision & Merge and Fork & Join nodes and any other relevant details.)

(35 marks)

Question2 (25 marks)

a) Compare **Agile** and **Classical Waterfall** SDLC models by giving **one** advantage and **one** disadvantage over the other in the following format.

(8 marks)

	Advantage	Disadvantage
Agile Model		
Classical Waterfall Model		

b) Write a **Use Case Scenario** for **withdrawing cash from ATM** for the case study given below.

XYZ bank has several automated teller machines (ATMs), which are connected via a wide area network to a central server. Each ATM machine has a card reader. By using the ATM machine, a customer can withdraw cash from either current or savings account. To withdraw cash, customer inserts their bank card into the card reader. Then he has to login with a given PIN. If the correct PIN is not entered within 3 attempts, the system confiscates the card.

When a valid PIN is entered, the customer can choose the account (current/savings). Then the system prompts for the amount to be withdrawn. If the account balance is less than the requested amount, the system will display an error message. Otherwise, the system dispenses the requested amount of cash to the customer and ejects the customer's bank card.

(17 marks)

Question 3 (25 marks)

a) List **three** objectives of Software Modeling.

(6 marks)

b) What is a **COTS** System? Write **one** advantage and **one** disadvantage of using COTS in building a software product.

(5 marks)

c) List out the artifacts of Scrum process

(4 marks)

d) Company ABC is going to provide their employees with a bonus which will be based on the employee's length of service in the company. The bonus calculation will be zero if they have been with the company for less than two years, 10% of their salary for more than or equal to two but less than five years, and 25% for five to ten years, 35% for ten years or more. The system interface will not allow a negative value to be taken as the length of service.

Write all the sample test data for the Length of Service in the format given below to test the above system using Black Box Testing.

Sample Value for "Length of Service"	Technique used

(10 marks)

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