



Sri Lanka Institute of Information Technology

B.Sc. Honours Degree in Information Technology

Final Examination
Year 1, Semester 2 (2022)

IT1060— Software Process Modeling

Duration: 02 Hours

November 2022

Instructions to Candidates:

- ◆ This paper has four questions.
- ◆ Answer all questions in the booklet given.
- ◆ The total marks for the paper are 100.
- ◆ This paper contains eight 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 case study given below and answer the questions given.



Environmental Relook

~Better Environment Better Tomorrow~

"Environmental Relook" (ER Services) is a famous garbage collection company that uses a web application as well as a mobile application in their daily operations. Any user who wants to improve their personal experience can register with the system. Each user must complete the registration form by providing their name, address, phone number, and the type of rubbish they will be disposing of. So, this information will be stored for further analysis. There are three different garbage type options: recyclable waste, organic waste, and plastic waste. Furthermore, each user must pay a yearly fee based on the type of rubbish to register with the system. So, either a credit card or an e-transfer can be used to make this payment.

Any registered user can check the garbage collection time and if that time slot is inconvenient for them, they can request a new time slot. Then system will suggest a new time slot with approval. So, Registered user can approve or reject it based on their availability. If the new time slots is also rejected, user must agree to skip the current week's garbage collection.

A registered user can also make a complaint regarding the process. So, these complaints are also categorized into two types, such as issues in process and issues with the driver. When making the complaint, each user needs to fill in the reasoning and only if they need to be removed from the ER services, they can request a refund. So, this refund process depends on the complaint and reasoning that the user has already filled in.

Furthermore, the driver can check the locations of weekly garbage collection and when checking the location system will calculate the shortest path and show it to the driver. So, driver has privilege to pick a location according to the shortest path. Also, once he has picked up a location, he can also calculate the estimated time for that location.

Moreover, ER services provide environmental friendly services for extra cost. Any registered user can register with the compost fertilizer generating services, and they can recycle the plastic items. When registering, the system will ask you to fill out a form to verify the amount of garbage from each location. Based on the amount of garbage and the location, the system will calculate the payment for the month. For long standing customers of ER system, system will provide free services for compost and recycling. Delivery of the fertilizer is handled by third-party delivery services. A third-party company also handles garbage recycling, and after recycling, they may pay an amount based on the garbage that customers provided.

So, in ER services registered user can perform all the activities that guest user can do.

a) Draw a Use Case Diagram with appropriate assumptions.

(35 Marks)

b) State two non-functional requirements which are applicable for the given scenario

(05 Marks)

Question 2 **(20 Marks)**

a) "FindMyPhD" is a world-famous web application that can be used to find PhD, Scholarships, and programs. It also owns world's largest database of PhD projects and programs that are available. So, FindMyPhD simply helps to find PhD opportunities easily through the website. Also, it allows prospective graduate students to apply for PhD programs through the system. Moreover, any user can register with the system and subscribe to know the latest opportunities and the scholarships. Any user can upload their profile to the FindMyPhD portal and System will rank the user according to academic and research qualifications and interests. On the other hand, any University can register with the system to find right students for their PhD programs. So, any Professor can search profiles according to the rank and find suitable candidates to the program.

I. Write two user stories considering FindMyPhD application.

(06 Marks)

II. Briefly explain two non-functional requirements related to the above system.

(04 Marks)

b) "Spiral is also known as a meta model." Do you agree? Justify your answer.

(04 Marks)

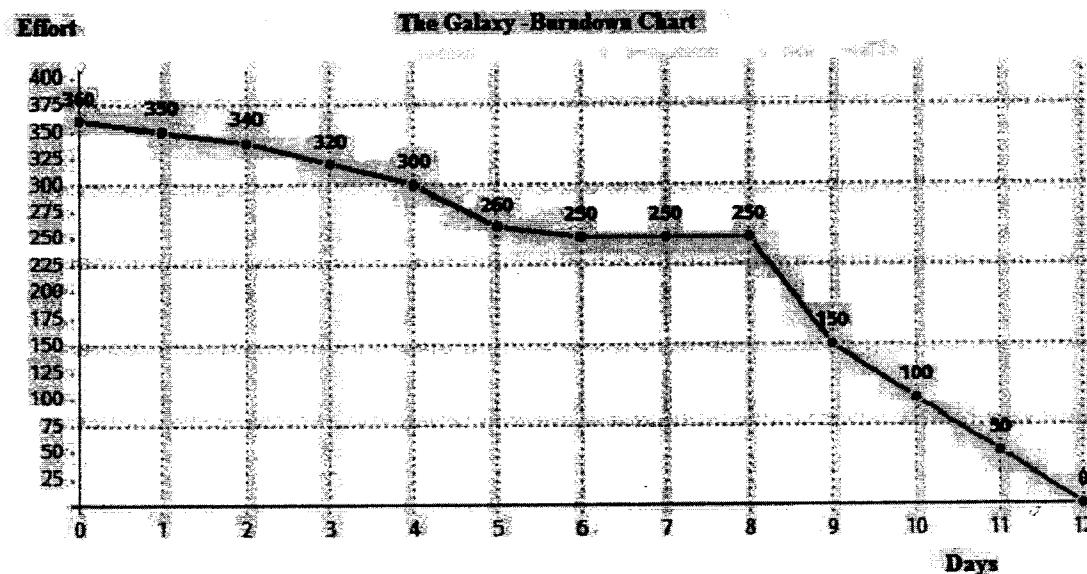
c) Compare and contrast Sprint Planning Meeting and Sprint Retrospective Meeting.

(06 Marks)

Question 3**(20 Marks)**

- a) The Galaxy is a novel project by the famous software company called "Wiley" by John Wiley & Sons. This project aims to provide a supportive system to elderly people who have dementia in low-income countries. As an initial stage team galaxy needs to gather the requirements from all stakeholders to identify the functional requirements. So, Galaxy decided to have a separate sprint for idnetify the functional requirements and drawn the sprint burn down chart as follows.

Moreover, Wiley is famous for practicing combinations of software development methodologies despite of the trends.



- I. Calculate the ideal burndown velocity for this sprint
(04 Marks)
- II. Suggest suitable software development methodology for this sprint and justify the answer?
(06 Marks)
- b) Write the most suitable word(s)/phrase for the blanks of the statements given below.
- I. SRS stands for ----- and it is the output of -----
--- Phase
 - II. ----- is the combination of **Forward** and **Reverse** engineering.
 - III. **Dynamic models represent the ----- of the system**
 - IV. Checking whether we ----- is called **Verification**

(10 Marks)

Question 4 (20 marks)

- a) Compare Software Development Life Cycle (SDLC) with Software Testing Life Cycle (STLC).

(06 Marks)

- b) Flinders University Australia wants to provide more information about scholarships that are available for international students. Therefore, University introduced a web-based application to search available scholarships. For these scholarships, Flinders University considers some criteria as follows. These scholarships are available for specific countries such as Sri Lanka, India, Thailand, and Malaysia.

Age of prospective students should be 30-34 (including 30 and 34)

Type should be graduate and undergraduate

Field of Study should be IT, SE, Data Science, Statistics and Actuarial Science (AC)

Cumulative GPA should be above 3.5

- a. Above 3.5: University Foundation Scholarship
- b. Above 3.75: South Australian National Scholarship
- c. Equal to 4.0: Australian National Scholarship

Scholarships and Awards	
Age	
GPA(Cumulative)	
Field of Study	
Type	
Country	
Search	

- I. Draw diagram/s showing equivalence partitions and boundary values that ensure all input values are tested for the system. Clearly mention the values.

(06 Marks)

- II. Write 10 Sample test data to check the format and the correctness of the user entered data to the above system. Use the below format

(08 Marks)

Age	GPA	Field of Study	Type	Country	Expected Output	Reason

~End of the Paper~