00901

Sri Lanka Institute of Information Technology

B.Sc. Honours Degree in Information Technology

Final Examination
Year 1, Semester 2 (2023)

IT1060– Software Process Modeling

Duration: 02 Hours

November 2023

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 is preceded by a 10-minute reading period. The supervisor will indicate when answering may commence.
- This paper contains seven 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)

"Be A Canadian (BeCA) "is a famous agent profile that supports students who seek foreign education in Canada. With the high demand of the current student community and strict rules and regulations in Canada, the enrollment process plays a vital part in the foreign education process. Therefore, Team BeCA needs a sophisticated system to process this enrollment.

Analyze the partial requirements of the" Be A Canadian "enrollment process (BeCA) and answer the subsequent questions given.

Any person can search for available universities by giving their age, current qualification, area of study, and study level. So, this search can be extended to the two types called High rank research universities and Technical Universities. In searching, if the user needs, the system will show the enrollment requirements. BeCA will keep track of information in their programs database and analyze for marketing purposes to identify popular universities and programs.

Students who seek enrollment for the very first time need to register with the BeCA by providing a valid passport number and their full name. with the registration system will perform validation process of the details given. If an invalid passport is identified, they reject the registration process. As a result of the registration, they will receive the CAN number.

Using the CAN number, area, and university, students can book a discussion with the agent profile, and the system will allocate counselors randomly based on the universities and counselors' expertise areas. Counselors may categorize into three types according to their expertise areas. They are IT, business, and science. Counselor can access the system and check the system scheduled appointments based on the workload. When checking the scheduled appointments, if any conflicts identified, counselor could reject appointment before 24hrs of the scheduled date. If less than 24hrs, the system reduces the counselor rank by 1. On the other hand, counselor can update the system while conducting the appointment. As a convention, the system increases the counselor rank by 1.

Once the discussion has been completed successfully, counselor can mark the completion of the appointment, preceding system request to submit the offer details to the system. If unsuccessful, counselor may fill in the reasoning form and recommendation. As a result, the system will show reasoning and recommendation to the student. Meantime, students can fill feedback form which is the last step of the appointment. So, this happens for both students who completed it as successful or unsuccessful.

Therefore, for successful discussions, students must enter all details for the offer, including the CAN number and request for the offer, through the system. Then the system will validate the details and send them to the third-party Uni portal called IMMI.gov.uk. For successful offers, they may send a successful notification and send the offer directly, and for unsuccessful offers, they may send a regret notification.

Please note that the student can do all the activities of the visitor, and the counselor can check all the activities of the student.

a) Draw a Use Case Diagram with appropriate assumptions.

(37 Marks)

b) Sate three non-functional requirements relevant to the given system

(03 Marks)

Question 2 (20 Marks)

a) "Unit testing is microscale testing, which is a white box testing type." Do you agree or disagree with this statement? Justify your answer.

(04 Marks)

b) What is round trip engineering?

(04 Marks)

c) "Modeling is an important task in the software development process." Do you agree with this statement? Justify your answer using four modeling aims.

(04 Marks)

d) "The iterative waterfall model is more improved than the classical waterfall model." Do you agree or disagree with this statement? Justify your answer.

(04 Marks)

e) What is the difference between static models and dynamic models? Explain your answer using some models that you have learnt.

(04 Marks)

Question 3 (20 Marks)

"SLIIT Extraza" is a newly introduced application for calculating additional points to the cumulative GPA based on extracurricular activities. So, this functionality considers extracurricular activities and adds additional points to the current cumulative GPA. Please note that additional points can be added to students who have a current GPA between 3.0 - 3.5.

"SLIIT Extraza" may consider both sports activities and technical-level competitions. So, for all the sports activities, including badminton, netball, and cricket, you may receive 0.25 for your participation. For winnings, first place may receive 1 point, second place and third place may receive 0.5. Therefore, a student can claim a maximum of 5 marks for the sport.

Competitions, including NBQSA, SLASSCOM, Eswabhimani, and Imagine Cup, may receive 0.5 for participation. For winnings, students may receive a maximum of 5 marks for the competition. Please consider the above partial requirement when answering the subsequent questions. Please note the following conditions:

- **Student ID consists of four digits, preceding the letter 'S/s'.**

  Ex: 1234S, 2345s

- **For one student ID, the system will accept many sports, competitions, or both.**

  Ex: S-Netball, C-NBQSA

- **For one student ID, the system will accept many winnings or participations.**

  Ex: P, W

- **Student GPA will be taken as one decimal point.**

  Ex: 3.0, 3.1, 2.9

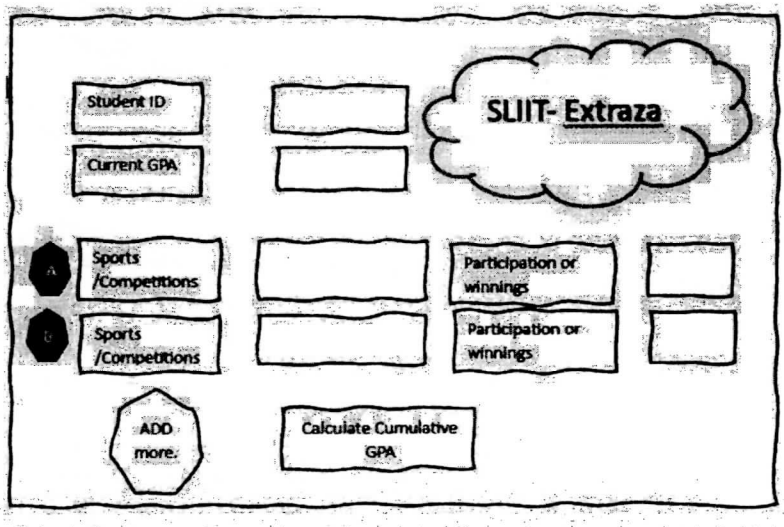

Figure01: Interface of SLIIT Extraza

a) 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.

(10 Marks)

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

Student ID	Current GPA	Sports /Competition: Participation/ winnings

(06 Marks)

c) Write down the differences between verification and validation.

(04 Marks)

Question 4 (20 Marks)

The following question is based on the modern development approaches. Read the given questions and write down the answers for Part A and Part B.

Part A

I. "Agile Development is more applicable to dynamic business industry than traditional software development." Do you agree or disagree? Justify your answer giving appropriate three reasons.

(06 Marks)

II. There are several types of meetings followed by the Scrum team during its development. List them and briefly explain the importance of them.

(04 Marks)

Part B

I. Draw the burn down chart for the given values and answer the subsequent questions.

(04 Marks)

Days	0	1	2	3	4	5	6	7	8	9	10
Workload-Man hours	845	800	750	650	600	550	460	400	300	150	0

II. Calculate Ideal burn-down velocity?

(02 Marks)

III. Maximum actual velocity was/were reported on ---------- day/s.

(02Marks)

IV. Minimum actual velocity was/were reported on ----------day/s.

(02Marks)

~End of the paper~