The Open University of Sri Lanka

Faculty of Engineering Technology

Department of Electrical and Computer Engineering

Study Programme	: Bachelor of Software Engineering Honours
Name of the Examination	: Final Examination
Course Code and Title	**: EEI4267 – Requirement Engineering**
Academic Year	: 2021/22
Date	: 19th November 2022
Time	: 0930-1230hrs
Duration	**: 3 hours**

General Instructions

1. Read all instructions carefully before answering the questions.
2. This question paper consists of **Twelve (12)** questions in **Six (6)** pages.
3. Answer All questions.
4. Section A has 10 questions and carry 20 marks. Answer should be marked in the answer sheet provided.
5. Section B has two questions and carry 40 marks in each. Answer should be written in the answer book provided. Answer for each question should commence from a new page.
6. This is a Closed Book Test **(CBT)**.
7. Answers should be in clear hand writing.
8. Do not use red colour pen.

Section A

Multiple Choice Questions [20 marks]

Select the most suitable answer.

1. Assume you are a business analyst of a software project. You have already completed the requirement gathering phase. Now in the requirement elicitation phase what method would you use to group those ideas without any duplication or loss?
   a. KJ Method
   b. Interviews
   c. Questions and Surveys
   d. Observational Methods`

2. At what stage do we conduct the impact analysis?
   a. At the completion of the product
   b. When BA completed the SRS document
   c. When deliverables were shared with the customer
   d. When user requested change for an existing requirement

3. The below mentioned requirement type describes the general software characteristics and is also known as a set of quality attributes.
   a. Functional Requirements
   b. Non-Functional Requirements
   c. Domain Requirements
   d. Internal Requirements

4. Out of the requirement types listed below, what would be the more detailed requirement type?
   a. System Requirements
   b. User Requirements
   c. Business Requirements
   d. Domain Requirements

5. Which of the following property does not correspond to a good Software Requirements Specification (SRS)?
   a. Verifiable
   b. Ambiguous
   c. Complete
   d. Traceable

6. What is the best fit approach to be used in elicitation and modelling to give a functional view of the system?
   a. Object Oriented Design
   b. Use Cases
   c. Fusion
   d. Object Modeling Technique

7. Traceability is not considered in Requirement Analysis?
    a. True
    b. False

8. Select the step which is not considered in requirement engineering?
    a. Elicitation
    b. Design
    c. Analysis
    d. Documentation

9. Out of the stakeholders mentioned below which would be the most important stakeholder?
    a. Entry level personnel
    b. Middle level stakeholder
    c. Managers
    d. Users of the software

10. Out of the diagrams studies at the requirement gathering following is not a diagram studied in Requirement Analysis?
    a. Use Cases
    b. Entity Relationship Diagram
    c. State Transition Diagram
    d. Activity Diagram

Section B

(Essay Questions) Answer All Questions

Case 1

The Transport ministry wanted to develop a system to reduce the frequent deaths of elephants due to accidents on rail tracks. Which is a major problem existing without solid solution discussed throughout the years in Sri Lanka. Studies carried out by scientists have identified that elephant deaths occur predominantly at night in Palugaswewa and Welikanda areas. Though various solutions are provided, nothing has worked so far. ProbSolute is a software development company, who agreed to provide a solution and appointed Nirash as the Business Analyst (BA) for the project. Nirash is a very junior BA with limited industry experience. Nirash has tracked the following list of requirements after talking to a person from the Transport ministry and technical lead of the project.

1. The team wanted to implement a mobile application.
2. Add railway map to the main view through the mobile application.
3. Calculating the distance between animals and the train.
4. The alarm system should be able to handle automatically and manually.
5. The mobile application shall be developed with minimum storage requirements.
6. Railway drivers should easily understood the features available in the mobile application.
7. If humidity sensor or any other equipment does not work properly it could pay off by animal or human life.
8. Derailed trains are more costly. Therefore, safety and accuracy are more important.
9. Any android application has a description about the terms, privacy, and policies. The user should read the description and user should accept the privacy and policies.
10. A driver shall be able to log in to his account using his driver's ID and NIC Number.
11. If in case the driver license goes to someone's hand, there is the probability that he may log in the above user account using the driver ID and NIC Number.
12. Thus, after first login, user shall be able to change the login credentials.
13. The system should be able to manage a maximum of six concurrent users at a time.
14. Railway Tracking System has following major functions, locate object(animal) via humidity sensor, receives the data from transmitter module.
15. User should be able to enlarge the image by one tap on the icon.

Question 1 [40 marks]
Answer the following questions referring to the above given 'Case 1'.

A. Nirash do not have a clear idea of different types of requirements. Therefore, as an experienced BA in the industry, explain three different types of requirements available in a software project providing examples. [6 marks]

B. Nirash has conducted formal interviews with the stakeholders. He told it is hard to collect the specific requirements related to the transport ministry, due to the conflict in different personal requirements.

    I.   Do you think Nirash has properly identified the stakeholders or sources to collect the requirements? Identify and list three sources to collect the required requirements. [6 marks]

    II.   As a professional BA, you need to guide Nirash to successfully complete the requirement gathering.

        i. Briefly explain the different types of requirement gathering techniques Nirash can be used. [8 marks]
        ii. List three main challenges Nirash might face when conducting the requirement gathering. [6 marks]

C. Nirash has listed 15 points as requirements under "Case 1". However, he has not properly documented the gathered requirements.

    I.   If ProbSolute wanted to conduct the project in Scrum, name two online tools, team can use to track and manage the requirements. [2 marks]
    II.   List three benefits a team can gain using online tools. [6 marks]
    III. List down two differences and similarities in requirement management in software projects run on waterfall model and agile process. [6 marks]

Question 2 [40 marks]

Answer following questions referring to the above given 'Case 1'.

A.   Select a badly written requirement from the above list and re-write it again as a user story/ Epic or a Theme. What you need to consider when writing a user story. [10 marks]

B.   List down three requirement elicitation techniques. Select a suitable elicitation technique and explain how you are planning to use it to elaborate the requirement gathered by Nirash. [06 marks]

C. 15 points listed by Nirash have lot of ambiguity. Therefore, you need to help Nirash to identify functional and non-functional requirements separately after removing ambiguity. You are free to make any assumptions. Explain the term non-functional and functional requirements. [12 marks]

D. Developing UML diagrams, use cases, context diagrams, story cards are requirement communication techniques used in software development projects. Draw a main use case for the system described in the 'Case 1'. Generalize the functionalities you have identified as much as possible. List down the assumptions you have made in drawing the main use case. [12 marks]

~End of the Paper~