National University of Computer and Emerging Sciences, Lahore Campus

Course Name:	Software Requirements Engineering	Course Code:	SE 2001
Degree Program:	BS (SE)	Semester:	Fall 2022
Exam Duration:	60 Minutes	Total Marks:	45
Paper Date:	27-Sep-2022	Weight	15%
Section:	ALL	Page(s):	5
Exam Type:	Midterm-I		

Student : Name:____Solution____ Roll No._____ Section:_____

Instruction/Notes: 1. Attempt all questions on the question paper. Do not submit any extra sheet, it will not be graded.

2. You are allowed to use a single-sided, hand-written, A-4 size help sheet.

3. State your assumptions clearly

Question 1 (Max. Marks = 10)

In each of the following MCQs, **circle** the most appropriate **single** option. Unclear answers will not be given any credit.

1) Prioritizing requirements during engineering of requirements corresponds to which of the following Requirements Engineering task(s)?
   a. Inception
   b. Requirements Negotiation
   c. Requirements Elaboration
   d. Requirements Specification

2) You have to develop a Context Diagram of a payroll system that needs to interact with an HR subsystem that manages employee information, a Secretary who manages distribution of pay cheques generated by the payroll system, a Finance department that requires reports from the payroll system, and an Attendance subsystem that manages employee timecards. How many bubbles (or processes) will the context diagram of this payroll system have?
   a. 0
   b. 1
   c. 4
   d. 3

3) The requirements engineering process is:
   a. Sequential in nature
   b. A role-action process
   c. Iterative in nature
   d. A coarse-grain process
   e. b and d only

4) Unified Process has the following characteristics:
   a. It considers Requirements as a discipline and not as a phase in project
   b. It has four phases
   c. It allows development of software by designing mini projects
   d. It allows frequent development of working deployable versions of the software
   e. All of the above

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5) One of the important ~~things~~ detailed requirements is to:
   a. Have all requirements prioritized
   (b.) Have all stakeholders prioritized
   c. Have all stakeholders listed
   d. Have all stakeholders interviewed
   e. None of the mentioned

6) For a System Requirements Specification document to be considered of good quality, all the requirements in it need to be:
   a. Verifiable/testable
   b. Complete
   c. Traceable
   d. Ambiguous
   e. All of the above
   (f.) a, b, and c only

7) Primary objective of Requirements Negotiation activity is to deal with:
   a. Incomplete requirements
   (b.) Conflicting requirements
   c. Functional requirements
   d. , Traceable requirements
   e. None of the mentioned

8) Consider the requirement statement "The system shall ensure that the user interface has minimum number of buttons"; This requirement is:
   a. Complete
   b. Traceable
   (c.) Ambiguous
   d. Relevant
   e. None of the mentioned

9) Primary objective of the Inception activity in RE is to:
   (a.) Identify stakeholders
   b. Get a complete list of prioritized requirements
   c. Have different viewpoints documented
   d. a and c only
   e. None of the mentioned

10) Primary objective of the Requirements Validation activity is to:
   a. Make sure that all requirements have been elaborated
   b. Make sure that all stakeholders have been prioritized
   c. Make sure that all the documented requirements are feasible
   d. All of the above
   (e.) None of the mentioned

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Question 2 (Max. Marks = 10)

Label each of the following requirements as Functional (F) or Non-functional (NF) in appropriate cell against each requirement.

Requirements	F / NF
1. The system shall be able to detect all the congested areas in a road network.	F
2. The system shall be able to process the data gathered from sensors.	F
3. The system shall be able to perform operations for one road network at a time.	NF
4. The system shall allow the vehicle owner to identify the areas with different levels of congestion e.g.: Not Congested, Congested and Highly Congested.	F
5. The system shall support devices that run on Windows, Linux or macOS.	NF
6. The system shall predict traffic congestion with an accuracy greater than 90%.	NF
7. The system shall perform operations efficiently.	NF
8. The system shall display results for congestion detection, prediction and propagation in a short span of time.	NF
9. The system shall perform congestion detection, prediction and propagation in real-time.	NF
10. The system shall be able to run on machines having at least 0.5GB of memory.	NF

Question 3 (Max. Marks = 10)

Label each of the following requirements as Testable (T) or Not-Testable (NT) in appropriate cell against each requirement.

Requirements	T / NT
1. The system shall show the error message in red color.	T
2. The system shall have multiple users connected at any given time.	T
3. The system shall have 0% down time.	NT
4. The system shall have a response time of 10 ms with maximum 5000 simultaneously connected users.	T
5. The system shall be remotely available for connections during routine working hours of our organization mentioned in our employee manual.	T
6. The system shall perform extremely precise calculations.	NT
7. The system shall display the contents in clear (visible to a normal eye from 2 feet distance) font size and color.	T
8. The system shall identify the people in the image with accuracy of 95% and above.	T
9. The system shall always correctly identify the 90% people in the input image.	NT
10. The system shall use the hardware economically to save the memory and disk space.	NT

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Question 4 (Max. Marks = 5+5 = 10)

A mobile application for our large scale Student Management System called Flex needs to be de[...]
the campus management has assigned this task to your company. Your company comprises of FA[...]
and they have a good understanding of the features in flex. The web based version of Flex has been[...]
successfully for more than 4 years and does not require any major changes in its functionalities in the[...]
version. All the members of your company have used the web based version during these years.

a.   You need to apply card sorting technique to elicit requirements and in this part you need to act as [...]
     user and fill the 5 cards given below. Remember to use short phrases in the cards that you develop[...]

b.   Now you need to act as a requirements engineer and organize the cards (developed in part a) as
     prescribed by card sorting technique. Provide a short rationale behind the organization. Incorrect
     organization will affect your marks

Rubric:

a) — max 5 words phrase   0.5   per card
   — Priority on the card. 0.5

b) Same cards together + labelled

Government is concerned about crop yields across the country every year and intends to establish a Crop Reporting system (CRS). You are deputed as a requirements engineer for development of this CRS.

First, you had meetings with higher officials and collected their needs about the expected reports (for example estimated yield of each crop in each village, aggregated yield estimate division wise, province wise etc.). You realize that it is a long list of comprehensive reports. The officials also want the reports to be quickly available (i.e. the data entry is frequent from the other side). The officials do not seem very concerned about the ease of entering data into the system.

Then you happen to talk to the government employees in the rural areas who will be responsible to enter data required to prepare the comprehensive reports. These employees are not comfortable entering the required large amount of data because there are too many input fields expected in the user interface. These fields can be filled either on different screen or on a single screen. The option of entering data through multiple screens may make it difficult for the employees to remember the context. The screens will be too large and complex if the fields are placed on a single screen, and there is chance of loss of data in case the computers shut down because of a power failure (which is very frequent). In any case, the entry of data will take long time consequently affecting the quick availability of reports. These employees suggest that some the number of reports should be less and they should be given more time for data entry. You also realize that these employees are very concerned about ease of use of the CRS to ensure correct entry of data.

Which requirements elicitation technique is the most effective to handle the disagreements in the different viewpoints of the stakeholders? Justify. Also describe how will you use the technique to handle the conflicting disputes.

Elicitation Technique Name: _____Repertory Grids . (RGs)_____

Justification:

There are conflicting viewpoints, RGs allow us to get the rankings of the req. from diff. Stakdalders & get these conflicts resolved by comparing & discussing the assigned ranks.

Description:

Get the requirements Separalely ranked 'at Scale @ 1 (least important) to 5 (most important) by Higher officials & Gort. Employees using a grid Similar to the following

	System features	Higher Officials	Gort. Employees
1	Number of reports		
2	Time taken to prepare & show report		
3	Ease of use of the data entry interface		
4	Time Taken to enter data		
5	Comprehensiveness of reports (# fields to enter)		

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