National University of Computer and Emerging Sciences, Lahore Campus

Course Name:	Software Requirements Engineering	Course Code:	SE 2001
Degree Program:	BS (SE)	Semester:	Fall 2021
Exam Duration:	60 Minutes	Total Marks:	40
Paper Date:	21-Oct-2021	Weight	10%
Section:	ALL	Page(s):	4

Student : Name: [redacted]

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 (unless otherwise specified). 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)? **Note:** You may select multiple options
   a. Requirements Elicitation
   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 goal of requirement engineering is to develop and maintain sophisticated and descriptive _____ document.
   a. Feasibility Study
   b. Requirement Gathering
   c. Software Requirement Validation
   d. System Requirements Specification

4) The rapid application development (RAD) process is
   a. another name for waterfall model
   b. a useful approach when requirements are not clear
   c. a high speed adaption of linear sequential model
   d. Both b and c
   e. None of the mentioned

5) Following issue(s) may be faced if a system requirement is wrong:

a. Delivery of the system may be delayed
b. Satisfaction level of users and/or customers may get low
c. High cost of system maintenance and evolution may be incurred
d. All of the above
e. None of the mentioned

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Question 2 (Max. Marks = 10)

List the software process model that you think will be most appropriate for the following situations. List your reasons for choosing a particular process. If you just list the process model without any justification, you will not be awarded any marks.

a. A mobile application for our large scale Student Management System called Flex needs to be developed and the campus management has assigned this task to your company, which has recently seen a tremendous growth in staff and can afford more staff if required. The online version of Flex has been running successfully for more than a year and does not require any major changes in its functionalities in the mobile version. One issue with the current design of Flex is less modularity, which needs to be fixed in the mobile application (i.e. a highly modularized system needs to be developed). The administration wants to launch the application within the next quarter. Unfortunately, the administration is not readily available and may take a day or two to respond to any email correspondence.

Process Model: ~~Incremental~~ Rapid Application Development

Reason(s):
- Requirements are clear and stable,
- Time deadline is to be met (next quarter)
- Large human resources are available so work can be done in parallel.
- Interaction with customer on frequent basis is not necessary.

b. Your software company is working on provide software based solutions to a client. They have asked you to develop another software system and this development project might take a few months or, maybe, a year or so to complete. In the initial meetings, user classes have been identified and many use cases have been identified which need to be well specified before moving to technical design of the software system. The client however insists that a working deployable version of the software needs to be available for review after every few weeks; the final complete system might get delivered towards the end of the project (i.e. after many possible iterations) though.

Process Model: Unified Process Model (UPM)

Reason(s):
- Long project.
- use cases identified so every activity of UPM can be performed.
- working versions are developed in every iteration for the customer to see/review.
- user classes and use cases are identified early on in the inception phase and business modelling
- use cases
- each iteration is deployable
- multiple iterations (deployable mini-projects) before delivery of final system

Marks = 10)

Determine whether the following statements are true or false. You will need to provide justification to get credit. The justification should be not more than 2 lines.

a. The following requirement is testable/verifiable: "The system shall have 0% down time."
True / False

quantitative description provided.
→ No test case against this

b. The following requirement is a non-functional requirement: "The application shall allow the user to retrieve forgotten passwords within 20 seconds of retrieval request."
True / False

constraint is mentioned (within 20 seconds).

c. For a System Requirements Specification document to be considered of good quality, all the requirements in it need to be verifiable, ambiguous, complete, and traceable.
True / False

unambigious

d. Requirements Negotiation deals with incomplete requirements.
True / False

It deals with different stakeholders who may have conflicting requirements. There is a need to negotiate which occurs.

e. The following requirement is ambiguous: "The user interface of the system is to have minimum number of buttons".
True / False

Minimum can mean differently for everyone.
A number would be clear (unambiguous)

Question 4 (Max. Marks = 10)

Develop a context diagram for the following system description.

Video-Rental Ltd. (VRL) is a small video rental store. The store lends videos to customers for a fee, and purchases videos from a local supplier. They need a computerized system that helps them run their daily business (including the rental services and the purchase of new videos from suppliers). Description of their daily business and expectations from the computerized system are as follows:

Only a registered customer can borrow videos from the store. New customers register by filling out a form with their personal details and credit card details. The credit card details are used to pay subscription fee, video borrowing fees, and overdue fines. On successful payment of subscription fee, the customer is issued a membership card by VRL. The membership card has a unique membership id which is later used when borrowing videos. Each new customer's form is also added to the customer file. A customer can request a video, through the computerized system, by providing video title, his/her membership id, and payment – payment is always made with the credit card used to open the customer account. If the payment is successful, the customer is sent the video by VRL through courier. The customer then returns the video (either in-person or by courier) to the store after watching it. If a loaned video is overdue by a day, the customer's credit card is charged, and a reminder letter is sent to the customer. Each day after that, a further transaction on card is made, and each week a reminder letter is sent. This continues until either the customer returns the video, or the charges are equal to the cost of replacing the video. The local video supplier sends a list of available titles to VRL store keeper, who decides whether to send the supplier an order and payment through the computerized system. If an order is sent then the supplier sends the requested videos to the store. For each new video a new stock form is completed and placed in the stock file by the store keeper.

Context Diagram