SE 2001: Software Requirements Engineering (A)

Quiz 1

Time: 20 minutes Max Marks: 20 Roll No. _____

Q1. 20 Marks

Relate the concepts of Column 1 with concepts of Column 3. Write the most appropriate match in 'Correct Match' column. Write alphabet only and not the complete entry.

Note: There are extra mismatched entries in Column 3 that do not relate with any entry of column 1.

Exactly one entry of column 3 matches with an entry of column 1. Each entry from column 3 matches with exactly one entry of column 1.

Entries	Correct Match	Mismatched Entries
Testing and Development Phases' Correspondence	N	A. A Science Fiction Film
Four Phases, OO, iterations, mini projects	C	B. Incremental Model
Four phases, Determine and Evaluate Risks, evolutionary	P	C. Unified Process
Short cycle time, subset of requirements well understood, scope of the project largely known, core product first	B	D. A participant/stakeholder who sponsors system development
Customer	D	E. Requirements Engineering
Requirements Unclear	H	F. A Requirement
Defining the problem that requires a solution	E	G. Possible consequence of wrong requirements gathering
A statement of system service or constraint	F	H. Prototyping Model
Stakeholder needs, existing systems' information, domain information	O	I. An RE activity
60 to 90 days development time, multiple development teams available, requirements understood	M	J. A participant/stakeholder in SE process who intends to use the software
Late system delivery, low customer satisfaction level	G	K. Risky Model
User	J	L. Output of RE process
Inception	I	M. RAD Model
Specification of agreed system requirements	L	N. V-Model
Understand the problem, Develop prototype, evaluate prototype	Q	O. Inputs to RE Process
Coarse-grain activity model, Role-Action model	R	P. Spiral Process Model
		Q. Actions in RE Process
		R. Requirements Process Models

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Quiz 2

Time: 20 minutes | Max Marks: 20 | Roll No. _____

Q1. **10 Marks**

Label each of the following requirements as Functional (F) or Non-functional (NF) in appropriate cell against each requirement. Two of the requirements have been already labeled for your ease and understanding

Requirements	F / NF
1. The system shall allow the customers to enroll themselves	**F**
2. The system shall allow the customers to place an order through internet.	**NF**
3. The system shall have the 'send invoice via email' text in clear and bolded font.	NF
4. The system must allow the customers to cancel their order within 10 minutes of placing the order.	NF
5. The system shall archive all ordering data for 2 years for auditing purposes.	F
6. The system shall allow the administrative staff to view order history of customers.	F
7. The system shall allow the customers to re-order from history.	F
8. The system shall be available to handle orders 12 hours a day, 5 days a week.	NF
9. The system shall allow the staff to print and send invoices to customers.	F
10. The system shall notify the customers in case their order cannot be fulfilled.	F
11. The system shall allow the customers to pay online via debit/credit card.	NF
12. The system shall save the customer's credit/debit card information in encrypted form.	NF

Q2 **10 Marks**

We need to write software for an ATM machine. The software will deal with customers' requests regarding withdrawal of money, change of PIN, checking of account info etc. The software needs to be written in JAVA. It will use a data base management tool, which is ORACLE. The hardware will include an ATM Machine at which the software runs and the software interacts with the ATM card reader and a keypad to get the input. The machine will display messages on screen to keep the customers informed during the processing of customers' transaction.

List 3 functional and 2 non-functional requirements for the ATM System (ATMS) in standard format with hierarchical numbering. All the requirements should be testable/verifiable

F

1.0 The software shall allow user to withdrawal of money, changing of PIN, and checking account information.

2.0 The software shall ~~use~~ ~~infer~~ use ORACLE database management system.

(This is NF not F)

3.0 The software shall display messages on screen to keep customers informed, during the customer's transaction.

NF

1.0 The software shall be written in JAVA.

~~2.0~~ ~~The software shall use a database management tool called ORACLE.~~

2.0 The software shall work on an ATM Machine

2.1 The software shall interact with ATM card reader and keypad to get the input.

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Quiz 3

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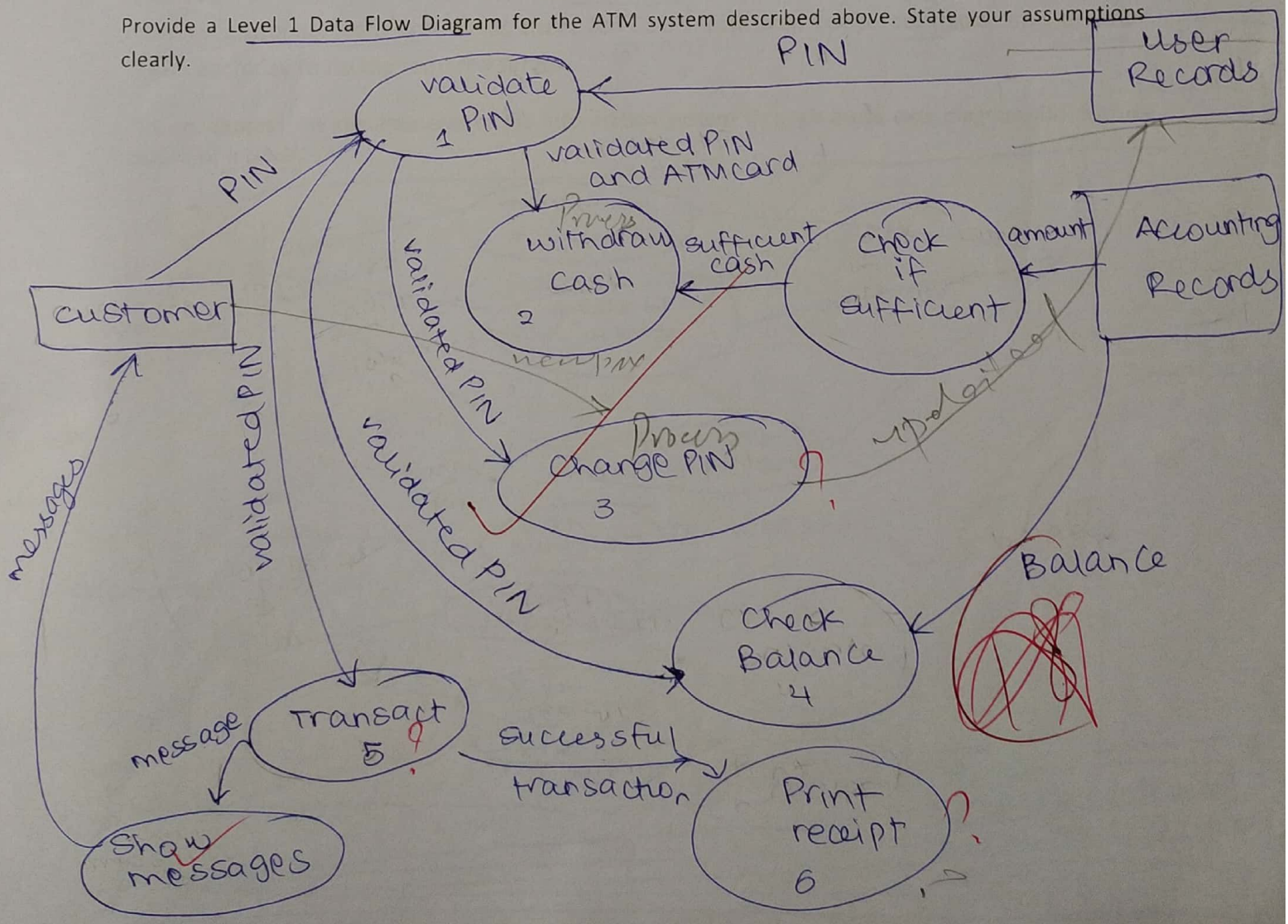
Time: 20 minutes | Max Marks: 20 | Roll No. _____

Q1. **20 Marks**

We need to write software for an ATM machine. The software deals with customers' requests regarding withdrawal of cash, change of PIN, checking of account info etc. To fulfill the customer needs, the system shall validate the user entered PIN from the user records before processing other requests. After the validation the system shall allow multiple operations. The system shall process the cash withdrawal request for the valid ATM card and PIN. Before returning the cash to the user, the system shall check for the sufficient amount for withdraw from the accounting records. Moreover, the system shall process PIN change request for a valid ATM card and valid PIN, the system shall process Balance Check request for a valid ATM Card and valid PIN, and the system shall process the print receipt request for any successful transaction. The system shall display messages on screen to keep the customers informed during the processing of customers' transaction. The software needs to be written in JAVA. It will use a data base management tool, which is ORACLE. The hardware will include an ATM Machine at which the software runs and the software interacts with the ATM card reader and a keypad to get the input. The machine will display messages on screen to keep the customers informed during the processing of customers' transaction.

Provide a Level 1 Data Flow Diagram for the ATM system described above. State your assumptions clearly.



SE 2001: Software Requirements Engineering (A)

Quiz 4

Time: 20 minutes | Max Marks: 20 | Roll No. _____

BSSE 3A

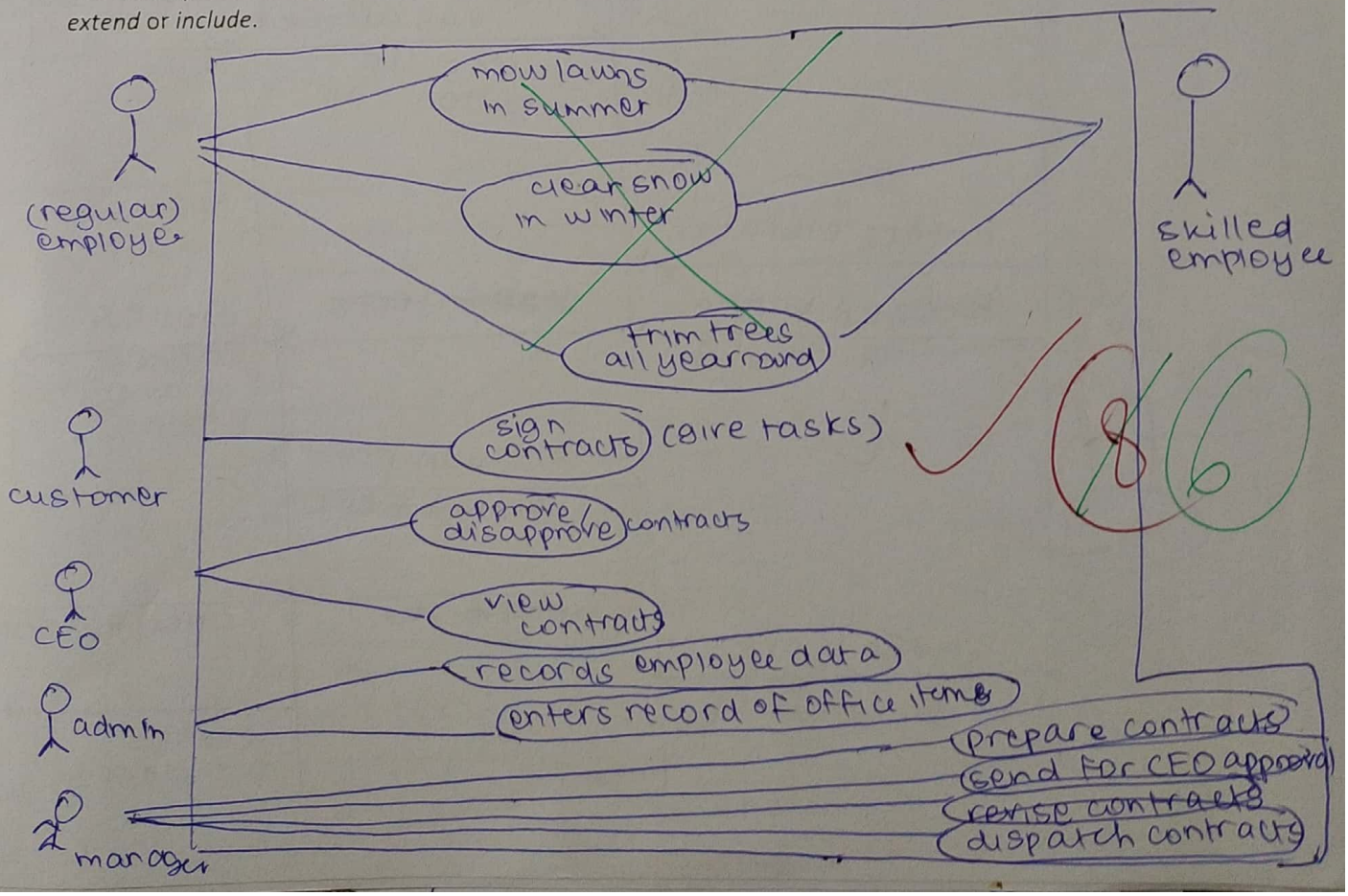
Q1. **10 Marks**

You are starting an outdoors services business. In the summer your employees will be mowing lawns and in the winter they will be clearing snow. All year round they will be trimming trees. Some skilled employees can do all three tasks; however, since trimming trees requires specialized training, not all employees will be able to do it.

Customers will be giving your company tasks and will be signing contracts with your company for each task. Charges for each of the 3 tasks are different. There is significant discount for customers who sign up for regular snow clearing or lawn mowing for an entire season.

An information system needs to be developed for the business above. You, as a CEO can view and approve/disapprove contracts. Admin of the system maintains records of all employees including your managers. Admin also enters record of all office items and equipment etc. Your managers prepare contracts; send them for CEO's approval, revise contracts, and dispatch crews each day to do the required service.

To do: Express the requirements of the information system through a use case diagram. Do not use *extend* or *include*.



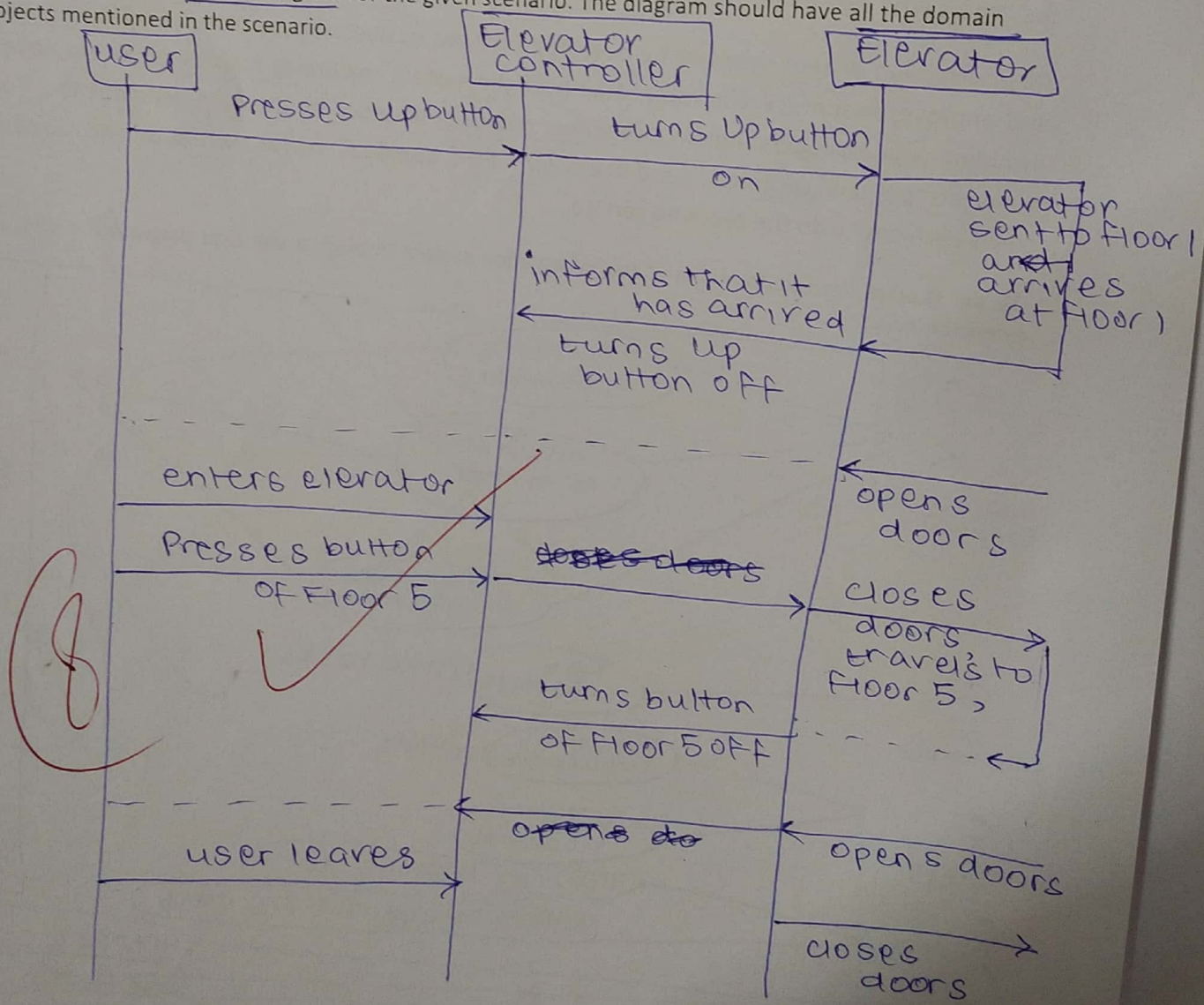
Q2. **10 Marks**

Consider the following scenario of using an elevator

1. User presses Up floor button at floor 1 to request the elevator. The user wishes to go to floor 5.
2. The Elevator Controller turns the Up floor button on and sends the Elevator to floor 1
3. Elevator arrives at floor 1.
4. Elevator informs the Elevator Controller about the arrival.
5. Elevator Controller turns the Up floor button off
6. Elevator opens the Doors. User enters the Elevator
7. User presses Elevator Button for floor 5
8. Elevator closes the doors.
9. Elevator travels to floor 5.
10. Elevator turns the elevator button for floor 5 off.
11. Elevator opens the doors. User leaves the Elevator
12. Elevator closes the doors

user controll elev

To do: Develop a sequence diagram for the given scenario. The diagram should have all the domain objects mentioned in the scenario.



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SE 2001: Software Requirements Engineering (A)

Quiz 5

Time: 20 minutes | Max Marks: 20 | Roll N [redacted]

Q1. **20 Marks**

At our university we have many courses and multiple sections of these courses are offered in different semesters. Faculty members teach multiple sections in a semester and students can register in multiple sections (of different courses) in each semester. All courses have a title, course code, credit hours, and type (core or elective). Each semester has a title (e.g. Spring 2021, Fall 2021), starting date, ending date. Every teacher has a name and an area of expertise. All students have their names and roll numbers recorded in the database. Sections have a label (e.g. A, B, C) and one section in a semester belongs to one course only. All this information needs to be stored in database and the university would like to know many things from these records; for example which student took a particular course in a particular section with a particular faculty member in a given semester.

To do: Express these requirements using an Entity-Relationship (ER) diagram. Use the notation used in the class. Include all possible entities, their attributes, and relationships.
Hint: Keep things simple. Keep the relationships between the entities binary.