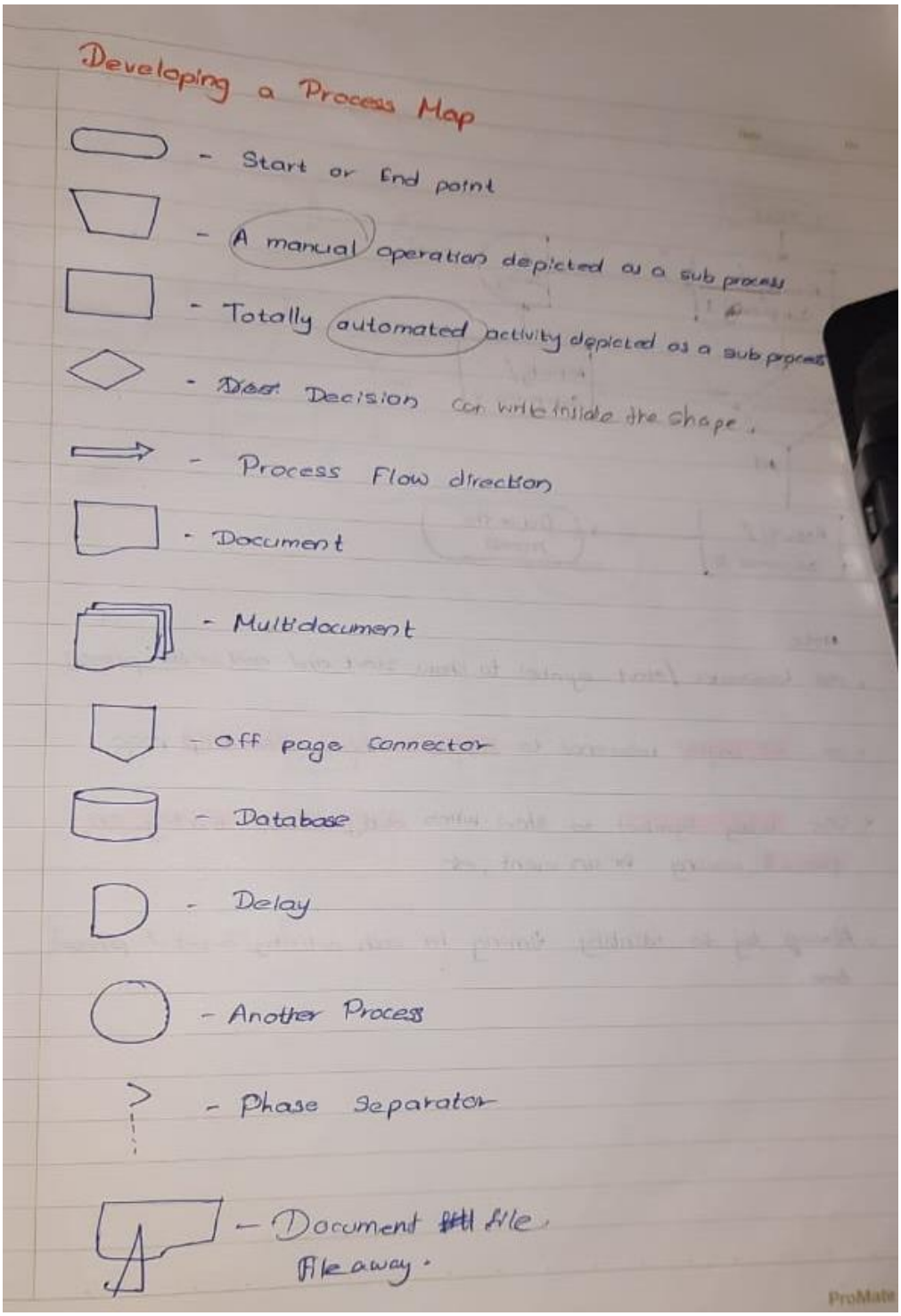
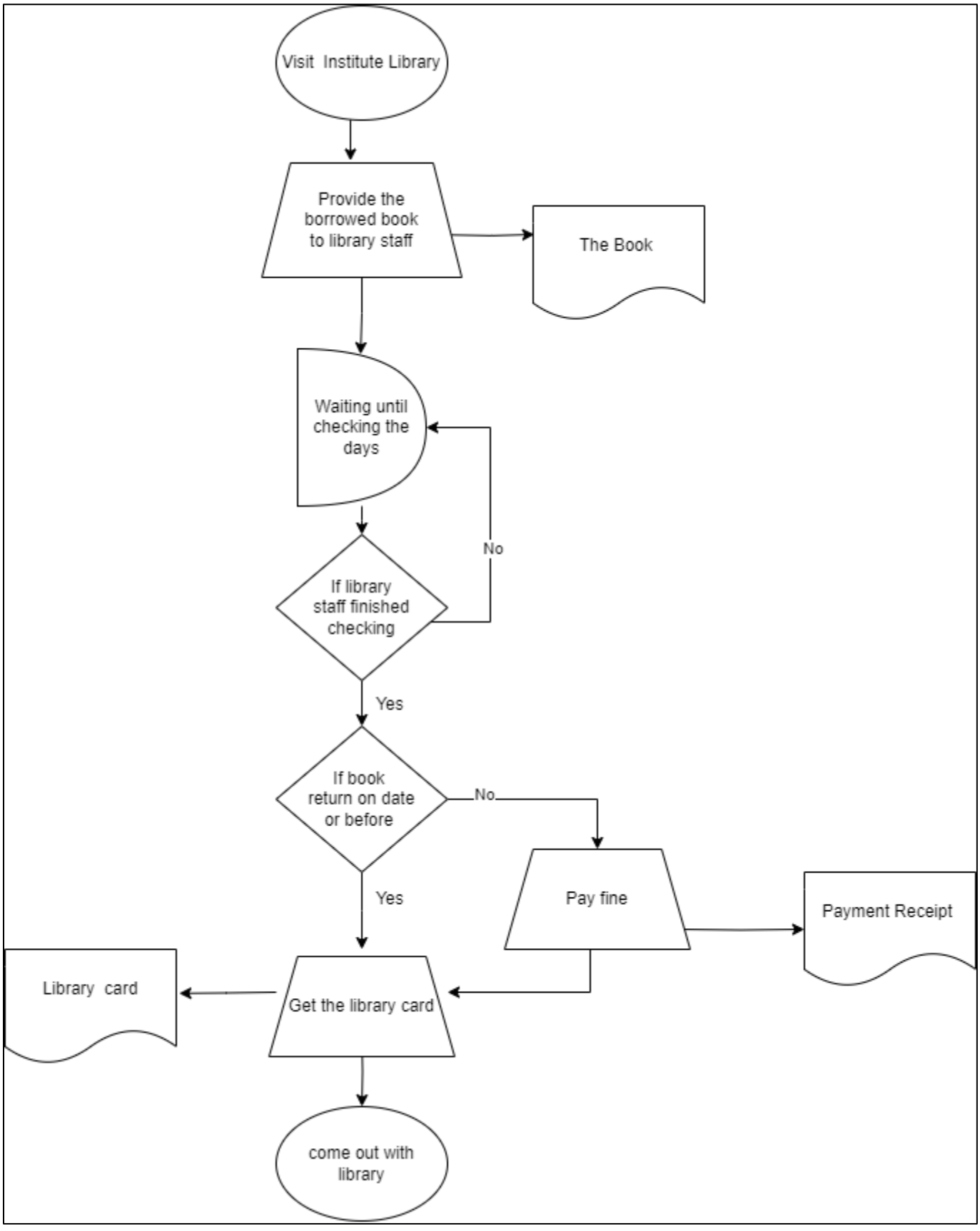
ISDM Nov 2022 Answer

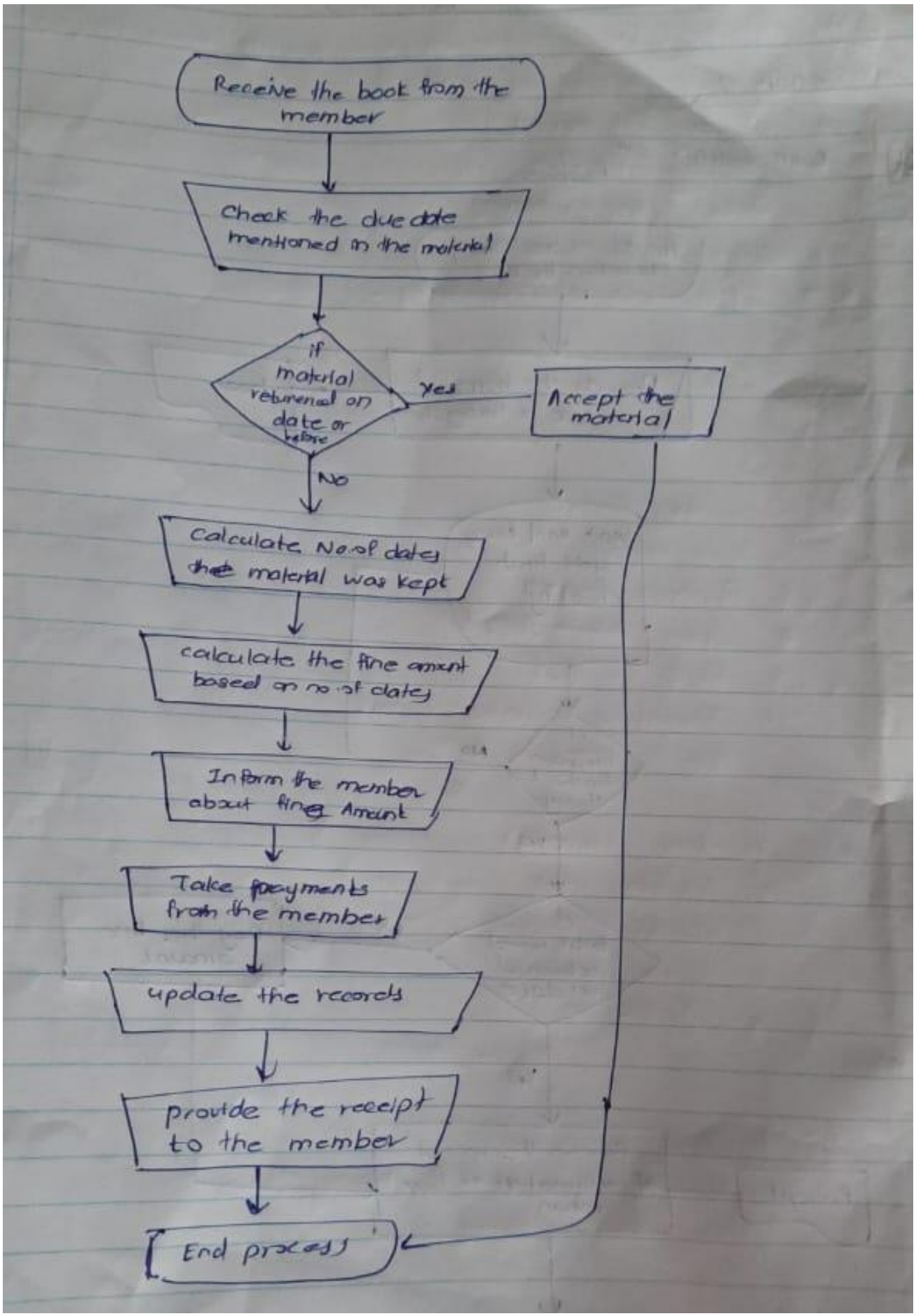
Question 01



a.) Student side



Librarian side



b.) 1.)

Item Purchase:

Item code
Item description
Purchase quantity
Supplier information
Purchase date
Purchase price
Item Sale:

Item code
Sale quantity
Customer information
Sale date
Sale price

2.)

Inventory Reports:

Items available in the inventory
Stock levels of each item
Reorder points for items
Item details (name, code, description, price)
Sales Reports:

Sales transactions

Revenue generated

Customer information

Sales summaries

3.)

Item Database:

Item details (name, code, description, price)

Stock levels

Reorder points

Supplier Database:
Supplier information (name, contact details)

Customer Database:
Customer information (name, contact details)

Sales Transaction History:
Sales records (item code, quantity sold, sale date, customer details)

Purchase Transaction History:
Purchase records (item code, quantity purchased, purchase date, supplier details)

4.)
Inventory Management:
Manages stock levels
Updates item availability
Monitors reorder points

Sales Management:
Handles sales transactions
Updates sales records
Calculates revenue generated

Purchase Management:
Handles purchase transactions
Updates purchase records
Updates item availability

Reporting:
Generates inventory reports
Generates sales reports
Provides data for analysis and decision-making

Database Management:
Manages and maintains the databases for items, suppliers, customers, sales, and purchases
Ensures data integrity and security

C)
i.)
Improved Data Accuracy: A database solution can provide a centralized and structured storage system for inventory and transaction data. This helps ensure data accuracy and consistency, reducing errors caused by manual data entry or disparate systems. Accurate data enables Bigz Store to make informed decisions and avoid costly mistakes.

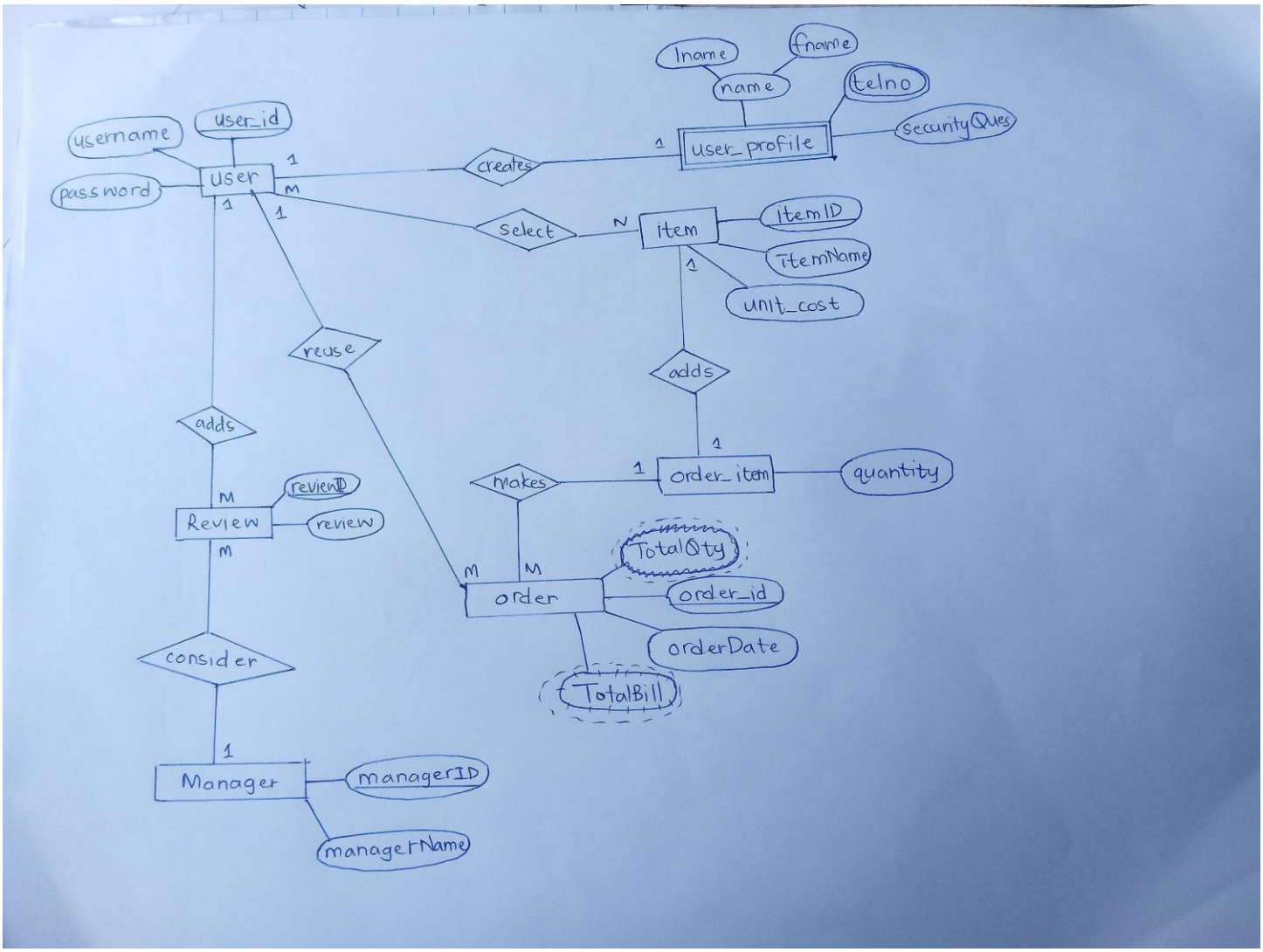
Efficient Inventory Management: With a database solution, Bigz Store can track inventory levels in real-time, allowing them to optimize stock levels, avoid stockouts, and reduce excess inventory. Accurate inventory data helps streamline the supply chain, minimize carrying costs, and improve overall operational efficiency.

Enhanced Decision-making and Reporting: A database solution enables Bigz Store to generate comprehensive reports and perform data analysis to gain insights into sales trends, customer preferences, and inventory performance. This information empowers management to make data-driven decisions, identify opportunities, and proactively address inventory-related challenges.

ii) The schema that includes details about the inventory data stored in the database in the Three Schema Architecture is the Conceptual Schema or the Logical Schema. This schema defines the overall structure and organization of the inventory data, including tables, relationships, and constraints.

iii) The schema that describes details about the indexes created to speed up data retrieval in the Three Schema Architecture is the Physical Schema. This schema specifies the physical implementation of the database, including storage structures, indexing techniques, and performance optimization strategies. It focuses on efficient data storage and retrieval mechanisms, such as creating indexes on relevant columns to improve query performance.

Question 02


lname
fname
name
telno
user_profile
securityQues
username
user_id
password
user
creates
1
M
1
1
select
N
item
itemID
itemName
unit_cost
1
reuse
adds
adds
1
1
makes
order_item
quantity
M
reviewID
Review
review
M
M
M
TotalQty
order
order_id
orderDate
TotalBill
consider
1
Manager
managerID
managerName

Question 03

Steps for select entity order

1. strong entity OR regular
2. weak entities
3. 1:1
4. 1:M
5: M:N

Lecturer(Lecture_ID, Lecturer_Name, Subject_ID)

Subjects(Subject_ID, Subject_Name, Course_ID)

Course(Course_ID, Course_Name)

CourseStudent(Course_ID, Student_ID)

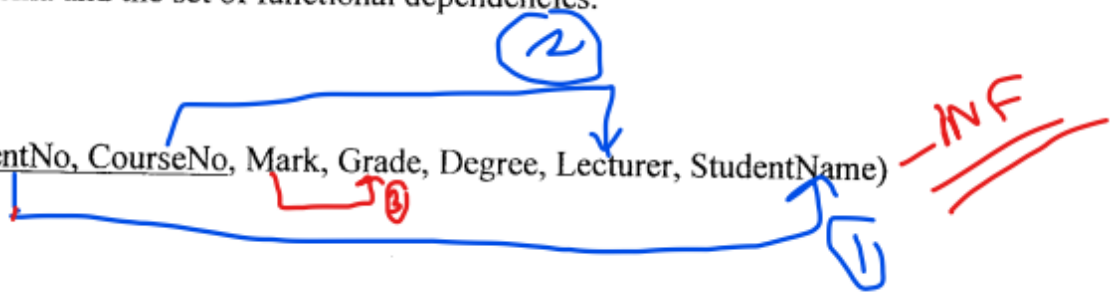
Student(Student_ID, Student_Name, Age, DOB, DOOR, STREET CITY STATE PIN)

StudentHobby(Student_ID, Hobby)

Question 04

Consider the following schema and the set of functional dependencies.

StudentPerformance (StudentNo, CourseNo, Mark, Grade, Degree, Lecturer, StudentName)



StudentNo ⟶ StudentName

CourseNo ⟶ Lecturer

Mark ⟶ Grade

a) In which Normal Form (NF) is the schema StudentPerformance in? Explain your answer. 1NF

(03 marks)

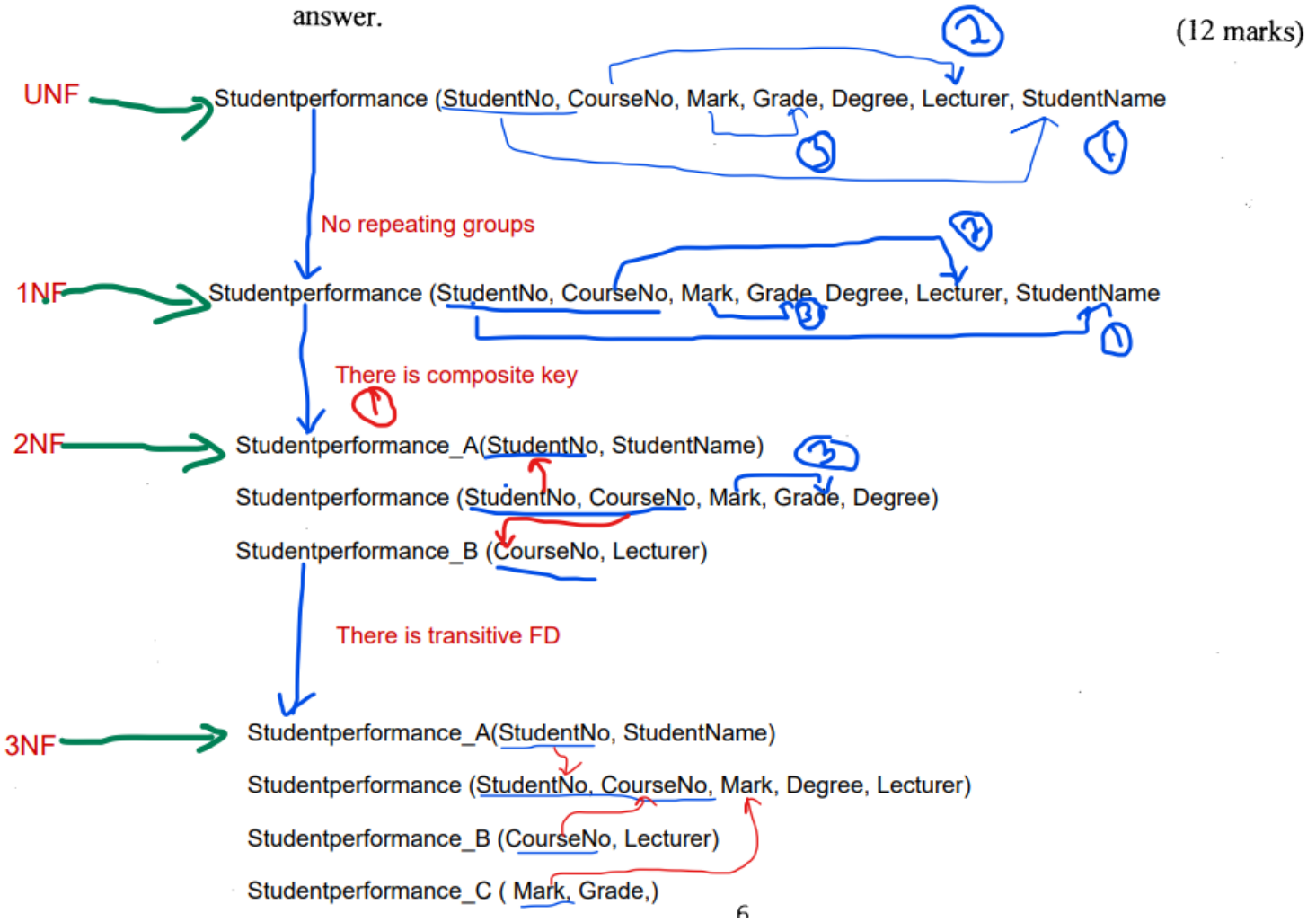
There is not a primary key, It is a composite key. So there are no any repeating groups.

b) If the schema is not in 3NF convert it to a schema in 3NF. Explain each step of your answer.

(12 marks)

There is not a primary key, it is a composite key. So there are no any repeating groups.

b) If the schema is not in 3NF convert it to a schema in 3NF. Explain each step of your answer. (12 marks)



Question 05

a.)

```
SELECT hotel_id, hotel_name
FROM Hotel
WHERE hotel_rent > 1000 AND hotel_name LIKE  "%hotel%";
```

b.)

```
SELECT c.cus_id, c.cus_name
FROM Booking b, Customer c
WHERE b.cusid = c.cus_id
ORDER BY c.cus_name desc;
```

c.)

```
SELECT travel_agent_id, travel_agent_name_description
FROM travel_agent
WHERE travel_agent_id = (
  SELECT travel_agent_id
  FROM travel
  GROUP BY travel_agent_id
  ORDER BY COUNT(*) DESC
  LIMIT 1
);
```

d.)

```
SELECT c.cus_id, c.cus_name, c.cus_add, COUNT(*) AS num_hotels_booked
FROM customer c,  booking b
WHERE c.cus_id = b.cus_id
GROUP BY c.cus_id, c.cus_name, c.cus_add
HAVING COUNT(*) > 2;
```