

1. From your understanding define briefly the following:
(You can give examples if you want) (12 points)

Database System: It is like the University environment where students^{data} and courses are stored ~~in~~.

Data Model: A set of concepts that describe the structure of a Database and certain constraints that the database should obey.

DBMS: (Database management system), a software package facilitate the creation and update of a database.

2. State and Briefly describe the three-schema levels (13 points)

- Conceptual (high level, semantic):
That describes the concept and structure of
database that ~~may~~ many users perceive. *one +*

- Physical (low level - internal): describes
how data is stored in the
Extend *at one*

- ~~Implementation~~ (representational): how the
views the data stored

3. State 5 advantages of the Database Approach. (15 points)

- Controlling redundancy in data
- Sharing data among multiple users
- Providing Backup and recovery systems
- Restricting unauthorized access to data
- Enforce integrity constraints

4. Draw the EER model (with all details like: entities, attributes, relations with cardinality, constraints, etc) for the following system description: **(30 Points)**

The regular account/loan Department in a Bank has the following Entities

Customer: Customer ID, Name, Date of birth, Address(street, city, building), Tel Numbers

Account: Account Number, Account type, Name, Currency, Balance, and Date opened.

Loan Account: Loan Account Number, PaymentPeriod, duration

Saving Account: Interest, InterestPeriod

Checking Account: Monthly charges

Transactions: Transaction ID, Transaction Type, Transaction date, Amount, currency

Cash-Transactions: value date

Check-Transactions: Check Number, owner, beneficiary, date

Loan: Loan ID, Loan currency, Loan amount, Monthly payments, Start Date, End Date, Interest rate.

Loan Payments: Payment ID, currency, amount

Description

Loan: Loan ID, Loan currency, Loan amount, Monthly payments, Start Date, End Date, Interest rate.

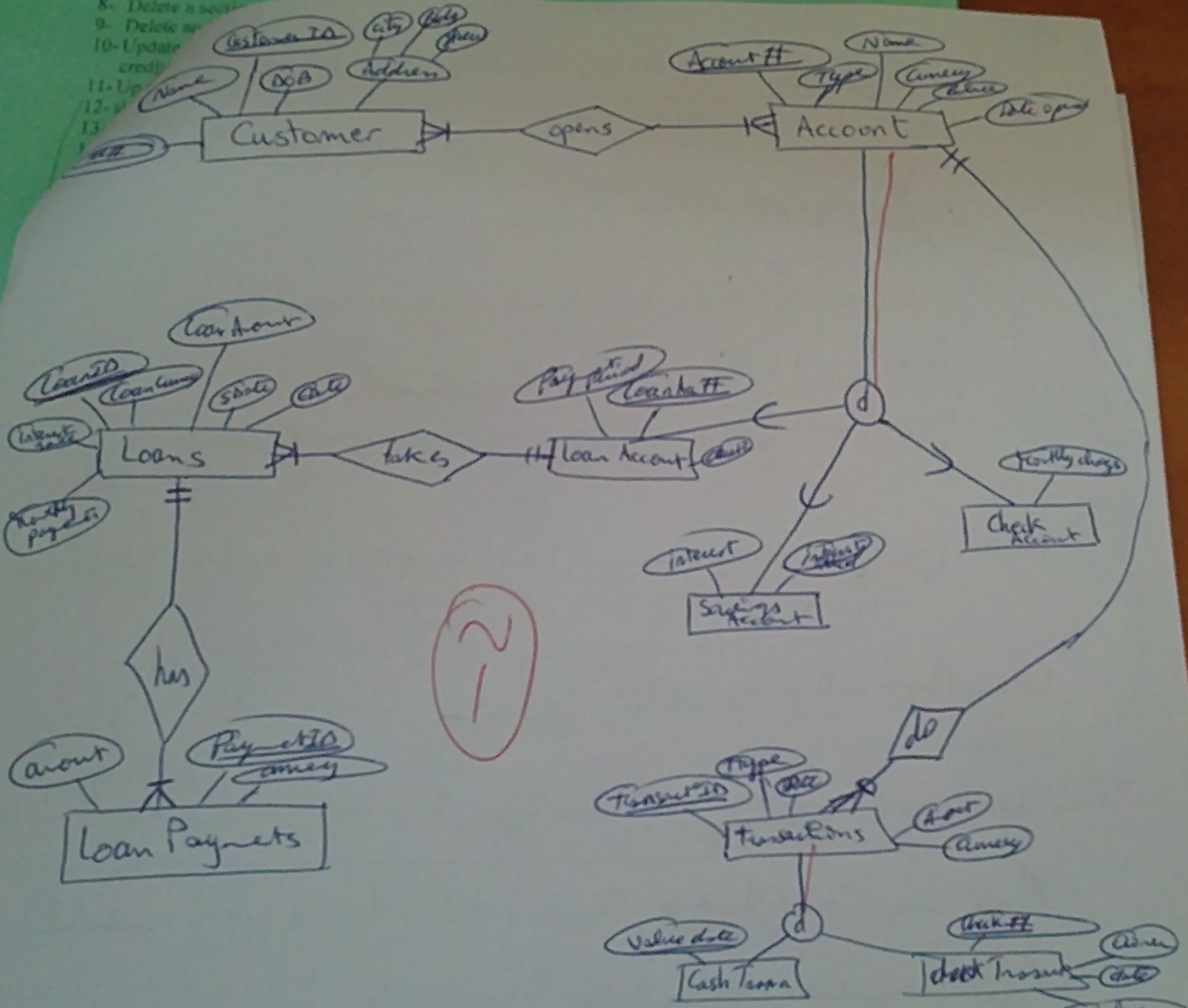
Loan Payments: Payment ID, currency, amount

Description

- A customer(many) can open an account (many)
- An account should be saving, checking or loan account and cannot be a combination d
- A regular account can do transactions that are of two kinds (should be one and a combination): Cash and check transactions. d
- A loan account can take one or more loans
- Loan payments are done by a specific a specific loan

Transform the EER into relations showing referential integrity (30 points)

- 8. Delete a bank
- 9. Delete an
- 10. Update credit
- 11. Up
- 12. p
- 13.



5) Customer (CustomerID, Name, DOB, City, Bldg, Street)

Tel# (CustomerID, Telephone Number)

Open (AccountID, CustomerID)

Account (Account#, Type, Name, Currency, Balance, DateOpened)

SavingsAccount (Account#, Interest, Interest Period)

Check Account (Account#, Monthly Charges)

Loan Account (Account#, Loan Acct#, Payment period duration)

Loan (LoanID, Loan Currency, Loan Amount, Start date, End date, Interest Rate, Monthly Payment, Loan Acct#)

Loan Payments (PaymentID, LoanID, Currency, Amount)

Transaction (TransactionID, Trans.Type, Trans date, Amount, Currency, Acct#)

Check Transaction (Check#, Owner, date, Beneficiary, TransID)

Cash Transaction (Value date, TransID)

