BANK — 1 — Branches — N — BANK_BRANCH

BANK attributes: Code, Name, Addr

BANK_BRANCH attributes: Addr, Branch_no

BANK_BRANCH — 1 — LOANS — N — LOAN

LOAN attributes: Loan_no, Amount

ACCTS — 1 ... N

ACCOUNT attributes: ACCT_no, Balance

ACCOUNT — d — Checking Account, Certificate of deposit (fixed period), Saving account (Interest rate), Retirement Account (Duration)

ACCOUNT — M — A-C — N — Customer

ACCOUNT — M — Transaction — N — Account transaction (Amount, type (Checks, Withdraw, Deposits), Date)

Customer attributes: SSN, Phone, Name, Addr

LOAN — d — Home Loan (property id), Accessories loan (Accessories type), Car loan (car id)

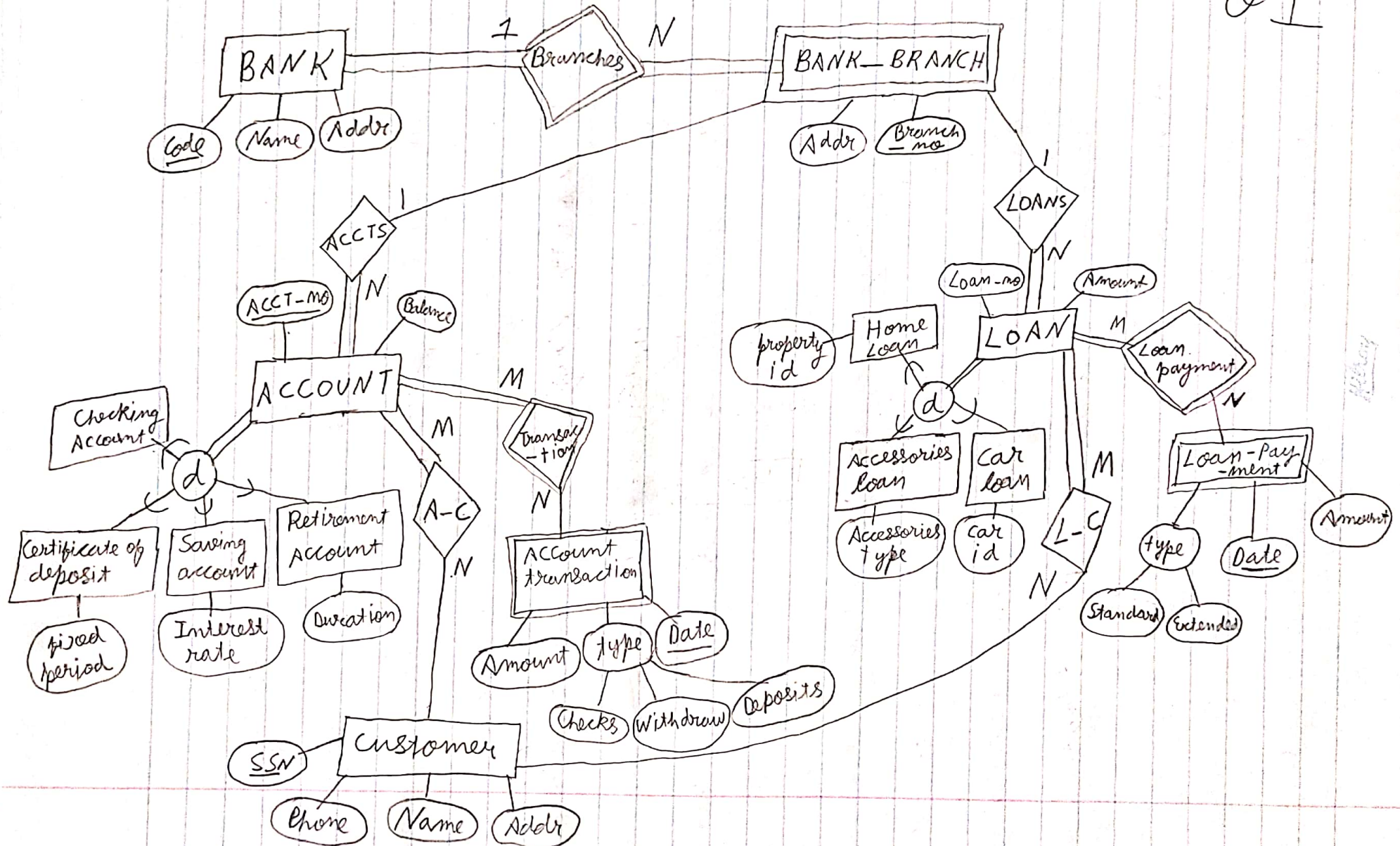LOAN — M — Loan payment — N — Loan-Payment (type (Standard, Extended), Date, Amount)

LOAN — M — L-C — N — Customer

Q1 Explanation

(1) To keep track of different type of Accounts and Loans we will need to use the concept of sub classes.

Assumption→ Here Sub classes of Account are Certificate of deposits, Saving, checking, Retirement Account only.

→ The type attribute of Account transaction is a Composite...

{ only these type exist for our E-R diagram } attribute which Consists of checks, withdraw, Deposits (Only)

→ The subclasses of Loan are Accesories loan, Car loan and Home loan only.

(2) To keep track of Account transaction I created a identifying

(Account transaction Can not exist without Account) relation called transaction from Accounts and (M:N) for Loan payment tracking I had a new M:N identifying relation from Loans as loan payment depend on Loans entity.

→ This is a M:N relation because different accounts Could have different Account transactions

→ Similarly for Loan payment it is M:N as different

Loans with many diffrent Loans payment could be possible.

→ Total participation from Account to transaction as there must be a account before any transaction. Similarly for loans

Q2
① Relational model Conversion from ER diagram

Step 1 → Consider all strong Entities

→ primary Key

Event (Ename, CFP Text, Weblink)

Relation name ↑

↓

attributes

Research topic (Area, R-Name)

People (Affiliation, P-Name)

Step 2 → Add weak Entity

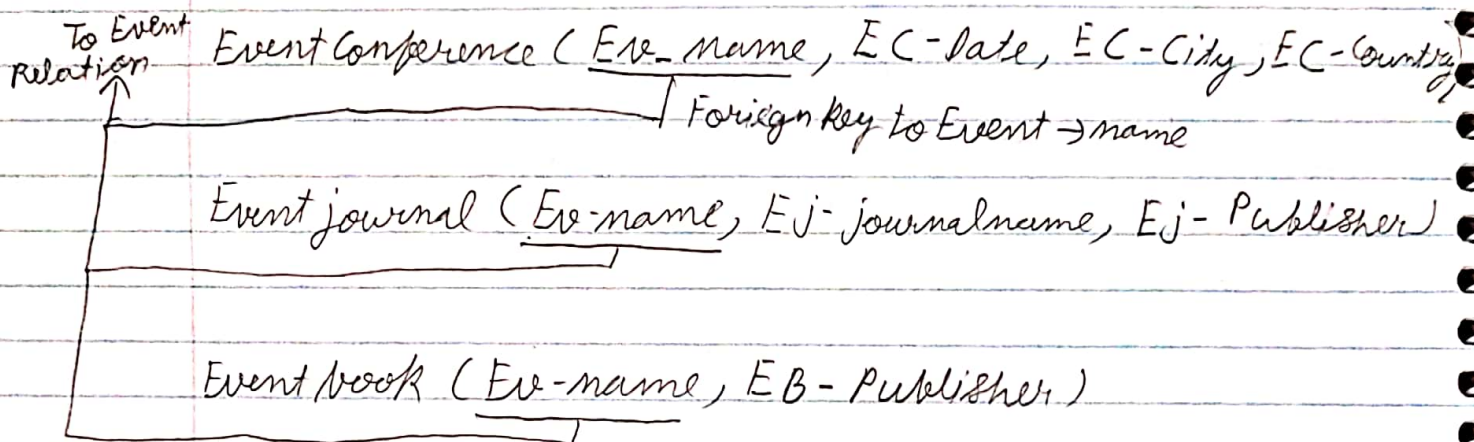Activity (EA-Name, Event-name, A-date, Activity name)

Foriegn key to Event

Step 3 Mapping of M:N relations

Organises (EO-name, PO-name, role)

Covers (EC-name, RC-name)

<u>Step 4</u>   Subclasses :-

To Event Event Conference (<u>Ev- name</u>, EC-Date, EC-City, EC-Country)
Relation
         |_____| Foreign key to Event → name

         Event journal (<u>Ev-name</u>, EJ- journalname, EJ- Publisher)

         Event book (<u>Ev-name</u>, EB- Publisher)

★   Uniqueness :-

(1) for <u>Event table</u> ⇒ CFPT_text is not unique as it could

    be Similar among diffrent event

  → Similarly web link could be Shared by diffrent

    event for diffrent dates so not unique

(2) for <u>Activity table</u> ⇒ Event_name and Activity name

    should be unique to remove any misunderstanding.

(3) Event journal name is unique to make sure 2

    diffrent journal are distinguished

(4) for <u>Event book table</u> ⇒ publisher is not unique

    as multiple publisher could publish same book