

## **G4-T7**

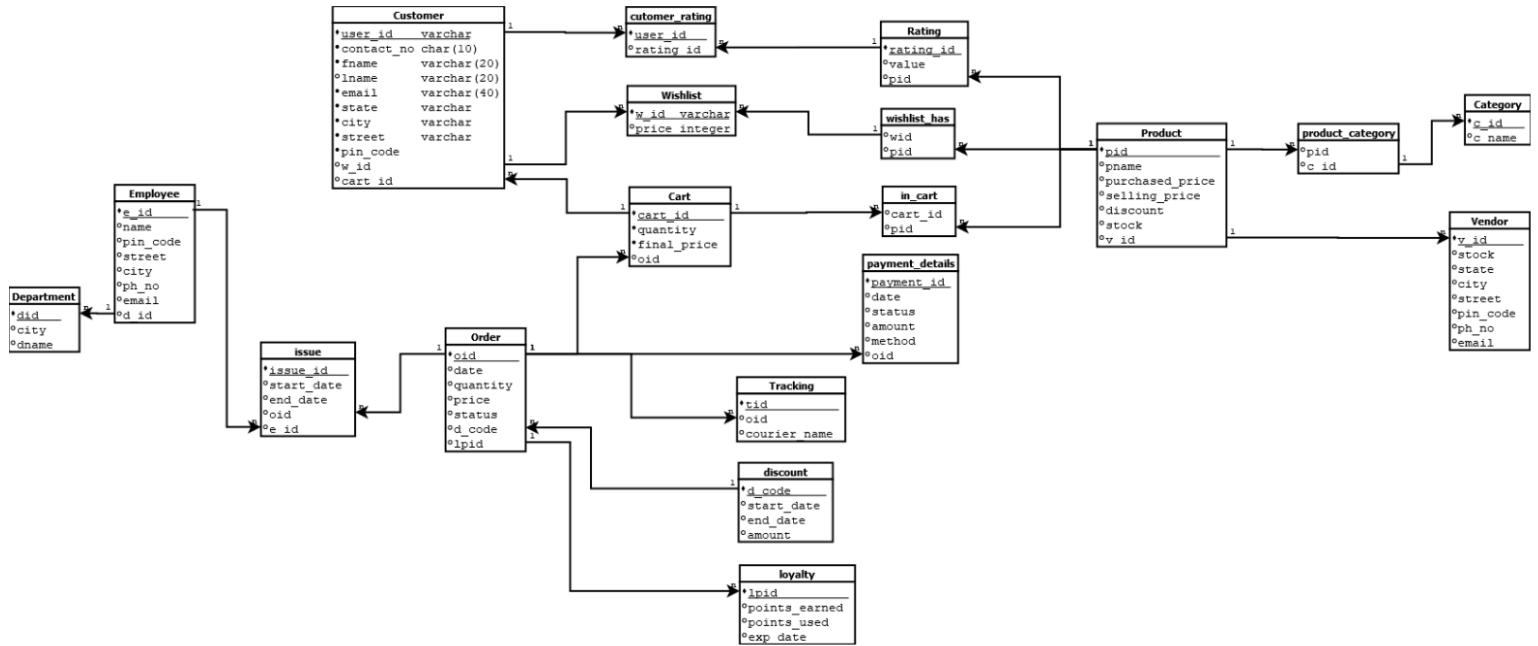
### **IT214 Database Management System**

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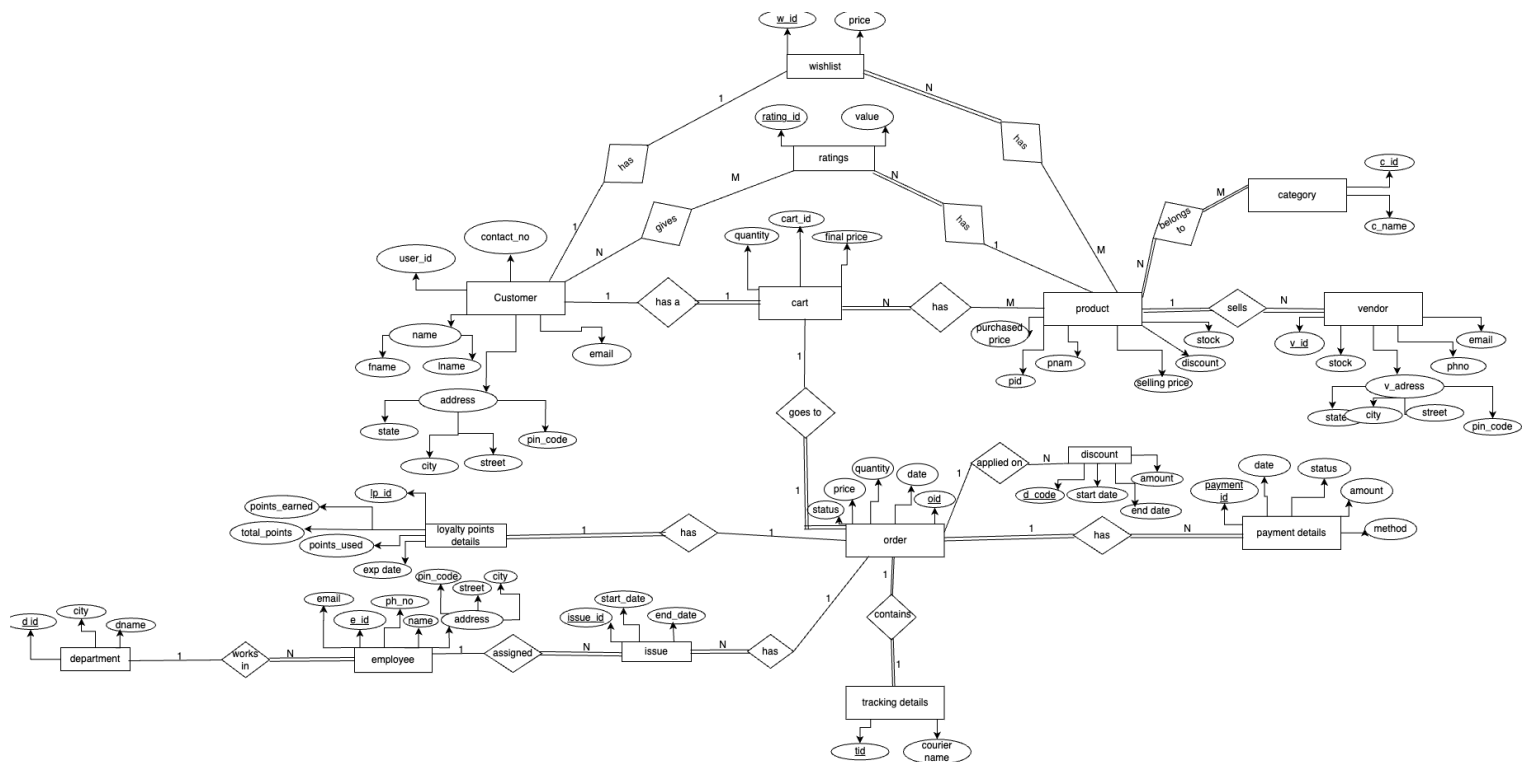
#### **Disclaimer:**

- There have been modifications made to the ER diagram to accommodate more attributes and include appropriate relations to rectify the previous version of the ERD.
- Therefore, all the questions required for the current submission are answered based on the updated version of the ERD.

### Updated Relational Schema:



**ER Diagram:**



## Minimal FD set

### Customer Table

**Customer**(user\_id, contact\_no, fname, lname, email, state, city, street, pin\_code, w\_id, cart\_id)

**FDs:** user\_id → contact\_no, fname, lname, email, state, city, street, pin\_code, w\_id, cart\_id

### Employee Table

**Employee**(e\_id, name, pin\_code, street, city, ph\_no, email, d\_id, issue\_id)

**FDs:** e\_id → name, pin\_code, street, city, ph\_no, email, d\_id, issue\_id

### Department Table

**Department**(did, city, dname)

**FDs:** did → city, dname

### Issue Table

**Issue**(issue\_id, start\_date, end\_date, oid)

**FDs:** issue\_id → start\_date, end\_date, oid

### Order Table

**Order**(oid, date, quantity, price, status, d\_code, tid, lpid)

**FDs:** oid → date, quantity, price, status, d\_code, tid, lpid

### Customer Rating Table

**Customer\_Rating**(user\_id, rating\_id)

**FDs:** user\_id → rating\_id

### Rating Table

**Rating**(rating\_id, value, pid)

**FDs:** rating\_id → value, pid

### Wishlist Table

**Wishlist**(w\_id, price)

**FDs:** w\_id → price

### Wishlist\_Has Table

**Wishlist\_Has**(wid, pid)

**FDs:** (wid, pid) → ∅

#### **Cart Table**

**Cart**(cart\_id, quantity, final\_price, oid)

**FDs:** cart\_id → quantity, final\_price, oid

#### **In\_Cart Table**

**In\_Cart**(cart\_id, pid)

**FDs:** (cart\_id, pid) → ∅

#### **Payment Details Table**

**Payment\_Details**(payment\_id, date, status, amount, method, oid)

**FDs:** payment\_id → date, status, amount, method, oid

#### **Product Table**

**Product**(pid, pname, purchased\_price, selling\_price, discount, stock, v\_id)

**FDs:** pid → pname, purchased\_price, selling\_price, discount, stock, v\_id

#### **Product Category Table**

**Product\_Category**(pid, c\_id)

**FDs:** pid → c\_id

#### **Category Table**

**Category**(c\_id, c\_name)

**FDs:** c\_id → c\_name

#### **Vendor Table**

**Vendor**(v\_id, stock, state, city, street, pin\_code, ph\_no, email)

**FDs:** v\_id → stock, state, city, street, pin\_code, ph\_no, email

#### **Discount Table**

**Discount**(d\_code, start\_date, end\_date, amount)

**FDs:** d\_code → start\_date, end\_date, amount

#### **Tracking Table**

**Tracking**(tid, courier\_name)

**FDs:** tid → courier\_name

### **Loyalty Table**

**Loyalty**(lpid, points\_earned, points\_used, exp\_date)

**FDs:** lpid → points\_earned, points\_used, exp\_date

## BCNF Proof of the Database Schema

Below is the analysis of the FD we got above to prove that our schema meets the BCNF standard:

Table	Functional Dependency (FD)	Is LHS a Superkey?
Customer	user_id $\rightarrow$ ...	Yes
Employee	e_id $\rightarrow$ ...	Yes
Department	did $\rightarrow$ ...	Yes
Issue	issue_id $\rightarrow$ ...	Yes
Order	oid $\rightarrow$ ...	Yes
Customer_Rating	user_id $\rightarrow$ rating_id	Yes
Rating	rating_id $\rightarrow$ value, pid	Yes
Wishlist	w_id $\rightarrow$ price	Yes
Wishlist_Has	(wid, pid) $\rightarrow \emptyset$	Yes
Cart	cart_id $\rightarrow$ ...	Yes
In_Cart	(cart_id, pid) $\rightarrow \emptyset$	Yes
Payment_Details	payment_id $\rightarrow$ ...	Yes
Product	pid $\rightarrow$ ...	Yes
Product_Category	pid $\rightarrow$ c_id	Yes
Category	c_id $\rightarrow$ c_name	Yes
Vendor	v_id $\rightarrow$ ...	Yes
Discount	d_code $\rightarrow$ ...	Yes
Tracking	tid $\rightarrow$ courier_name	Yes
Loyalty	lpid $\rightarrow$ ...	Yes

### Conclusion:

All tables satisfy BCNF conditions. There are no functional dependencies where the LHS is not a superkey.

This table is fully in Boyce-Codd Normal Form (BCNF).