

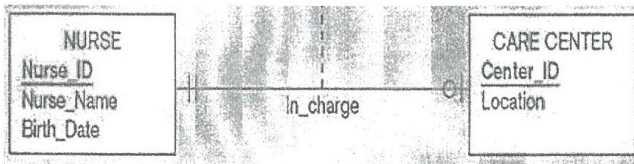
Answer the following question: (in Two pages)

Question 1 (30 Marks)

- (a) Draw a block diagram for the Systems waterfall Life Cycle.
- (b) SELECT statement is one of the important statements in SQL language. Write the parts of this statement in order.
- (c) Transfer each of the following ER schemas to Relational Database schemas.



Fig(1)



Fig(2)



Fig (3)

Question 2 (20 Marks)

- (a) Mention the main steps in Data Normalization.
- (b) The following table shows a relation called PART SUPPLIER for a university.
 - i. Draw a relational schema and diagram the functional dependencies in the relation.
 - ii. In what normal form is this relation? (Convert into 1NF if needed.)
 - iii. Decompose PART SUPPLIER into a set of 3NF relations.
 - iv. Draw a relational schema for your 3NF relations and show the referential integrity constraints.

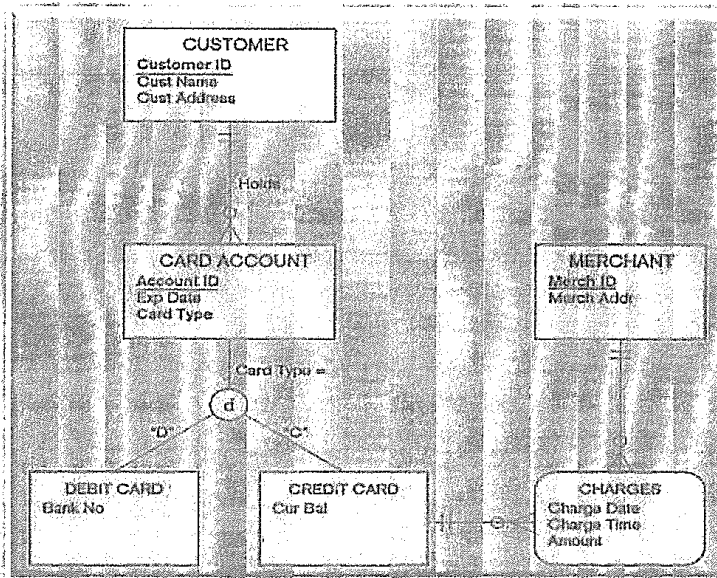
Part No	Description	Vendor Name	Address	Unit Cost
1234	Logic chip	Fast Chips	Cupertino	10.00
		Smart Chips	Phoenix	8.00
5678	Memory chip	Fast Chips	Cupertino	3.00
		Quality Chips	Austin	2.00
		Smart Chips	Phoenix	5.00

Question 3 (20 Marks)

- (a) In SQL environment, SQL commands can be classified into three types. (a) Mention them with examples; (b) Describe their relation with the database development process.
- (b) A rental car agency classifies the vehicles it rents into four categories: **compact, midsize, full-size, and sport utility**. The agency wants to record the following data for all vehicles: **Vehicle ID, Make, Model, Year, and Color**. There are no unique attributes for any of the *four* classes of vehicle. The entity type **VEHICLE** has a relationship (named **RENTS**) with a **CUSTOMER** entity type. None of the four vehicle classes has a unique relationship with an entity type.
- Would you consider creating a supertype/subtype relationship for this problem?
 - Draw an Entity-Relationship schema for this situation. (Remember to include a subtype discriminator.("d" or "o"))
 - What attribute or attributes did you designate as the identifier for the **VEHICLE** entity? Why?

Question 4 (20 Marks)

- a) There are "**Three-Schema Architecture for Database Development**". Mention the three types of database schema. Draw the database schema architecture block diagram.
- b) The following EER diagram for a simplified credit card environment.
- Transfer EER diagram to Relational Database diagram.
 - Then write the SQL code for the entity called "**Charges**".



With my best wishes

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