

7. (a) Illustrate the use of each of the following constraints that can be applied to specializations/generalizations with the help of an example :

(i) Disjoint Total

(ii) Disjoint Partial

(iii) Overlapping Partial.

2+2+2

- (b) Consider the following relations :

Student			Course		
SId	Sname	CNum	CNo	Cname	Dept
1	Anu	6	6	XX	Maths
2	Shyam	8	7	YY	CompSc
3	Rakesh	6	8	ZZ	English

Here, SId is a Primary Key and CNum is a Foreign Key in Student relation. CNo is primary in Course relation.

For each of the following operations, indicate whether it results in constraint violation and if so, why ?

- (i) Insert  $\langle 4, \text{'Preeti'}, 10 \rangle$  in Student
- (ii) Insert  $\langle 5, \text{'Reena'}, 7 \rangle$  in Student
- (iii) Delete  $\langle 6, \text{'XX'}, \text{'Maths'} \rangle$  from Dept
- (iv) Insert  $\langle 10, \text{'AA'}, \text{'Electronics'} \rangle$  in Course 4

This question paper contains 8 printed pages]

Roll No.

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S. No. of Question Paper : 6514

Unique Paper Code : 32341403

HC

Name of the Paper : Database Management Systems

Name of the Course : B.Sc. (H) Computer Sc.

Semester : IV

Duration : 3 Hours

Maximum Marks : 75

(Write your Roll No. on the top immediately on receipt of this question paper.)

Question No. 1 is compulsory.

Attempt any *four* questions out of the remaining Q. No. 2–Q. No. 7.

Parts of a question must be answered together.

1. (a) Two sets of FDs for a relation R (A,B,C,D,E) are given as follows :

$$F = \{A \rightarrow B$$

$$AB \rightarrow C$$

$$D \rightarrow AC$$

$$D \rightarrow E\}$$

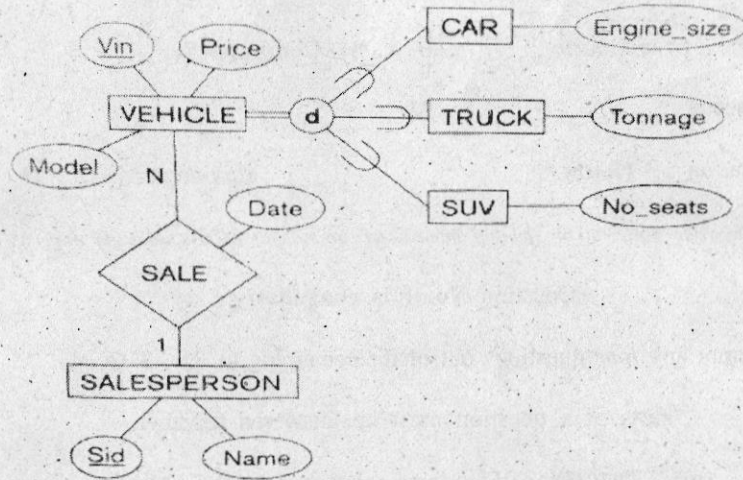
$$G = \{A \rightarrow BC$$

$$D \rightarrow AE\}$$

Are F and G equivalent ? Justify your answer.

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- (b) Consider the following EER diagram for a vehicle dealer database. Vin (Vehicle Identification) is primary key for the entity VEHICLE and Sid (Salesperson Id) is the primary key for the entity SALESPERSON :



Convert the following components of the above EER diagram to relational tables :

- (i) 1 : N relationship
  - (ii) Specialization. 2+3
- (c) Give SQL command to create a relational table using the following information :
- A table T with the attributes T1(int), T2(char(20)), T3(int), T4(char(6)), T5(int)
  - (T1, T2) form the primary key

5. (a) Consider the universal relation  $R = \{A, B, C, D, E, F, G, H, I, J\}$  and the set of functional dependencies  $F = \{\{A, B\} \rightarrow \{C\}, \{A\} \rightarrow \{D, E\}, \{B\} \rightarrow \{F\}, \{F\} \rightarrow \{G, H\}, \{D\} \rightarrow \{I, J\}\}$ . Find the key of R? Decompose R into 2NF and then 3NF relations. 2+2+2
- (b) Differentiate between functional dependency and full functional dependency. Give an example of a relation that is in 3NF but not in BCNF giving reasons. 2+2
6. (a) Consider the tables given below and answer the following queries in relational algebra :
- item(ItemCode, ItemName, ItemPrice, ItemQty)
- customer(CustCode, CustName, CustAddress, CustPhone)
- issue(IssueCode, ItemCode, IssueDate, IssueQty, CustCode)
- (i) Find the names of distinct customers who have got issued any item with price above 1000/-.
  - (ii) Give the details of the costliest item.
  - (iii) Give the details of all those customers who bought an item with item code '1005'. 2+2+2
- (b) Give *four* advantages of the DBMS approach over the conventional file system approach. 4