

4	<p>Draw the <u>ER diagram</u> and <u>Schema diagram</u> for the following Database: Hospital (<u>HID</u>, HName, Loaction); Doctor (DID, Dname, HID, Specialty); Patient (PID, Pname, DID, Age); Receptionist (RID, RName, HID); Record (PID, DID, Appointment-Type). →The Hospital has Doctors and Receptionist. Receptionist maintains Record. Doctor treats patients.</p>	[7+3]	CO1	L3
5	<p>Consider the Hospital database: Hospital (Reg-no, Doctor-id, Patient-id, Fee-paid, Consult_Year) Write relational algebraic expressions for the following questions:</p> <ol style="list-style-type: none"> Find the list of patients who paid above 1,000 /- fees under the supervision of doctor-id 13. Find only the Doctor -id and Patient-ids for the consultation Year 2023. Rename the resulting relation from the previous step to New-Hospital including its attributes. Find the count of patients assigned to each doctor and also the average fee amount paid for each doctor. Find the list of patients for whom either the fee-paid>2,000 or Consultation year is 2022. 	[10]	CO2	L3
6	Stepwise with neat diagram demonstrate ER to Relational Mapping	[10]	CO1	L2

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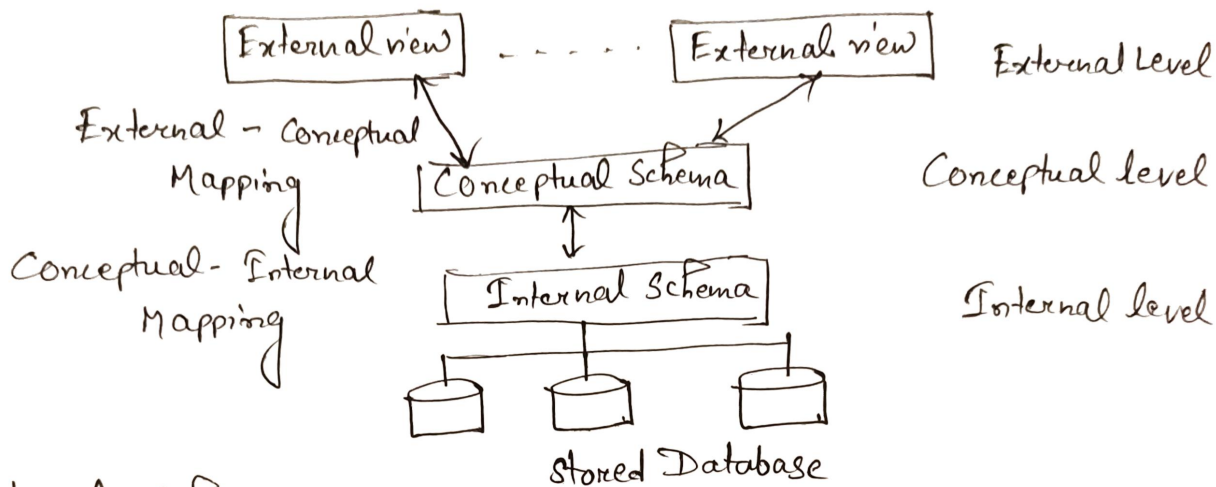
2023-24 Even
(June-2024)

BCS403 - Database Management System

IAT1: Answer Key and Solution

① (i) Three Schema Architecture

(5M)

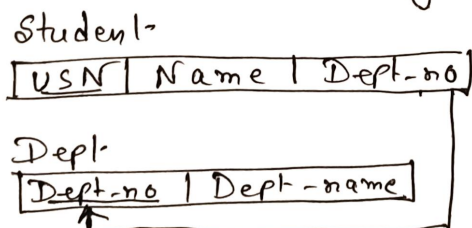


Internal Schema: Describes the physical storage structure.

Conceptual Schema: Describes entities, datatypes, relationships.

External Schema: Describes part of a DB that a particular user group is interested to view.

(ii) a) Database Schema :- Logical structure of a Database. (5M)

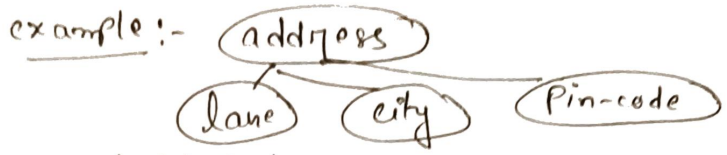


Database State :- The data in the database at a particular moment in time.

Student-

USN	Name	Dept-no
10	Hari	100

(b) Composite Attribute:- Consists of smaller subparts or sub attributes.



Multivalued Attribute:-

Can have multiple values.



2 (i) create table Product (Product-id int primary key,
 Product-name varchar(40),
 Price int not null,
 Customer-ID int,
 Purchase-year int)
 unique

(10M)
 [2MX5Q]

Insert into Product values (1, mobile, 1000, 10, 2020)
 (2, keyboard, 15000, 20, 2021)
 (3, Printer, 9000, 30, 2019)
 (4, Monitor, 10000, 30, 2024)
 (5, speaker, 12000, 20, 2024);

- (ii) Select- Product-name
 From Product-
 where (price < 10000) and (purchase-year < 2024);
- (iii) Select- Count- (Product-id) as C-Prod, Customer-ID
 From Product-
 Group by Customer-ID
 Order by Customer-ID DESC;
- (iv) Delete From Product-
 where Product-name = "Mobile";
- (v) update Product-
 Set- Price = 20000
 where Product-name = "Keyboard" and price = 15000;

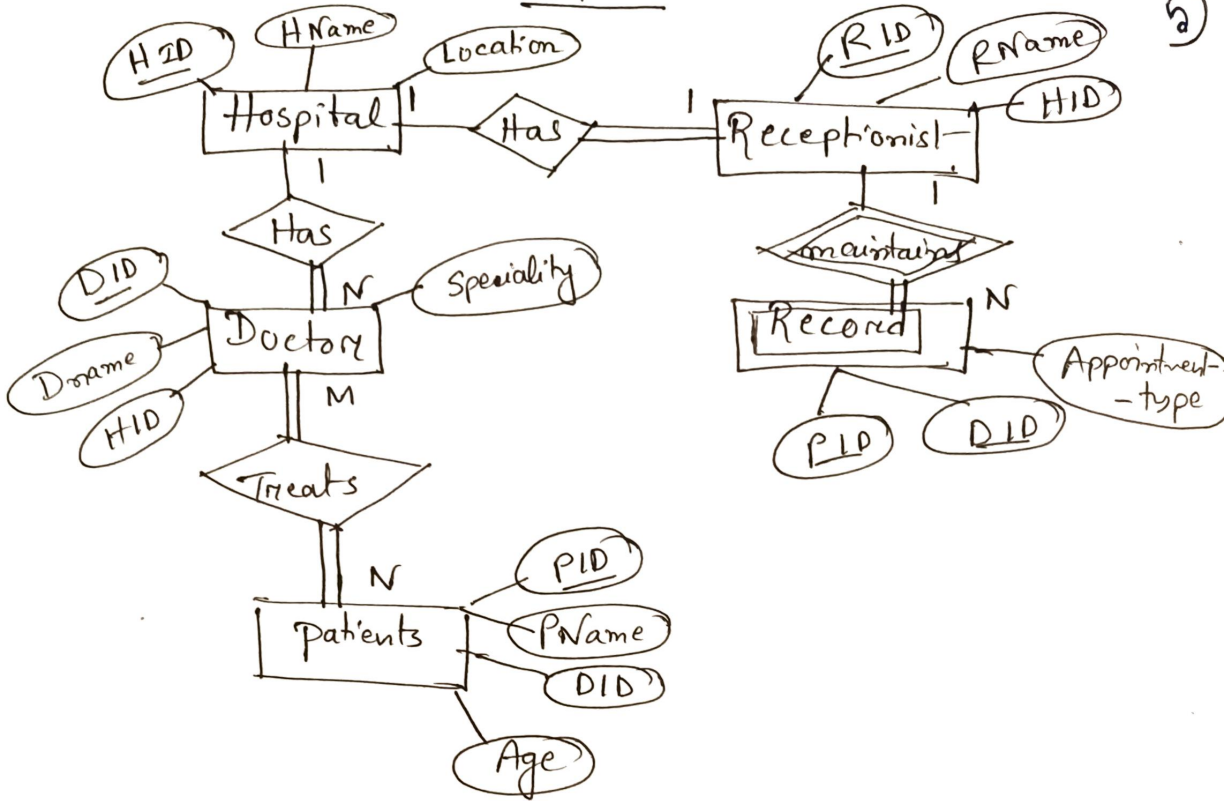
③ Relational Model Constraints :- (10M)

- ① Domain Constraint :- within each tuple, the value of each attribute must be atomic.
- ② Key constraint :- [unique constraint -
 Not null constraint -
- ③ Entity Integrity constraint :- Primary key cannot be null.
- ④ Referential Integrity constraint :-

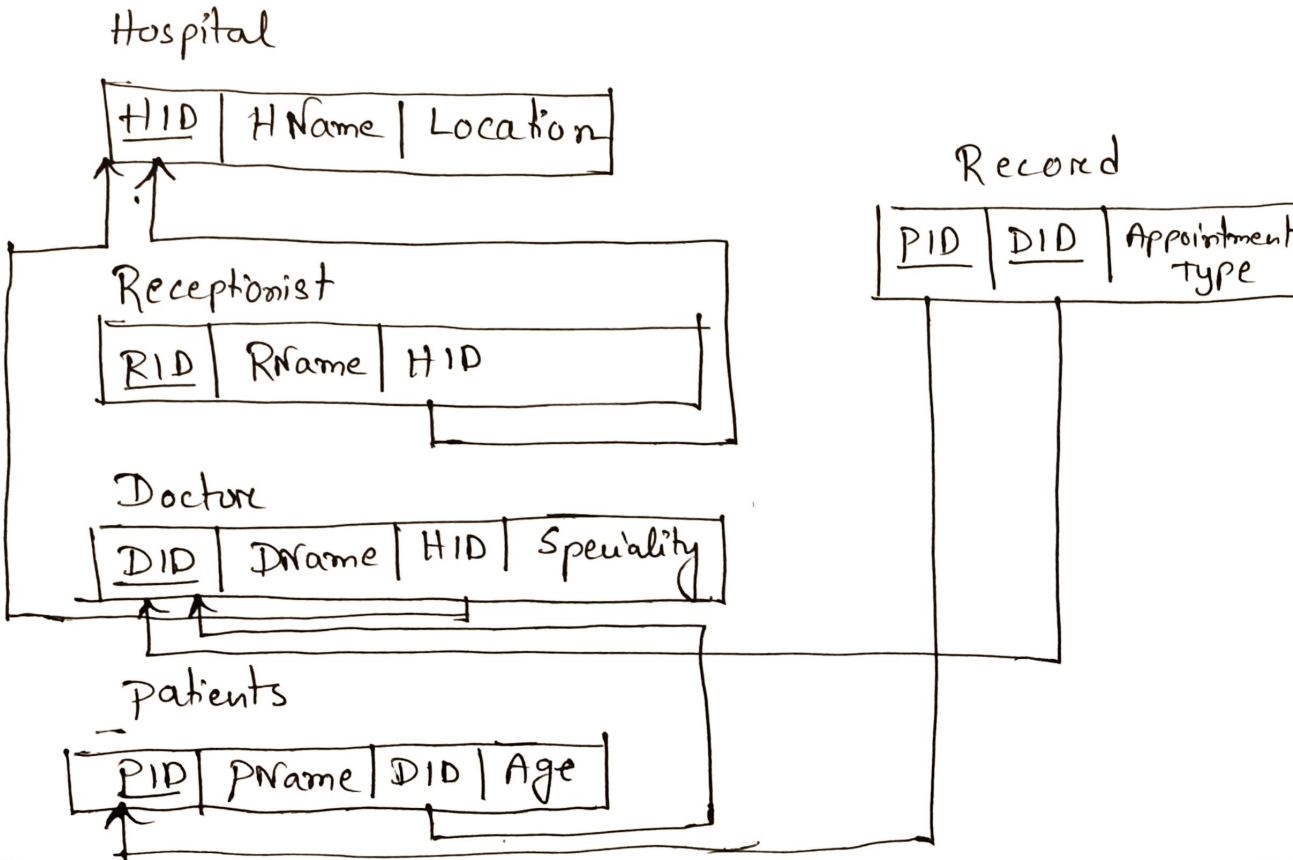
A tuple in one relation that refers to another relation must refer to an existing tuple in that relation.

7 ER Diagram (7M)

10M
(7M+3M)



Schema Diagram (3M)



(2) (i) $\Pi_{\text{patient-id}} \left(\sigma_{(\text{Fee-paid} > 1000) \wedge (\text{doctor-id} = 13)} \right)$ (Hospital) 1011
211752

(ii) $\Pi_{\text{Doctor-id, patient-id}} \left(\sigma_{\text{Consult-year} = 2023} \right)$ (Hospital)

(iii) $R_1 \leftarrow \Pi_{\text{Doctor-id, patient-id}} \left(\sigma_{\text{consult-year} = 2023} \right)$ (Hospital)

(iv) $\rho_{\text{New-Hospital}} \left(\sigma_{(D-id, P-id)} \right)$ (R1)

(v) $\text{Doctor-id} \left(\int \text{COUNT patient-id AVG Fee-paid} \right)$ (Hospital)

(vi) $\Pi_{\text{patient-id}} \left(\sigma_{(\text{Fee-paid} > 2000) \vee (\text{consult-year} = 2022)} \right)$ (Hospital)

⑥ ER to Relational Mapping steps

(i) Mapping of Regular entity types

(ii) Mapping of Weak entity types

(iii) Mapping of Binary 1:1 relationship type

(iv) Mapping of Binary 1:N relationship type

(v) Mapping of Binary M:N relationship type

(vi) Mapping of multivalued attribute

(vii) Mapping of N-ary relationship type.

(10M)