



Examination : CAT-I / CAT-II / Others

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 Class Number: CH2025260503062 Signature of the student: Jarjay

Q No	Marks		Q No	Marks		Q No	Marks		Q No	Marks	
	a	b		a	b		a	b		a	b
1			11			21			31		
2			12			22			32		
3			13			23			33		
4			14			24			34		
5			15			25			35		
6			16			26			36		
7			17			27			37		
8			18			28			38		
9			19			29			39		
10			20			30			40		
Sub-Total			Sub-Total			Sub-Total			Sub-Total		



Invigilator Name / Code: 53343
 Signature with date: [Signature] 28/11
 Initial of Superintendent / Coordinator: _____
 Marks : Grand Total (in figures) _____
 (in words) _____
 Evaluator's Name : _____
 Prof: RAJESH. M
 Evaluator's Signature with date: [Signature]
 Office use: 11/2/26

b.)

a.)

Intension refers to the schema of the database
i.e. the structure in which the database is
designed / modelled

more
sophisticated
personal

Extension refers to the current records / data
present in the database at a particular instance.

So for the given scenario

Intension

The schema of the e-commerce website
is

Products

product-id	name	price	quantity
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extension

The current records stored in the
database at that instant

Products -

101	shirt	599	100
102	pant	799	200
:			
110	scarf	499	50

Q.)

2.)

a) Customer

SQL query:

```
create table customer (customer_id int, customer_name  
varchar2(20), city varchar2(20), phone_number  
varchar2(20), city varchar2(20), phone_number varchar2(10));
```

Movie

SQL query:

```
create table movie (movie_id
```

2.)

a) Customer

```
create table customer (customer_id int, name varchar2(20),  
city varchar2(20), phone_no varchar2(10) int(10),  
constraint pk_cid primary key (customer_id));
```

Movie

```
create table movie (movie_id int, name title varchar2(20),  
genre varchar2(20), price float, constraint pk_mid  
primary key (movie_id));
```

Booking

```
create table booking (booking_id int, customer_id int,  
movie_id int, booking_date date, status varchar2(20),  
constraint primary key pk_bid primary key (booking_id),  
constraint fk_cid foreign key (customer_id) references customer,  
constraint fk_mid foreign key (movie_id) references movie);
```


b.)

select name from customer where customer_id in
(select customer_id from booking where status = 'booked');

select title from movie where movie_id in
(select movie_id from booking where status = 'booked');

c.)

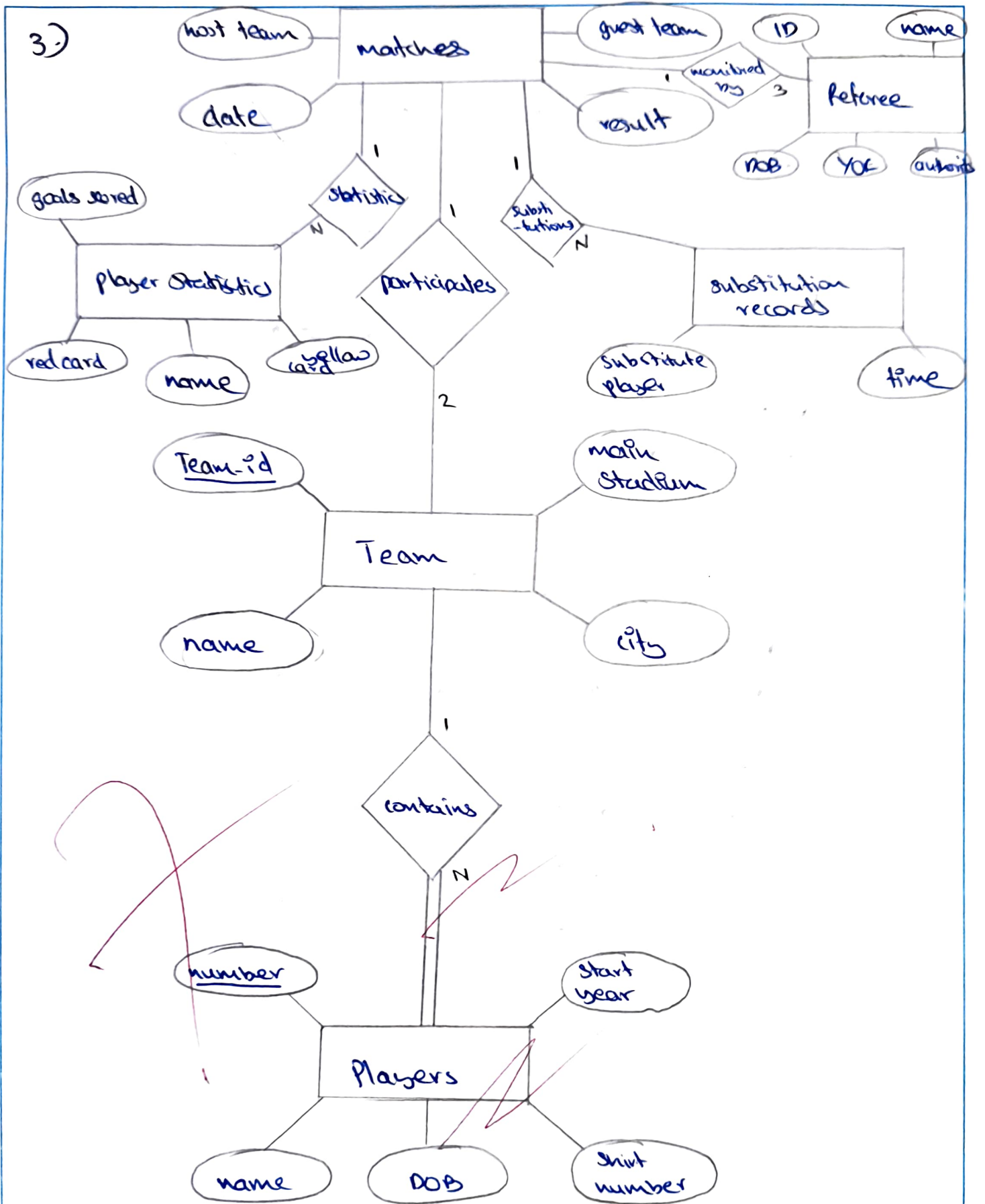
select name from customer where customer_id in
(~~select~~ select customer_id from booking order by date asc);

select title from movie where movie_id in
(select movie_id from booking order by date asc);

d.)

select name, city from customer where customer_id in
(select customer_id from booking where genre = 'comedy');

3.)



4.)

To develop a relational schema for the given database

I construct schema for strong entity sets

E Bus
E Route
E Bus stops
Driver
E Trip
E system users
WE Bypass

Bus

Bus-id vehicle_no vehicle_model status

Route

Route-id Route name

Bus-stops

Busstop-id name address

Driver

Driver-id name years of experience salary

Trip

Trip-id date time academic year

system users

user-id name age

II construct schema for weak entity sets

bus pass

route-id academic year

III mapping 1:1 relationships

assigned

~~pass-id~~ ~~route-id~~ bus

pass-id route-id

stops

Route

has bus pass

user-id route-id

IV mapping 1:N relationships

assigned

bus-id Route-id

stops

stop-id Route-id

trips

trip-id Route-id

to

V mapping m:n relationship

handles

driver-id bus-id

VI mapping multivalued attributes

there are no multivalued attributes

VII mapping n-ary relationships

trips

trip-id Bus-id Route-id driver-id

VIII mapping EER entities

user

user-id name age

student

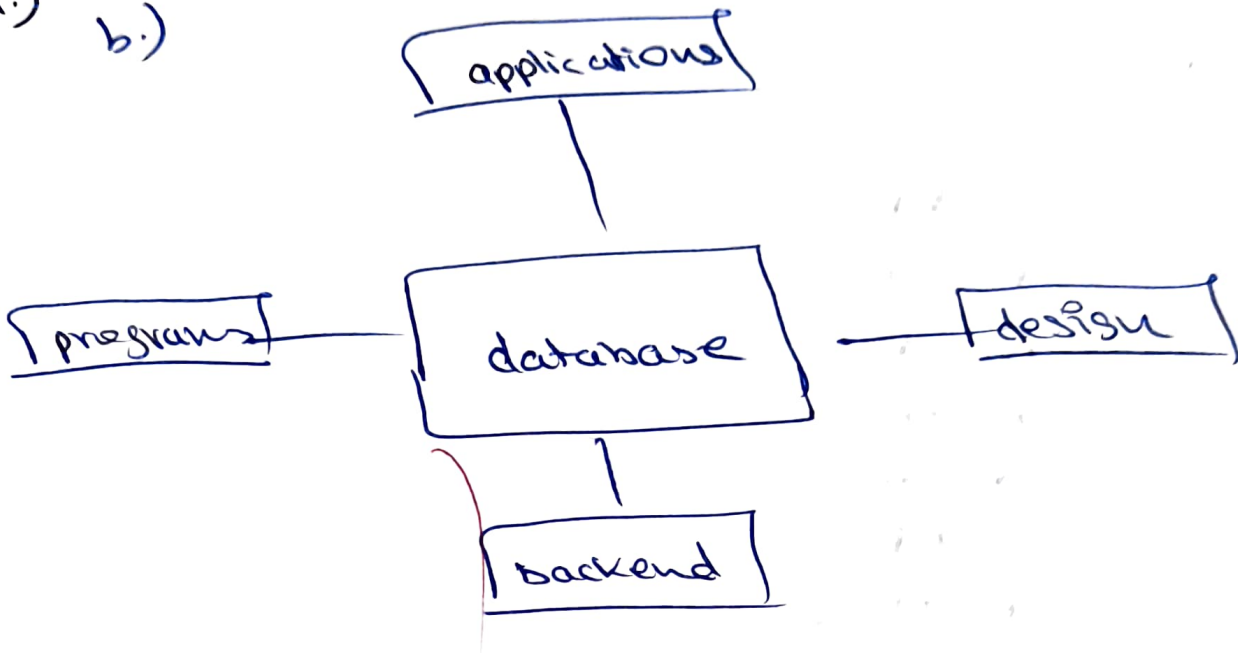
user-id rollno

teacher

user-id faculty-no

1.)

b.)



Roles

Database administrator

manages access of database

Database designer

designs the layout of database

Database user

Users who have access to view

database types

→ naive

→ sophisticated

etc

5.)

$F = \{$

$A \rightarrow BC$

$B \rightarrow BD$

$CD \rightarrow E$

$A \rightarrow D$

$E \rightarrow F$

$AF \rightarrow G$

$C \rightarrow D$

$D \rightarrow E \}$

a.) making closure set for current FDs

$A^+ = \{A, B, C, D, E, F, G\}$

$B^+ = \{B, D, E, F\}$

$C^+ = \{C, D, E, F\}$

$D^+ = \{D, E, F\}$

$E^+ = \{E, F\}$

$F^+ = \{F\}$

$G^+ = \{G\}$

b) making singleton FDs

new FDs

$$A \rightarrow B @$$

~~FD~~

$$A \rightarrow C$$

$$B \rightarrow D$$

$$C \rightarrow E$$

$$A \rightarrow D$$

$$E \rightarrow F$$

$$AF \rightarrow G$$

$$C \rightarrow D$$

$$D \rightarrow E$$

II Removing extraneous attributes

$$A \rightarrow B$$

$$A \rightarrow C$$

$$B \rightarrow D$$

$$C \rightarrow E \quad [\because D \subseteq C]$$

$$A \rightarrow D$$

$$E \rightarrow F$$

$$A \rightarrow G \quad [\because A \subseteq AF \subseteq A]$$

$$C \rightarrow D$$

$$D \rightarrow E$$

III Finding redundant FDS by removing

(i) $A \rightarrow B$

$$A^+ = \{A, C, D, E, F, G\}$$

$A \rightarrow B$ is mandatory

(ii) $A \rightarrow C$

$$A^+ = \{A, B, D, E, F, G\}$$

$A \rightarrow C$ is mandatory

(iii) $B \rightarrow D$

$$B^+ = \{B\}$$

$B \rightarrow D$ is mandatory

(iv) $C \rightarrow E$

$$C^+ = \{C, D, E, F\}$$

$C \rightarrow E$ is redundant

(v) $A \rightarrow D$

$$A^+ = \{A, B, C, D, E, F, G\}$$

$A \rightarrow D$ is redundant

(vi) $E \rightarrow F$

$$E^+ = \{E\}$$

$E \rightarrow F$ is mandatory

(vii) $A \rightarrow G$

$$A^+ = \{A, B, C, D, E, F\}$$

$A \rightarrow G$ is mandatory

(viii) $C \rightarrow D$

$$C^+ = \{C\}$$

$C \rightarrow D$ is mandatory

(ix) $D \rightarrow E$

$$D^+ = \{D\}$$

$D \rightarrow E$ is mandatory.

Final FDs for (minimal) canonical cover

$$A \rightarrow B$$

$$A \rightarrow C$$

$$B \rightarrow D$$

$$E \rightarrow F$$

$$A \rightarrow G$$

$$C \rightarrow D$$

$$D \rightarrow E$$

//

candidate key is A //