Q.3. Create a CLIENT-MAST table whose structure is :

Column Name	Data Type	Size
Client-no	Varchar	5
Name	Char	15
Address1	Varchar	20
Address2	Varchar	20
City	Char	15
State	Char	15
Pin code	Number	6
Ph-no	Number	10
Bal-due	Number	10, 2

Ans. CREATE TABLE CLIENT-MAST

(Client-no varchar (5), Name char (15), Address1 varchar (20), Address2 varchar (20), City char (15), State char (15), Pin code number (6), Ph-no number (10), Bal-due number (10, 2));

Output : Table created.

Q.4. Create a PRODUCT_MAST whose structure is :

Column Name	Data Type	Size
Product-no	Varchar	5
Description	Varchar	30
Profit-perc	Number	4, 2
Unit	Varchar	10
Qty-available	Number	9
Sell-price	Number	9, 2
Cost-price	Number	9, 2

Ans. CREATE TABLE PRODUCT_MAST

(Product-no varchar (5), Description varchar (30), Profit-perc number (4, 2), Unit varchar (10), Qty-available number (9), Sell-price number (22), Cost-price number (9, 2));

Output : Table created.

□

Lab-2

Q. 1. Insert the values into student table :

INSERT INTO STUDENT VALUES
   (&Roll-no, &Name, &Age, &Sex, &Branch, &Ph-no, &Address, &City, &State, &Pincode);

Ans.

Enter values for Roll-no	:	1
Enter values for Name	:	Vijay Krishna
Enter values for Age	:	28
Enter values for Sex	:	M
Enter values for Branch	:	B.Tech.
Enter values for Ph-no	:	9564206
Enter values for Address	:	H-327
Enter values for City	:	Gr. Noida
Enter values for State	:	U.P.
Enter values for Pin code	:	400054

Output : 1 row created.

Q. 2. Insert the values into EMPLOYEE table :

INSERT INTO EMPLOYEE VALUES
   (&Emp-id, &Name, &Sex, &Address, &City, &State, &Dept-no, &Salary);

Ans.

Enter values for Emp-id	:	C0001
Enter values for Ename	:	Vijay Krishna
Enter values for Sex	:	M
Enter values for Address	:	H-327
Enter values for City	:	Allahabad
Enter values for Stage	:	U.P.
Enter values for Dept-no	:	CS 10
Enter values for Salary	:	30000

Output : 1 row created.

Q.3. INSERT INTO CLIENT-MAST VALUES
   (&Client-no, &Name, &Address1, &Address2, &City, &State, &Pincode, &Ph-no, &Bal-due);

Q.4. INSERT INTO PRODUCT-MAST VALUES
   (&Product-no, &Description, &Profit, &Unit, &Qty-available, &Sell-price, &Cost-price).

☐

| Lab-3 |

Retrieve the records from the tables :

Q. 1. (a) Find out the roll-no, names of all the students.

(b) Retrieve the entire contents of the student table.

(c) Retrieve the list of names, address, branch, city of all the students.

(d) List all the students whose state are Delhi.

Ans. (a) SELECT roll-no, name from student;

(b) SELECT * from student;

(c) SELECT name, address, branch, city from student;

(d) SELECT * from student

WHERE State = 'Delhi';

Q. 2. (a) Find out the names, client-no of all the clients.

(b) Retrieve the entire contents of the CLIENT-MAST table.

(c) List all the clients who are located in NEW DELHI.

(d) Find the client-no, names, address1, address2 of the client who have bal-due is greater.

Ans. (a) SELECT client-no, name from CLIENT-MAST;

(b) SELECT * FROM CLIENT-MAST;

(c) SELECT * FROM CLIENT-MAST

WHERE State = 'New Delhi';

(d) SELECT client-no, name, address1, address2 from CLIENT-MAST

WHERE Bal-due > 500;

Q. 3. (a) Change the city of client-no '115A' to 'NEW DELHI'.

(b) Change the bal-due of client-no '118A' to Rs. 5000.

(c) List the various products available from the product-mast table.

(d) Delete all products from PRODUCT-MAST where the quantity available is equal to 200.

(e) Delete from CLIENT-MAST where the column state holds the value 'U.P.'

Ans. (a) UPDATE CLIENT-MAST SET City = 'New Delhi'

WHERE Client-no = '115A';

(b) UPDATE CLIENT-MAST SET Bal-due = 5000

WHERE Client-no = '118A';

(c) SELECT description FROM PRODUCT-MAST;

(d) DELETE FROM PRODUCT-MAST

WHERE Qty-available = 200;

(e) DELETE FROM CLIENT-MAST

WHERE State = 'U.P.';

Q. 4.

(a) Add a column called 'mob-num' of data type 'number' and size = '10' to the CLIENT-MAST table.

(b) Change the size of cost-price column in product-mast to 10, 2.

(c) Destroy the table PRODUCT-MAST along with its data.

(d) Destroy the table client-mast along with its data.

(e) Change the name of the student table to student-mast.

(f) Change the name of the PRODUCT-MAST table to PRO-MASTER.

Ans. (a) ALTER TABLE CLIENT-MAST

   ADD (Mob-num number (10));

(b) ALTER TABLE PRODUCT-MAST

   MODIFY (Cost-price number (10, 2));

(c) DROP TABLE PRODUCT-MAST;

(d) DROP TABLE CLIENT-MAST;

(e) RENAME student to student-mast;

(f) RENAME RPODUCT-MAST TO PRO-MASTER;

☐

Lab-4

Q. 1. Retrieve the contents of the column production-no, description, profit and compute 5% of the values contained in the column sell-price and 105% of the values contained in the field sell-price for each row from the table PRODUCT-MAST.

Ans. SELECT Product-no, description, profit,
             Sell-price * 0.05, Sell-price * 1.05
             FROM PRODUCT-MAST;

Output :

Product-no	Description	Profit	Sell-price * 0.05	Sell-price * 1.05
110A	Hard disk	300	500	9500
111A	DVD writer	400	200	7200
112A	CD writer	200	300	6300
113A	Monitors	700	800	13800
114A	Mouse	100	40	1140

Q. 2. Retrieve the contents of the column product-no, description & compute 5% & 105% of the field sell-price for each row retrived. Rename sell-price * 0.05 as increase and sell-price * 1.05 as new-price.

Ans. SELECT Product-no, description, sell-price * 0.05 increase, sell-price * 1.05 new-price, FROM PRODUCT-MAST;

Output :

Product-no	Description	Increase	New-price
110A	Hard disk	300	9500
111A	DVD writer	400	7200
112A	CD writer	200	6300
113A	Monitors	700	13800
114A	Mouse	100	1140

Q. 3. Retrieve the contents of columns product-no, description, profit, sell-price, cost-price from the PRODUCT-MAST table where the values contained in the field profit is between 500 & 1000 both inclusive.

Ans. SELECT product-no, description, profit, sell-price, cost-price
             FROM PRODUCT-MAST
             WHERE Profit > = 500 AND Profit < = 1000;

Q. 4. Retrieve employee information like emp-id, ename, address, city, state, dept-no and salary for all the employee where the field salary has 10000 or 15000.

Ans. SELECT Emp-id, ename, address, city, state, dept-no, salary
             FROM EMPLOYEE
             WHERE (Salary = 10000 OR Salary = 15000);

Q. 5. Retrieve specified employee information for employee who are NOT in 'NEW DELHI' or 'NOIDA'.

Ans. SELECT Emp-id, ename, address, city, state, dept-no, salary

                FROM EMPLOYEE

WHERE NOT (City = 'NEW DELHI' OR City = 'NOIDA');

Q. 6. Retrieve roll-no, name, age, branch, ph-no, address, city, state from the table student where the values contained within the field roll-no is between 15 and 50 both inclusive.

Ans. SELECT roll-no, name, age, branch, ph-no, address, city, state

                FROM STUDENT

                WHERE Roll-no 15 AND 50;

Q. 7. Retrieve emp-id, ename, address, city, salary from the EMPLOYEE table where the values contained in the field emp-id are not between 115 and 130 both inclusive.

Ans. SELECT emp-id, ename, address, city, salary

                FROM EMPLOYEE

WHERE emp-id NOT BETWEEN 115 AND 130;

Q. 8. Retrieve the roll-no, name, address, city and state from the table student where the student name is either Vijay or Gopal or Saurabh or Raja or Sanjay.

Ans. SELECT Roll-no, name, address, city, state FROM student

WHERE Name IN ('Vijay', 'Gopal', 'Saurabh', 'Raja', 'Sanjay');

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| **Lab-5** |

Q. 1. Create a table CLIENT-MAST such that the contents of the column client-no are uniquekey across the entire column.

Ans. CREATE TABLE CLIENT-MAST

(Client-no, varchar (7) UNIQUE, Name char (15), Address varchar (30), City char (15), State char (15), Bal-due number (9, 2));

Q. 2. Create a table student such that the contents of the column roll-no are primary key across the entire column.

Ans. CREATE TABLE Student

(Roll-no number (7) PRIMARY KEY, Name char (15), Branch char (15), Address varchar (30), City char (15), State char (15));

Q. 3. Create a table SALES-MAST where there is a composite primary key on the column order-no and product-no. Since the constraint spans across columns, describe in at table level.

Column Name	Data Type	Size
Order-no	Varchar	5
Product-no	Varchar	5
Rate	Number	(8, 2)
Product-name	Char	15
Qty-order	Number	7

Ans. CREATE TABLE SALES-MAST

(Order-no varchar (5), Product-no varchar (5), Rate number (8, 2), Product-name char (15), Qty-order number (7), PRIMARY KEY (Order-no, product-no));

Q. 4. Create a table CLIENT-MAST with the following constraints :

(i) Data values being inserted into the column name should be in lower case only.

(ii) Data values being inserted the column client-no must start with the small letter 'a'.

(iii) Only allow "Delhi", "Noida", Greater Noida" as legitimate values for the column city.

Ans. CREATE TABLE CLIENT-MAST

(Client-no varchar (5), Name char (15), Address varchar (30), City char (15), State char (15), Bal-due number (9, 2), CHECK (Client-no like 'a%'), CHECK (Name = lower (name)), CHECK (City IN ('Delhi', 'Noida', 'Greater Noida')));

Q. 5. Create a table CLIENT-MAST with following check constraints :

(i) Data values being inserted into the column client-no must start with the capital letter 'A'.

(ii) Data values being inserted into the column name should be in upper case only.

(iii) Only allow "Noida", "Delhi", "Greater Noida", "Allahabad".

Ans. CREATE TABLE CLIENT-MAST

(Client-no varchar (7), Name char (15), Address varchar (30), City char (15), State char (15), Bal-due number (10, 2), CHECK (Client-no like 'A%'), CHECK (Name = Upper (Name)), CHECK (City IN ('Noida', 'Delhi', 'Greater Noida', 'Allahabad')));

Q. 6. Create a table sales-order1 table with its primary key as deltorder-no and product-no. The foreign key is deltorder-no, referencing column order-no in the sales-order table.

Ans. CREATE TABLE Sales-order 1
(Deltorder-no varchar (6), REFERENCES sales-order, Product-no varchar (5), Qty number (7), Rate number (8, 2), PRIMARY KEY (Deltorder-no, Product-no));

Q. 7. Create the table described below :

Table Name : CLIENT-MAST

Column Name	Data Type	Size	Attributes
Client-no	Varchar	6	Primary key first latter must start with A
Name	Varchar	20	
Address	Varchar	30	NOT NULL
City	Char	15	
State	Char	15	
Bal-due	Number	8, 2	

Ans. CREATE TABLE CLIENT-MAST
(Client-no varchar (6) PRIMARY KEY, Name char (20) NOT NULL, Address varchar (30), City Char (15), State char (15), Bal-due number (8, 2), CONSTRAINT CK_Client CHECK (Client-no like 'A%'));

Q. 8. Create the table described below :

Table Name : PRODUCT_MAST

Column Name	Data Type	Size	Attribtues
Product-no	Varchar	6	Primary key/First letter must start with A
Product-name	Char	20	NOT NULL
Sell-price	Number	8, 2	NOT NULL cannot be 0
Cost-price	Number	8, 2	NOT NULL cannot be 0
Profit-no	Number	4, 2	NOT NULL

Ans. CREATE TABLE PRODUCT-MAST
(Product-no varchar (6) PRIMARY KEY, Product-name char (20) NOT NULL, Sell-price number (8, 2) NOT NULL, Cost-price number (8, 2) NOT NULL, Profit-number (4, 2) NOT NULL, CONSTRAINT CK-product CHECK (Product-no like 'A%'), CONSTRAINT CK-sell CHECK (Sell-price < > 0), CONSTRAINT CK-cost CHECK (Cost-price < > 0));

Q. 9. Table Name : SALES-MAST

Column Name	Date Type	Size	Attributes
ID	Varchar	6	Primary key/First letter must start with 'M'
Name	Char	20	NOT NULL
Address	Varchar	30	NOT NULL
City	Char	15	
State	Char	15	
Salary	Number	(8, 2)	NOT NULL cannot be 0

Ans. CREATE TABLE SALES-MAST
(ID varchar (6) PRIMARY KEY, Name char (20) NOT NULL, Address varchar (30) NOT NULL, City char (15), State char (15), Salary number (8, 2) NOT NULL, CONSTRAINT CK-sales CHECK (ID like 'M%'), CONSTRAINT CK-sales CHECK (Salary < > 0));

<div style="border:1px solid black">**Lab-6**</div>

Q. 1. Insert the following data into their respective tables.

Data for CLIENT-MAST table

Client-no	Name	Address	City
A0001	Vijay Krishna	H-327	˜ Delhi
A0002	Santosh Kumar	F-119	Noida
A0003	Gopal Krishna	L-62	Noida
A0004	Sanjay Kumar	L-179	New Delhi
A0005	Saurabh Kumar	H-310	Gr. Noida
A0006	Raja Kumar	H-431	Varanasi

State	Bal-due
Delhi	3000.00
U.P.	5000.00
U.P.	4500.80
Delhi	5000.90
U.P.	1500.35
U.P.	1000.00

Ans. INSERT INTO CLIENT-MAST
(Client-no, Name, Address, City, State, Bal-due)
VALUES ('A0001', 'Vijay Krishna', 'H-327', 'Delhi', 'Delhi', 3000.00);

INSERT INTO CLIENT-MAST
(Client-no, Name, Address, City, State, Bal-due)
VALUES ('A0002', 'Santosh Kumar', 'F-119', 'Noida', 'U.P.', 5000.00);

INSERT INTO CLIENT-MAST
(Client-no, Name, Address, City, State, Bal-due)
VALUES ('A0003', 'Gopal Krishna', 'L-62', 'Noida', 'U.P.', 4500.80);

INSERT INTO CLIENT-MAST
(Client-no, Name, Address, City, State, Bal-due)
VALUES ('A0004', 'Sanjay Kumar', 'L-179', 'New Delhi', 'Delhi', 5000.90);
INSERT INTO CLIENT-MAST
(Client-no, Name, Address, City, State, Bal-due)
VALUES ('A0005', 'Saurabh Kumar', 'H-310', 'Gr. Noida', 'U.P.', 1500.30);

INSERT INTO CLIENT-MAST
(Clicnt-no, Name, Address, City, State, Bal-due)
VALUES ('A0006', 'Raja Kumar', 'H-431', 'Varanasi', 'U.P.', 1000.00);

Q.2. Insert the following data into their respective table :

Data for PRODUCT-MAST table

Product-no	Prod-name	Profit-per	Sell-price	Cost-price
A0001	Monitors	6	12000	11280
A0002	HDD	4	8000	8000
A0003	CD writer	2.5	5250	5100
A0004	Mouse	5	1050	1000
A0005	Keyboard	10	3150	3050
A0006	Floppies drive	5	1050	1000

Ans. INSERT INTO PRODUCT-MAST
    (Product-no, Prod-name, Profit-per, Sell-price, Cost-price)
    VALUES ('A0001', 'Monitors', 6, 12000, 11280);
Output : 1 row created.

INSERT INTO PRODUCT-MAST
    (Product-no, Prod-name, Profit-per, Sell-price, Cost-price)
    VALUES ('A0002', 'HDD', 4, 8400, 8000);
Output : 1 row created.

INSERT INTO PRODUCT-MAST
    (Product-no, Prod-name, Profit-per, Sell-price, Cost-price)
    VALUES ('A0003', 'CD writer', 2.5, 5250, 5100);
Output : 1 row created.

INSERT INTO PRODUCT-MAST
    (Product-no, Prod-name, Profit-per, Sell-price, Cost-price)
    VALUES ('A0004', 'Mouse', 5, 1050, 1000);
Output : 1 row created.

INSERT INTO PRODUCT-MAST
    (Product-no, Prod-name, Profit-per, Sell-price, Cost-price)
    VALUES ('A0005', 'Keyboard', 10, 3150, 3050);
Output : 1 row created.

INSERT INTO PRODUCT-MAST
    (Product-no, Prod-name, Profit-per, Sell-price, Cost-price)
    VALUES ('A0006', 'Floppies Drive', 5, 1050, 1000);
Output : 1 row created.

Q. 3. Insert the following data into their respective table :
Data for SALES-MAST

ID	Name	Address	City	State	Salary
M0001	Vijay Krishna	H-327	Delhi	Delhi	30,000
M0002	Gopal Krishna	L-62	Noida	U.P.	30,000
M0003	Shitesh Kumar	H-431	Gr. Noida	U.P.	25,000
M0004	Saurabh	F-530	Gr. Noida	U.P.	25,000
M0005	Raja Kumar	G-300	Noida	U.P.	25,000
M0006	Sanjay Kumar	N-310	Delhi	Delhi	20,000

Ans. INSERT INTO SALES-MAST
(ID, Name, Address, City, State, Salary)
VALUES ('M0001', 'Vijay Krishna', 'H-327', 'Delhi', 'Delhi', 30000);
Output : 1 row created.

INSERT INTO SALES-MAST
(ID, Name, Address, City, State, Salary)
VALUES ('M0002', 'Gopal Krishna', 'L-62', 'Noida', 'U.P.', 30000);
Output : 1 row created.

INSERT INTO SALES-MAST
(ID, Name, Address, City, State, Salary)
VALUES ('M0003', 'Shitesh Kumar', 'H-431', 'Gr. Noida', 'U.P.', 25000);
Output : 1 row created.

INSERT INTO SALES-MAST
(ID, Name, Address, City, State, Salary)
VALUES ('M0004', 'Saurabh', 'F-530', 'Gr. Noida', 'U.P.', 25000);
Output : 1 row created.

INSERT INTO SALES-MAST
(ID, Name, Address, City, State, Salary)
VALUES ('M0005', 'Raja Kumar', 'G-300', 'Noida', 'U.P.', 25000);
Output : 1 row created.

INSERT INTO SALES-MAST
(ID, Name, Address, City, State, Salary)
VALUES ('M0006', 'Sanjay Kumar', 'N-310', 'Delhi', 'Delhi', 20000);
Output : 1 row created.

Lab-7

Q. 1. Give every employee a bonus of 20%. Calculate the 20% amount based on the value held in the column salary of employee table and update the values held the column net-salary.

Ans. UPDATE Employee

SET Net-salary = Net-salary * Salary * 0.20;

Q. 2. Update the table SALES-MAST change the contents of the field name to 'Vijay Kumar' and the contents of the field address to G-119 Jay Apartments for the record identified by the field ID containing the value 'M0001'.

Ans. UPDATE SALES-MAST

SET Name = 'Vijay Kumar',

Address = 'G-119 Jay Apartments'

WHERE ID = 'M0001';

Q. 3. Add the field's mobile-no, which is a field that can hold a number upto 10 digits in length in student table.

Ans. ALTER TABLE Student

ADD (Mobile-no number (10));

Q. 4. Modify the field mobile-no of the table student to new hold a maximum of 12 digits values.

Ans. ALTER TABLE Student

MODIFY (Mobile-no number (12));

Q. 5. Retrieve all the information about the salesman whose names begin with the letters 'Sa' from SALES-MAST table.

Ans. SELECT * FROM SALES-MAST

WHERE Name LIKE 'Sa%';

Q. 6. Retrieve all the information about the student whose names begin with letter 'V' from student table.

Ans. SELECT * FROM Student

where Name LIKE 'V%';

Q. 7. Retrieve Roll-no, Name, Address, City, State about the student where second character of names are either 'a' or 'i'.

Ans. SELECT Roll-no, Name, Address, City, State from student

WHERE Name LIKE '–a%' OR Name LIKE '–i%';

	Lab-8	

Q. 1. Create a table SUPPLIER_MAST from CLIENT-MAST. Select all fields, rename client-no with supplier-no and name with sname.

Ans. CREATE TABLE SUPPLIER-MAST

(Supplier-no, Sname, Address, City, State, Bal-due)

AS SELECT Client-no, Name, Address, City, State, Bal-due FROM CLIENT-MAST;

Q. 2. Create a table EMP-NAME from employee. Select all the fields, rename emp-id with EMP-ID and Ename with Emp-name.

Ans. CREATE TABLE EMP-MASTER

(Emp-ID, Emp-name, Sex, Address, City, State, Dept-no, Salary)

AS SELECT Emp-Id, Ename, Sex, Address, City, State, Dept-no, Salary FROM Employee;

Q. 3. Insert records into table SUPPLIER-MAST from the table CLIENT-MAST.

Ans. INSERT INTO SUPPLIER-MAST

SELECT Client-no, Name, Address, City, State, Bal-due

FROM CLIENT-MAST;

Q. 4. Insert records into table EMP-MASTER from the table employee.

Ans. INSERT INTO EMP-MASTER

SELECT Emp-id, Ename, Sex, Address, City, State, Salary

FROM Employee;

Lab-9

Q. 1.   Table Name : SALES-ORDER

Order No	Client_No	Order_Date
B0001	A0001	10-Jan-07
B0002	A0001	12-Feb-07
B0003	A0003	24-May-07
B0004	A0004	30-Jun-07
B0005	A0005	12-July-07
B0006	A0006	15-Aug-07

Table Name : CLIENT-MAST

Client-No	Name	Bal-due
A0001	Vijay Krishna	500
A0002	Gopal Krishna	1000
A0003	Santosh Kumar	300
A0004	Saurabh Kumar	700
A0005	Shitesh Kumar	800
A0006	Raja Kumar	200

Retrive all orders placed by a Client-name 'Vijay Krishna' from the SALES-ORDER table.

Ans. SELECT * FROM SALES-ORDER

WHERE Client-no = (SELECT Client-no FROM CLIENT- MAST/WHERE Name = 'Vijay Krishna');

Output :

Order-No	Client-No	Order-date
B0001	A0001	10-Jan-07
B0002	A0001	12-Feb-07

Q. 2. Find out all the products that are not being sold from the PRODUCT-MAST table, based on the products actually sold as shown in the SALES-ORDER table.

Table Name : SALES-ORDER

Detorder-no	Product-no	Qty-order
D0001	A0001	10
D0001	A0002	4
D0001	A0003	5
D0002	A0005	8
D0002	A0001	7
D0003	A0002	5
D0004	A0005	4
D0005	A0003	6
D0006	A0005	7

Table Name : PRODUCT-MAST

Product-no	Prod-name
A0001	Monitors
A0002	HDD
A0003	CD writer
A0004	Mouse
A0005	Keyboard
A0006	Floppies drive
A0007	Floppies

Ans. SELECT Product-no, Prod-name
FROM PRODUCT-MAST
WHERE Product-no NOT IN
(SELECT Product-no FROM SALES-ORDER);

Output :

Product-no	Prod-name
A0004	Mouse
A0006	Floppies drive
A0007	Floppies

Q. 3. Retrieve the product numbers and the total quantity ordered for each product from the SALES-ORDER table.

Table Name : SALES-ORDER

Detorder-no	Product-no	Qty-order
D0001	A0001	7
D0001	A0004	9
D0001	A0006	8
D0002	A0002	3
D0002	A0002	4
D0003	A0005	6
D0004	A0003	4
D0005	A0001	3
D0005	A0006	2
D0006	A0004	9

Ans. SELECT Product-no, Sum (Qty-order)
"Total Qty ordered"
FROM SALES-ORDER
GROUP BY Product-no;

Output :

Product-no	Total Qty-order
A0001	10
A0002	7
A0003	4
A0004	18
A0005	6
A0006	10

Q.4. Retrieve the product-no and the total quantity ordered for product-no 'A0002', 'A0006' from SALES-ORDER table.

Table Name : SALES-ORDER

Detorder	Product-no	Qty-order
D0001	A0001	7
D0002	A0004	9
D0002	A0006	8
D0001	A0002	3
D0003	A0002	4
D0002	A0005	6
D0004	A0003	4
D0005	A0001	3
D0005	A0006	2
D0006	A0004	9

Ans. SELECT Product-no, Sum (Qty-order)
"Total Qty order"
FROM SALES-ORDER
GROUP BY Product-no
HAVING Product-no = 'A0002' OR
Product-no = 'A0006';

Output :

Product-no	Total Qty Order
A0002	7
A0006	10

Q. 5. Retrieve the order number, client-no and salesman-no where a client has been serviced by more than one salesman from the SALES-ORDER table.

Table Name : SALES-ORDER

Order-no	Client-no	Salesman-no
D0001	A0006	S0002
D0002	A0002	S0001
D0003	A0007	S0004
D0004	A0005	S0003
D0005	A0002	S0003
D0006	A0007	S0002

Ans. SELECT first.Order-no, first.Client-no, first.Salesman-no

FROM SALES-ORDER first,

SALES-ORDER second

WHERE first.Client-no = second.Client-no

AND first.Salesman-no < > second.Salesman-no;

Table Name : First

Order-no	Client-no	Salesman-no
D0001	A0006	S0002
D0002	A0002	S0001
D0003	A0007	S0004
D0004	A0005	S0003
D0005	A0002	S0003
D0006	A0007	S0002

Table Name : Second

Order-no	Client-no	Salesman-no
D0001	A0006	S0002
D0002	A0002	S0001
D0003	A0007	S0004
D0004	A0005	S0003
D0005	A0002	S0003
D0006	A0007	S0002

Output :

Order-no	Client-no	Salesman-no
D0005	A0002	S0003
D0002	A0002	S0001
D0006	A0007	S0002
D0003	A0007	S0004

	Lab-10	

– **Q. 1.** Retrieve the names of all the clients and salesman in the city of 'New Delhi' from the tables CLIENT-MAST and SALES-MAST.

Table Name : CLIENT-MAST

Client-no	Name	City
A0001	Vijay Krishna	New Delhi
A0002	Santosh Kumar	Noida
A0003	Gopal Krishna	New Delhi
A0004	Saurabh Kumar	Gr. Noida
A0005	Sitesh Kumar	New Delhi
A0006	Raja Rai	Gr. Noida
A0007	Sanjay Kumar	New Delhi
A0008	Deepak	Gr. Noida

Table Name : SALES-MAST

Salesman-no	Name	City
B0001	Puneet Kumar	Varanasi
B0002	Pravin Kumar	Varanasi
B0003	Radha Krishna	New Delhi
B0004	Nitesh Kumar	Allahabad
B0005	Brijesh Kumar	Noida
B0006	Tushar Kumar	Allahabad
B0007	Nitin Kumar	Varanasi
B0008	Mahesh Kumar	Gr. Noida

Ans. SELECT Client-no "ID", Name

FROM CLIENT-MAST

WHERE City = 'New Delhi'

Union : SELECT Salesman-no "ID", Name

FROM SALES-MAST

WHERE City = 'New Delhi';

Output :

ID	Name
A0001	Vijay Krishna
A0003	Gopal Krishna
A0005	Sitesh Kumar
A0007	Sanjay Kumar
B0003	Radha Krishna

Q. 2. Retrieve the salesman name in 'New Delhi' whose efforts have resulted into atleast one sales transaction.

Table Name : SALES-MAST

Salesman-no	Name	City
B0001	Puneet Kumar	Varanasi
B0002	Pravin Kumar	Varanasi
B0003	Radha Krishna	New Delhi
B0004	Brijesh Kumar	New Delhi
B0005	Tushar Kumar	Allahabad
B0006	Nitin Kumar	Allahabad
B0007	Mahesh Kumar	Gr. Noida

Table Name : SALES-ORDER

Order-no	Order-date	Salesman-no
S0001	10-Apr-07	B0001
S0002	28-Apr-07	B0002
S0003	05-May-07	B0003
S0004	12-June-07	B0004
S0005	15-July-07	B0005
S0006	18-Aug-07	B0006

Ans. SELECT Salesman-no, Name FROM SALES-MAST
        WHERE City = 'New Delhi'
        INTERSECT
SELECT SALES-MAST.Salesman-no, Name
      FROM SALES-MAST, SALES-ORDER
       WHERE SALES-MAST.Salesman-no
        = SALES-ORDER.Salesman-no;

Output :

Salesman-no	Name
A0003	Radha Krishna
A0004	Brijesh Kumar

Q. 3. Retrieve all the product numbers of non-moving items from the PRODUCT-MAST table.

Table Name : SALES-ORDER

Order-no	Product-no
S0001	A0001
S0001	A0004
S0001	A0006
S0002	A0002
S0002	A0005
S0003	A0003
S0004	A0001
S0005	A0006
S0005	A0004
S0006	A0006

Table Name : PRODUCT-MAST

Product-no	Prod-name
A0001	Monitors
A0002	Mouse
A0003	HDD
A0004	CD writer
A0005	DVD writer
A0006	Keyboard
A0007	Floppies driver
A0008	Floppies

Ans. SELECT Product-no FROM PRODUCT-MAST
MINUS
SELECT Product-no FROM SALES-ORDER;
Output :

Product-no
A0007
A0008

Lab-11

Q. 1. *(i) Find the names of all clients having 'a' as the second letter in their names.*

(ii)   Find out the Name, City, State of all clients having 'V' as the first letter in their names.

(iii) Find the list of all clients who live in 'New Delhi' or 'Noida'.

(iv)   Find the information from SALES-ORDER table for order placed in month March.

Ans.

(i)   SELECT Name FROM CLIENT-MAST

                WHERE Name LIKE '–a%';

(ii)   SELECT Name City, State

                FROM CLIENT-MAST

                WHERE Name LIKE 'V%';

(iii) SELECT Client-no, Name, Address, City, State

                FROM CLIENT-MAST

                WHERE City IN ('New Delhi', 'Noida');

(iv)   SELECT * FROM SALES-MAST

        WHERE to-char (Order-date, 'MON') = 'Mar';

Q. 2. *(i) Count the total number of orders from the SALES-ORDER table.*

(ii)   Calculate the average sell-price of all the products from PRODUCT-MAST table.

(iii) Determine the maximum and minimum sell-price. Rename the output as MAX-PRICE and MIN-PRICE respectively.

(iv)   Count the number of products having sell-price greater than or equal to 2000. From the PRODUCT-MAST table.

Ans.

(i)   SELECT COUNT (Order-no)

                FROM SALES-ORDER;

(ii)   SELECT AVG (Sell-price)

                FROM PRODUCT-MAST;

(iii) SELECT MAX (Sell-price) MAX-PRICE

                MIN (Sell-price) MIN-PRICE

                FROM PRODUCT-MAST;

(iv)   SELECT COUNT (Product-no)

                FROM PRODUCT-MAST

                WHERE Sell-price > = 2000;

Q. 3. *(i) Display the order number and day on which clients placed their order for SALES-ORDER table.*

(ii)   Display the month (in alphabets) and date when the order must be delivered for SALES-ORDER table.

(iii) Display the order-date in the format 'DD-Month-YY' in SALES-ORDER table.

(iv)   Find the date, 15 days after today's date.

Ans.

(i)   SELECT Order-no, to-char (Order-date, 'day')
                 FROM SALES-ORDER;

(ii)   SELECT to-char (dely-date, 'month'), dely-date
                 FROM SALES-ORDER
            ORDER BY to-char (dely-date, 'month');

(iii) SELECT to-char (Order-date, 'DD-MM-YY')
                 FROM SALES-ORDER;

(iv)   SELECT Sysdate + 15
                    FROM dual;

□

<div style="text-align:center">**Lab-12**</div>

Q. 1. Write a PL/SQL block code that first inserts a record in an EMPLOYEE table. Update the salaries of Vijay and Santosh by Rs. 12000 and Rs. 3000. Then check to see that the total salary does not exceed Rs. 30000. If the total salary is greater that 30000 then undo the updates made to the salaries of Vijay & Santosh.

<div style="text-align:center">Table Name : EMPLOYEE</div>

Emp-no	Ename	Salary
E0001	Gopal	5000
E0002	Vijay	10000
E0003	Sanjay	5000
E0004	Santosh	2000

Ans. DECLARE
        total-salary number (10);
    BEGIN
        INSERT INTO EMPLOYEE
        VALUES ('E005', 'Raja', 1500);
    SAVEPOINT no-update;
    UPDATE EMPLOYEE SET Salary = Salary + 12000
        WHERE Ename = 'Vijay';
    UPDATE EMPLOYEE SET
        Salary = Salary + 3000
        WHERE Ename = 'Santosh';
/* Selecting total salary from EMPLOYEE table */
    SELECT Sum (Salary) INTO total-salary
        FROM EMPLOYEE;
    IF Total-salary > 30000 THEN
        ROLL BACK To Savepoint no-update;
        END IF;
        COMMIT;
    END;

Q. 2. The HR manager has decided to increase the salary of employees by 20%. Write a PL/SQL block to accept the employee number and update the salary of that employee display appropriate message based on the existence of the record in the EMPLOYEE table.

Ans. BEGIN
        UPDATE EMPLOYEE SET Salary = Salary * 0.20
        WHERE Emp-code = & Emp-code;
    IF SQL % FOUND THEN
        dbms_output.put_line ('Employee record modified successfully');
        Else
        dbms_output.put_line ('Employee no does not exist');
        END IF;
    END;

Q. 3. The HR manager has decided to raise the salary of employees by 20%. Write a PL/SQL block to accept the employee number and update the salary of that employee. Display appropriate message based on the existence of the record NOT found in the employee table.

Ans. BEGIN

```
    UPDATE EMPLOYEE SET Salary = Salary * 0.20
            WHERE emp-code = & emp-code;
    IF SQL % NOT FOUND THEN
            dbms_output.put_line ('Employee no does not exist');
    Else
            dbms_output.put_line ('Employee record modified
                                            successfully');
            END IF;
    END.
```

Lab-13

Q. 1. The HR manager has decided to raise the salary for all the employees in department number 30 by 0.25. Whenever any such raise is given to the employees, a record for the same is maintained in the EMPLOYEE-RAISE table. It includes the employee number, the date when the raise was given and the actual raise. Write a PL/SQL block to update the salary of each employee and insert a record in the EMPLOYEE-RAISE table.

Ans. DECLARE
    CURSOR C-emp IS SELECT emp-code, salary FROM EMPLOYEE
        WHERE Dep-no = 30;
    Str-emp-code EMPLOYEE.emp-code % type;
    num-salary EMPLOYEE.salary % type;
BEGIN
    OPEN, C-emp;
IF C-emp % IS OPEN THEN
    LOOP
    FETCH C-emp INTO Str-emp-code, num-salary;
    exit when C-emp % NOT FOUND;
    UPDATE EMPLOYEE SET
        Salary = num-salary + (num-salary * 0.25)
    WHERE emp-code = Str-emp-code;
INSERT INTO EMPLOYEE-RAISE
VALUES (Str-emp-code, sysdate, num-salary * 0.25);
END LOOP;
COMMIT;
CLOSE C-emp;
    ELSE
    dbms_output.put_line ('Unable to open cursor');
END IF;
END.

Q. 2. The HR manager has decided to raise the salary for all the employees in department number 30 by 0.25. Whenever any such raise is given to the EMPLOYEES, a record for the same is maintained in the EMP-RAISE table. It includes the employee number, the date when the raise was given and the actual raise. Write a PL/SQL block to update the salary of each employee and insert a record in the EMP-RAISE table.

Ans. DECLARE
        CURSOR e-emp IS SELECT
        emp-code, salary
    FROM EMPLOYEE
        WHERE Dept-no = 30;
    Str-emp-code EMPLOYEE.emp-code % type;
    num-salary EMPLOYEE.salary % type;
    BEGIN
        OPEN e-emp;

```
        LOOP
        FETCH e-emp INTO str-emp-code, num-salary;
IF e-emp % FOUND THEN
        UPDATE EMPLOYEE SET
        Salary = num-salary + (num-salary * 0.25)
        WHERE emp-code = Str-emp-code;
INSERT INTO EMP-RAISE VALUES
        (Str-emp-code, sysdate, num-salary * 0.25);
ELSE
        Exit;
        END IF;
        END LOOP;
        COMMIT;
        CLOSE e-cmp;
END.
```

1. Which of the following is related to information :
   (a) data   (b) communication
   (c) knowledge   (d) all of these
2. Data is :
   (a) a piece of fact   (b) metadata
   (c) information   (d) none of these
3. Which of the following is element of database :
   (a) data   (b) constraints and schema
   (c) relationships   (d) all of these
4. What represent a correspondance between the data elements :
   (a) data   (b) constraints
   (c) relationships   (d) schema
5. Which of the following is an advantage of using database system :
   (a) security enforcement   (b) avoidance of redundancy
   (c) reduced inconsistancy   (d) all of these
6. Which of the following is characteristic of the data in the database :
   (a) independent   (b) secure
   (c) shared   (d) all of these
7. The name of the system database that contains descriptions of data in the database is :
   (a) data dictionary   (b) metadata
   (c) table   (d) none of these
8. Following is the type of metadata :
   (a) Operational   (b) EDW
   (c) Datamart   (d) all of these
9. System catalog is a system-created database that describes :
   (a) database objects   (b) data dictionary information
   (c) user access information   (d) all of these
10. Relationships could be following type :
    (a) one-to-one relationship   (b) one-to-many relationship
    (c) many-to-many relationship   (d) all of these
11. In a file-oriented system there is :
    (a) data inconsistancy   (b) duplication of data
    (c) data dependance   (d) all of these
12. In a database system there is :
    (a) increased productivity   (b) improved security
    (c) economy of scale   (d) all of these
13. In a database system there is :
    (a) large size of DBMS   (b) increased overall costs
    (c) increased complexity   (d) all of these

14. The DML following functional access to the database :
    (a) retrieve data and/or records
    (b) add (or insert) records
    (c) delete records from database files
    (d) all of these

15. 4 GL has the following components inbuilt in it :
    (a) query languages   (b) report generators
    (c) spread sheets   (d) all of these

16. What separates the physical aspects of data storage from the logical aspects of data representation?
    (a) data   (b) schema
    (c) constraints   (d) relationships

17. What schema defined how and where the data are organised in a physical data storage?
    (a) external   (b) internal
    (c) conceptual   (d) none of these

18. Which of the following schemas defined a view or views of the database for particular user?
    (a) external   (b) internal
    (c) conceptual   (d) none of these

19. A collection of data designed to be used by different people is called?
    (a) database   (b) RDBMS
    (c) DBMS   (d) none of these

20. Which of the following is a characteristics of the data in a database :
    (a) shared   (b) secure
    (c) independent   (d) all of these

21. An object oriented DBMS is capable of holding :
    (a) data and text   (b) picture and images
    (c) voice and video   (d) all of above

22. Which of the following is an object oriented feature?
    (a) inheritance   (b) polymorphism
    (c) abstraction   (d) all of these

23. Immunity of the conceptual schemas to change in the internal schemas is referred to as :
    (a) physical data independence (b) logical data independence
    (c) both (a) and (b)   (d) none of these

24. A physical data model are used to :
    (a) specify overall logical structure of the database
    (b) describe data and its relationship
    (c) higher level description of storage structure and access mechanism
    (d) all of these

25. An object-oriented data models are used to :
    (a) specify overall logical structure of the database
    (b) describe data and its relationship
    (c) higher level description of storage structure and access mechanism
    (d) all of these

26. The relational data model was first introduced by :
    (a) SPARC   (b) E.F. cord
    (c) ANSI   (d) chem
27. The E-R data model was first introduced by :
    (a) SPARC   (b) E.F. cord
    (c) ANSI   (d) chem
28. The father of relation database system is :
    (a) Pascal   (b) C.J. Date
    (c) Dr. Edgar F. cord   (d) none of these
29. Who wrote the paper titled "A relational model of data for large shared data banks"?
    (a) F.R. McFadder   (b) C.J. Date
    (c) Dr. Edgar F. cord   (d) none of these
30. What is the RDBMS terminology for a row?
    (a) tuple   (b) relation
    (c) attribute   (d) domain
31. What is the cardinality of a table with 1000 rows and 10 columns?
    (a) 10   (b) 100
    (c) 1000   (d) none of these
32. What is the cardinality of a table with 5000 rows and 50 columns?
    (a) 10   (b) 50
    (c) 500   (d) 5000
33. Which of the following key in table can uniquely identify a row in a table?
    (a) primary key   (b) alternate key
    (c) candidate key   (d) all of these
34. A table can have only one :
    (a) primary key   (b) alternate key
    (c) candidate key   (d) all of these
35. What are all candidate keys other than the primary keys called?
    (a) secondary keys   (b) alternate keys
    (c) eligible keys   (d) none of these
36. What is the name of attribute or attribute combination of one relation whose values are required
    to match those of the primary key of some other relation?
    (a) candidate key   (b) primary key
    (c) foreign key   (d) matching key
37. What is the RDBMS terminology for column?
    (a) tuple   (b) relation
    (c) attribute   (d) domain
38. What is the RDBMS terminology for table?
    (a) tuple   (b) relation
    (c) attribute   (d) domain
39. What is the RDBMS terminology for legal values that an attribute can have?
    (a) tuple   (b) relation
    (c) attribute   (d) domain

40. What is the RDBMS terminology for the no. of tuples in a relation?
(a) degree
(b) relation
(c) attribute
(d) cardinality

41. What is the RDBMS terminology for the no. of attributes in a relation?
(a) degree
(b) relation
(c) attribute
(d) cardinality

42. Which of the following aspects of data is the concern of a relational database model?
(a) data manipulation
(b) data integrity
(c) data structure
(d) all of these

43. What is the smallest unit of data in the relational model?
(a) data type
(b) field
(c) data value
(d) none of these

44. A functional dependency is a :
(a) many-to-many relationship between two sets of attributes
(b) one-to-one relationship between two sets of attributes
(c) many-to-one relationship between two sets of attributes
(c) none of these

45. Decomposition helps in eliminating some of the problems of bad design such as :
(a) redundancy
(b) inconsistencies
(c) anomalies
(d) all of these

46. The word loss in lossless refers to the :
(a) loss of information
(b) loss of attributes
(c) loss of relations
(d) none of these

47. The set of attribute X will be fully functionally dependent on the set of attribute Y if the following conditions are satisfied :
(a) X is functionally dependent on Y
(b) X is not functionally dependent on any subset of Y
(c) both (a) and (b)
(d) none of these

48. Normalization is a process of :
(a) decomposing a set of relations
(b) successive reduction of relation schema
(c) deciding which attributes in a relation to be grouped together
(d) all of these

49. The normalization process was developed by :
(a) E.F. Codd
(b) R.F. Boyce
(c) R. Fagin
(d) Collin White

50. A normal form is :
(a) a state of relation that results from applying simple rules regarding FDs
(b) the highest normal form condition that it meets
(c) an indication of the degree to which it has been normalised
(d) all of these

51. Which of the following is the formal process of deciding which attributes should be grouped together in a relation?
(a) optimization   (b) normalization
(c) tuning   (d) none of these

52. In 1 NF :
(a) all domains are simple   (b) in a simple domain, all elements are atomic
(c) both (a) and (b)   (d) none of these

53. 2 NF is always in :
(a) 1 NF   (b) BCNF
(c) MVD   (d) none of these

54. A relation R is said to be in 2 NF :
(a) if it is in 1 NF
(b) every non-prime key attribute of R is fully functionally dependent on each relation key of R
(c) if it is in BCNF
(d) both (a) and (b)

55. A relation R is said to be in 3 NF if the ;
(a) relation R is in 2 NF
(b) non-prime attributes are mutually independent
(c) functionally dependent on the prime key
(d) all of these

56. The idea of multi-valued dependency was introduced by :
(a) E.F. Codd   (b) R.F. Boyce
(c) R. Fagin   (d) none of these

57. The expansion of BCNF is :
(a) Boyd–Codd normal form   (b) Boyce–Ceromwell normal form
(c) Boyce–Codd normal form   (d) none of these

58. The 4 NF is concerned with dependencies b/w the elements of compounds keys composed of :
(a) one attribute   (b) two attribute
(c) three or more attribute   (d) none of these

59. When all the columns in a relation describe and depend upon the primary key, the relation is said to be in :
(a) 1 NF   (b) 2 NF
(c) 3 NF   (d) 4 NF

60. Which of the following is the activity of co-ordinating the actions of process that operate in parallel and access shared data?
(a) transaction management   (b) recovery management
(c) concurrency control   (d) none of these

61. Which of the following is the ability of a DBMS to manage the various transactions that occur within the system?
(a) transaction management   (b) recovery management
(c) concurrency control   (d) none of these

62. Which of following is transaction property?
(a) isolation   (b) durability
(c) atomiticity   (d) all of these

63. Which of the following ensures the consistency of the transactions?
    (a) application programmer   (b) concurrency control
    (c) recovery management   (d) transaction management

64. Which of the following ensures the durability of a transaction?
    (a) application programmer   (b) concurrency control
    (c) recovery management   (d) transaction management

65. In a shrinking phase, a transaction :
    (a) release all tasks   (b) cannot obtain any new lock
    (c) both (a) and (b)   (d) none of these

66. Which of the following ensures the atomicity of a transaction?
    (a) application programmer   (b) concurrency control
    (c) recovery management   (d) transaction management

67. Which of the following ensures the isolation of a transaction?
    (a) application programmer   (b) concurrency control
    (c) recovery management   (d) transaction management

68. Which of the following is a transaction state?
    (a) active   (b) commit
    (c) aborted   (d) all of these

69. The concurrency control has the following problem ;
    (a) lost updates   (b) dirty read
    (c) unrepeatable read   (d) all of these

70. Which of the following is a not a transaction management SQL command?
    (a) commit   (b) select
    (c) savepoint   (d) rollback

71. Which of the following is a statement after which you cannot issue a commit command?
    (a) insert   (b) select
    (c) update   (d) delete

72. Which of the following is validation-based concurrency control?
    (a) validation   (b) write
    (c) read   (d) all of these

73. Locking can take place at the following levels :
    (a) page level   (b) database level
    (c) row level   (d) all of these

74. A transaction can include following basic database access operation :
    (a) read-item (X)   (b) write-item (X)
    (c) both (a) and (b)   (d) none of these

75. Which of the following is not a deadlock handling strategy?
    (a) Timeout   (b) Deadlock annihilation
    (c) Deadlock prevention   (d) Deadlock detection

76. In a growing phase, a transaction as acquired all the required locks :
    (a) by locking data   (b) without unlocking data
    (c) with unlocking data   (d) none of these

77. Which of the following is an optimistic concurrency control method :
    (a) validation-based   (b) time-stamp ordering
    (c) lock-based   (d) none of these
78. The basic variations of timestamp-based methods of concurrency control are :
    (a) total timestamp ordering   (b) partial timestamp ordering
    (c) multiversion timestamp ordering (d) all of these
79. In optimistic methods, each transaction moves through the following phases :
    (a) read phase   (b) validation phase
    (c) write phase   (d) all of these
80. Which of the following is not a recovery technique :
    (a) shadow paging   (b) deferred update
    (c) write-ahead logging   (d) immediate update
81. Which of the following are copies of physical database files :
    (a) transaction log   (b) physical backup
    (c) logical backup   (d) none of these
82. Which of the following failure is caused by hardware failures :
    (a) operations   (b) design
    (c) physical   (d) none of these
83. Which of the following is most dangerous type of failures :
    (a) hardware   (b) network
    (c) media   (d) software
84. Hardware failure may include :
    (a) memory errors   (b) disk crashes
    (c) disk full error   (d) all of these
85. Software failure may include failure related to software such as :
    (a) operating system   (b) DBMS software
    (c) application program   (d) all of these
86. Which of the following is a facility provided by the DBMS to assist the recovery process :
    (a) recovery manager   (b) lagging facilities
    (c) backup mechanism   (d) all of these
87. When using a transaction log based recovery scheme, it might improve performance as well as providing a recovery mechanism by :
    (a) writing the appropriate log to disk during the transaction's execution
    (b) writing the log record to disk when each transaction commits
    (c) never writing the log records to disk
    (d) waiting to write the log records until multiple transactions commit and write then as a batch
88. To cope with media (or disk) failures, it is necessary :
    (a) to keep a redundant copy of the database
    (b) to never abort a transaction
    (c) for the DBMS to only execute transaction in a single user environment
    (d) all of these
89. Shadow paging technique maintains :
    (a) two page table   (b) three page table
    (c) four page table   (d) five page table

90. The checkpoint technique is used to limit :
    (a) the volume of log information
    (b) amount of searching
    (c) subsequent processing that is needed to carryout the transaction log file
    (d) all of these

91. Which of the following recovery techniques does not need logs :
    (a) shadow paging   (b) immediate update
    (c) deferred update   (d) none of these

92. The database backup is stored in a secure place, usually :
    (a) in a different building
    (b) protected against danger such as fire, theft, flood
    (c) other potential clamities
    (d) all of these

93. Loss of availability means that the :
    (a) data cannot be accessed by the users
    (b) system cannot be accessed by the users
    (c) both data and system cannot be used by users
    (d) none of these

94. Which of the following is the permission to access a named object in a prescribed manner :
    (a) role   (b) privilege
    (c) permission   (d) all of these

95. Loss of data integrity means that the :
    (a) data and system cannot be accessed by the users
    (b) invalid and corrupted data has been generated
    (c) loss of protecting or mountaining secrecy over critical data of the organization
    (d) loss of protecting data from individuals

96. Which of the following is not a part of the database security :
    (a) data   (b) hardware and software
    (c) people   (d) external hackers

97. Discretionary access control (also called security scheme) is based on the concept of :
    (a) access rights   (b) system-wide policies
    (c) both (a) and (b)   (d) none of these

98. Loss of confidentiality means that the :
    (a) data and system cannot be accessed by the uses
    (b) invalid and corrupted data has been generated
    (c) loss of protecting or maintaining secrecy over critical data of the organization
    (d) loss of protecting data from individuals

99. Loss of privacy means that the :
    (a) data and system cannot be accessed by the users
    (b) invalid and corrupted data has been generated
    (c) loss of protecting and maintaining secrecy over critical data of the organization
    (d) loss of protecting data from individuals

100. Legal and ethical issue one related to the :
    (a) right to access of an individual user or user groups to access certain information

(b) enforcement of various security functions at system levels, for example at physical hardware level, at the DBMS level or at the operating system level

(c) enforcement of the security policy of the organization with respect to permitting access to various classification of data

(d) none of these

101. System related issue one related to the :
   (a) rights to access of an individual user or group of users to access certain information
   (b) enforcement of various security functions at system level, for example at physical hardware level, at the DBMS level or at the operating system level
   (c) enforcement of the security policy of the organization with respect to permitting access to various classification of data
   (d) none of these

102. Which of the following is a database privilege :
   (a) the right to create a table or relation
   (b) the right to select rows from another user's table
   (c) the right to create a session
   (d) all of these

103. ORDBMS can handle :
   (a) complex objects   (b) user defined types
   (c) abstract data type   (d) all of these

104. Object-relational DBMS (ORDBMS) is also called :
   (a) enhanced relational DBMS   (b) general relational DBMS
   (c) object oriented DBMS   (d) all of these

105. Example of complex objects are :
   (a) complex non-conventional data in engineering designs
   (b) complex non-conventional data in the biological genome information
   (c) complex non-conventional data in architectural drawing
   (d) all of these

106. An ORDBMS product developed by ORACLE is known as :
   (a) universal database   (b) postgres
   (c) informix   (d) None of these

107. A distributed database system allows application to access data from :
   (a) local database   (b) remote database
   (c) both local and remote database   (d) none of these

108. In homogeneous DDBS :
   (a) there are several sites, each running their own application on the same DBMS software
   (b) all sites have identical DBMS software
   (c) all users (or client) use identical software
   (d) all of these

109. In heterogeneous DDBS :
   (a) different sites run under the control of different DBMSs, essentially autonomously
   (b) different sites are connected somehow to enable access to data from multiple sites
   (c) different sites may use different schemas and different DBMS
   (d) all of these

110. The main component of the client/server architecture :
    (a) communication networks   (b) server
    (c) application software   (d) all of these
111. Which of the following is not benefit of client/server architecture :
    (a) reduction in operating cost   (b) adaptability
    (c) plateform independence   (d) none of these
112. Which of the following are the component of DDBS :
    (a) communication network   (b) server
    (c) client   (d) all of these
113. Which of the computing architecture is used by DDBS :
    (a) client/server computing   (b) mainframe computing
    (d) personal computing   (d) none of these
114. In collaborating server architecture :
    (a) there are several database servers
    (b) each server is capable of running transactions against local data
    (c) transactions are executed spanning multiple servers
    (d) all of these
115. Data fragmentation is a :
    (a) technique of breaking up the database into logical units, which may be assigned for storage at the various sites
    (b) process of deciding about locating (or placing) data to server sites
    (c) technique that permit storage of certain data in move than one sites
    (d) none of these
116. A horizontal fragmentation is produced by specifying :
    (a) predicate operation of relational algebra
    (b) projection operation of relational algebra
    (c) selection and projection operation of relational algebra
    (d) none of these
117. A vertical fragmentation is produced by specifying a :
    (a) predicate operation of relational algebra
    (b) projection operation of relational algebra
    (c) selection and projection operational relational algebra
    (d) none of these
118. In distributed query processing, semijoin operation is used to :
    (a) reduce the size of a relation that needs to be transmitted
    (b) reduced the communication cost
    (c) both (a) and (b)
    (d) none of these
119. In DDBS the lock manager function is :
    (a) distributed over several sites   (b) centralised at one site
    (c) no lock manager is used   (d) none of these
120. In distributed system, the detection of a deadlock requires the generation of :
    (a) local wait for graph   (b) global wait for graph
    (c) both (a) and (b)   (d) none of these

121. In distributed database system, the deadlock prevention method by aborting the transaction can be used such as :
(a) timestamping   (b) wait-die method
(c) wound-wait method   (d) all of these
122. Which of the following is the function of a distributed DBMS :
(a) distributed data recovery   (b) distributed query processing
(c) replicated data management   (d) all of these

ANSWERS

1. (a)	2. (a)	3. (d)	4. (c)	5. (d)	6. (d)
7. (b)	8. (d)	9. (d)	10 (d)	11 (d)	12 (d)
13. (d)	14. (d)	15. (d)	16. (a)	17. (b)	18. (a)
19. (a)	20. (d)	21. (d)	22. (d)	23. (a)	24. (d)
25. (b)	26. (b)	27. (d)	28. (c)	29. (c)	30. (a)
31. (c)	32. (d)	33. (d)	34. (a)	35. (d)	36. (c)
37. (c)	38. (b)	39. (d)	40. (d)	41. (a)	42. (d)
43. (b)	44. (c)	45. (d)	46. (a)	47. (c)	48. (d)
49. (a)	50. (d)	51. (b)	52. (c)	53. (a)	54. (d)
55. (d)	56. (c)	57. (c)	58. (c)	59. (b)	60. (a)
61. (b)	62. (d)	63. (b)	64. (c)	65. (c)	66. (c)
67. (b)	68. (d)	69. (d)	70. (c)	71. (b)	72. (d)
73. (d)	74. (c)	75. (b)	76. (b)	77. (a)	78. (d)
79. (d)	80. (c)	81. (b)	82. (b, c)	83. (c)	84. (d)
85. (d)	86. (d)	87. (a)	88. (a)	89. (a)	90. (a)
91. (d)	92. (d)	93. (a)	94. (b)	95. (b)	96. (c)
97. (a)	98. (c)	99. (d)	100. (a)	101. (b)	102. (d)
103. (d)	104. (a)	105. (d)	106. (d)	107. (c)	108. (d)
109. (d)	110. (d)	111. (d)	112. (d)	113. (a)	114. (d)
115. (a)	116. (a)	117. (b)	118. (c)	119. (a)	120. (c)
121. (d)	122. (d)				

STATE TRUE/FALSE
1. Data is also called metadata.
2. Data is a piece of fact
3. Data are distinct pieces of information.
4. In DBMS, data files are the files that store the database information.
5. The external schema defines how and where the data are organised in a physical data storage.
6. A collection of data designed for use by different users is called a database.
7. In a database, data integrity can be maintained.
8. The data in a database cannot be shared.

9. The DBMS provides support languages used for the definition and manipulation of the data in the database.

10. Data catalog and data dictionary are the same.

11. The data catalog is required to get information about the structure of the database.

12. A database cannot avoid data inconsistency.

13. Using database redundency can be reduced.

14. Security restrictions cannot be applied in a database system.

15. Data and metadata are the same.

16. Metadata is also known as data about data

17. A system catalog is a repository of information describing the data in the database.

18. The information stored in the catalog is called metadata.

19. DBMSs manage concurrent databases access and prevents from the problem of loss of information of loss of integrity.

20. View definition language is used to specify user views (external schema) and their mappings to the conceptual schema.   .

21. Data storage definition language is used to specify the conceptual schema in the database.

22. Structured query language (SQL) and query by example (QBE) are the examples of fourth-generation language.

23. A transaction cannot update a record, delete a record, modify a set of records and so no.

ANSWER

1. True 2. True 3. True 4. True 5. False 6. True 7. True 8. False 9. True
10. True 11. True 12. False 13. True 14. False 15. False 16. True 17. True
18. True 19. True. 20. True 21. False 22. True 23. False.

FILL IN THE BLANKS

1. .... is the most critical resource of an organisation.

2. Data is a raw .... whereas information is ....

3. A .... is a software that provides services for accessing a database.

4. Two important language in the database system are (a) .... and (b) ....

5. To access information from a database, one needs a ....

6. DBMS stands for ....

7. SQL stand for ....

8. 4GL stands for ....

9. The three data structures for data warehouse applications are (a)...... (b)..... and (c)....

10. DDL stands for ....

11. DML stands for ....

12. Derived data are stored in ....

13. The four components of data dictionary are (a) .... (b) .... (c) .... and (d) ....

14. The four types of keys used are (a) .... (b) .... (c) .... and (d) ....

15. The two types of data dictionaries are (a) .... and (b) ....

16. CODASYL stands for ....

17. LPTF stands for ....

18. DBTG stands for ....

19. In mid-1960s, the first general porpose DBMS was designed by Charles Bachman at General Electric, USA was called ....

20. First recipient of the computer science equivalent of the Nobel prize, called *Association of Computing Machinery (ACM) Turing Award,* for work in the database area, in 1973 was ....

21. When the DBMS does a commit, the changes made by the transaction are made ....

Answers

1. Data, 2. Fact, processed/organized/summarized data, 3. DBMS, 4. (a) Data description language (DDL), (b) data manipulation language (DML), 5. DBMS, 6. Data base Management System, 7. Structured Query Language, 8. Fourth Generation Language, 9. (a) Operational Data, (b) Reconciled Data, (c) Derived Data, 10. Data Definition Language, 11. Data Manipulation Language, 12. Each of the data mart (a selected, lmited, and summarized data ware house), 13. (a) Entities, (b) Attributes, (c) Relationships, (d) Key, 14. (a) Primary key, (b) Secondary key, (c) Super key, (d) Concatenated key, 15. (a) Active data dictionary, (b) passive data dictionary, 16. Conference of Data System Language, 17. List Processing Task Force, 18. Data Base Task Force, 19. Integrated Data Store (IDS), 20. Bachman, 21. Permanent.

STATE TRUE/FALSE

1. In a database management system, data files are the files that store the database information.

2. The external schema defines how and where data are organised in physical data storage.

3. In a network database terminology, a relationship is a set.

4. A feature of relational database is that a single database can be spread across several tables.

5. An SQL of is a fourth generation langeuage.

6. An object-oriented DBMS is suited for multimedia applications as well as data with complex relationship.

7. An OODBMS allows for fully integrated databases that hold data, text, voice, pictures and video.

8. The hierarchical model assumes that a tree structure is the most frequently occurring relatiouship.

9. The hierarchical database model is the oldest data model.

10. The data in a database cannot be shared.

11. The primary difference between the different data models lies in the methods of expressing relationships and constraints among the data elements.

12. In a database, the data are stored in such a fashion that they are independent of the programs of users using the data.

13. The plan (or formulation of scheme) of the database is known as schema.

14. The physical schema is concerned with exploiting the data structures offered by a DBMS in order to make the scheme understand to the computer.

15. The logical schema, deals with the manner in which the conceptual database shall get represented in the computer as a stored database.

16. Subschemas act as a unit for enforcing controlled assess to the database.

17. The process of transforming requests and results between three levels are called mapping.

18.   The conceptual/internal mapping defines the correspondence between the conceptual view and the stored database.

19.   The external/conceptual mapping defines the correspondence between a particular external view and the conceptual view.

20.   A data model is an abstraction process that concentrates essential and inherent aspects of the organisation's applications while ignores superfluous or accidental details.

21.   Object-oriented data model is a logical data model that captures the semantics of objects supported in object-oriened programming.

22.   Centralised database system is physically confined to a single location.

23.   Parallel database system architecture consists of one central processing unit (CPU) and data storage disks in parallel.

24.   Distributed database systems are similar to client/server architecture.

FILL IN THE BLANKS

1.   Relational data model stores data in the form of a ....

2.   The .... defines various views of the database.

3.   The .... model defines the stored data structures in terms of the database model used.

4.   The object-oriented data model maintains relationships through ....

5.   The .... data model represents an entity as a class.

6.   .... represent a correspondence between the various data elements.

7.   To access information from a database one needs a ....

8.   A .... is a sequence of database operations that represent a logical unit of work and that access a database and transforms it from one state to another.

9.   The database applications are usually portioned into a .... architecture or a .... architecture ....

10.   A subschema is a .... of the schema.

11.   Immunity of the conceptual (or external) schemas to changes in the internal schema is referred to as ....

12.   Immunity of the external schemas (or application programs) to changes in the conceptual schema is referred to as ....

13.   The process of transforming requests and results between three levels are called ....

14.   The conceptual/internal mapping defines the correspondence between the .... view and the ....

15.   The external/conceptual mapping defines the correspondence between a particular .... view and the .... view.

16.   The hierarchical data model is represented by an .... tree.

17.   Information Management System (IMS) was developed jointly by .... and ....

18.   Network data model was formalized by .... in the late ....

19.   The three basic components of network model are (a) .... (b) .... and (c) ....

20.   The relational data model was first introduced by ....

21.   Client/server architecture of database system has two logical components namely .... and ....

ANSWERS

TRUE AND FALSE :
1. True   2. False   3. True   4. True   5. True   6. True   7. True   8. True 9. True   10. False   11. True   12. True   13. True   14. True   15. True   16. False   17. True   18. True   19. True   20. True   21. True   22. True   23. False   24. True.

FILL IN THE BLANKS :
1. Table 2. External Level 3. Physical 4. Entity and class 5. Object-oriented 6. E-R diagram 7. DBMS 10. Inherits 11. Physical data independecne 12. Logical data independence 14. Conceptual, stored database 15. External, conceptual 16. Upside-down 17. IBM, North American Aviation 18. DBTG/CODASYL, 1960s 19. (a) record type, (b) data items (or fields), (c) linds 20. E.F. Godd 21. Client, server.

STATE TRUE/FALSE

1. In 1980 Dr. E.F. Codd was working with Oracle Corporation.
2. DB2, System *R* and ORACLE are examples of relational DBMS.
3. In the RDBMS terminology, a table is called a relation.
4. The relational model is based on the core concept of relation.
5. Cardinality of a table means the number of columns in the table.
6. In the RDBMS terminology, an attributes means a column or a field.
7. A domain is a set of atomic values.
8. Data values are assumed to be atomic, which means that they have no internal structure as far as the model is concerned.
9. A table cannot have more than one attribute which can uniquely identify the rows.
10. A candidate key is an attribute that can uniquely identify a row in a table.
11. A table can have only one alternate key.
12. A table can have only one candidate key.
13. The foreign key and the primary key should be defined on the same underlying domain.
14. A relation always has a unique identifier.
15. Primary key performs the unique identification function in a relational database model.
16. In a reality, NULL is not a value, but rather the absence of a value.
17. Relational database is a finite collection of relations and a relation in terms of domains, attributes, and tuples.
18. Atomic means that each value in the domain is indivisible to the relational model.
19. Superkey is an attribute, or set of attributes, that uniquely identifies a tuple within a relation.
20. Codd defined well-formed formulas (WFFs).

FILL IN THE BLANKS

1. The relational model is based on the core concept of ....
2. The foundation of relational database technology was laid by ....
3. Dr. E.F Codd, in paper titled .... laid the basic principles of the RDBMS.
4. The first attempt at a large implementation of Codd's relational model was ....
5. In the RDBMS terminology, a record is called a ....

6.   Degree of a table means the number of .... in a table.

7.   A domain is a set of .... values.

8.   The smallest unit of data in the relational model is the individual ....

9.   .... is set of all possible data values.

10. The number of attributes in a relation is called the .... of the relation.

11. The number of tuples or rows in a relation is called the .... of the table

12. A table can have only one .... key.

13. All the values that appear in a column of the table must be taken from the same ....

14. Tuple relational calculus was originally proposed by .... in ....

ANSWERS

STATE TRUE/FALSE :

1. False   2. True   3. True   4. True   5. False   6. True   7. True   8. True   9. False
10. False   11. False   12. False   13. True.   14. True   15. True   16. True   17. True
18. True   19. True   20. True

FILL IN THE BLANKS :

1. Relation and the set theory,   2. Dr. E.F. Codd,   3. A Relational model of Data for Large Shared Data Banks,   4. System R,   5. Tuple   6. Number of columns,   7. Legal or atomic values,   8. Field,   9. Field,   10. Degree,   11. Cardinality,   12. Primary key,   13. Relation, 14. Dr. Codd, 1972.

STATE TRUE/FALSE

1.   Dr. Edgar F. Codd proposed a set of rules that were intended to define the important characteristics and capabilities of any relational system.

2.   Codd's Logical Data Independence rule states that user operations and application programs should be independent of any changes in the logical structure of base tables provided they involve no loss information.

3.   The entire field of RDBMS has its origin in Dr. E.F. Codd's paper.

4.   ISBL has no aggregate operators for example, average, mean and so on.

5.   ISBL has no facilities for insertion, deletion or modification of tupels.

6.   QUEL is a tuple relational calculus language of a relational database system INGRESS (Interactive Graphics and Retrieval System)

7.   QUEL supports relational algebraic operations such as intersection, minus or union.

8.   The first commercial RDBMS was IBM's DB2.

9.   The first commercial RDBMS was IBM's INGRES.

10. SEQUEL and SQL are the same

11. SQL is a relational query language.

12. SQL is essentially not a free-format language.

13. SQL statements can be invoked either interactively in a terminal session but cannot be embedded in application programs.

14. In SQL data type of every data object is required to be declared by the programmer while using programming languages.

15. HAVING clause is equivalent of WHERE clause is used to specify the search criteria or search condition when GROUP BY clause is specified.
16. HAVING clause is used to eliminate groups just as WHERE is used to eliminate rows.
17. If HAVEING is specified, ORDER BY clause must also be specified.
18. ALTER TABLE command enables us to delete columns from a table.
19. The SQL data definition language provides command for defining relation schemas, deleting relations and modifying relation schemas.
20. In SQL, it is not possible to create local or global temporary tables within a transaction.
21. All tasks related to relational data management cannot be done using SQL alone.
22. DCL commands let users insert data into the database, modify and delete the data in the database.
23. DML consists of commands that control the user access to the database objects.
24. If nothing is specified, the result set is stored in descending order, which is the default.
25. '*' is used to get all the columns of a particular table.
26. The CREATE TABLE statement creates new base table.
27. A based table is not an autonomous named table.
28. DDL is used to create, alter and delete database objects.
29. SQL data administration statement (DAS) allows the user to perform audits and analysis on operations within the database.
30. COMMIT statement ends the transaction successfully, making the database changes permanent.
31. Data administration Commands allow the users to perform audits and analysis on operations within the database.
32. Transaction control statements manage all the changes made by the DML statement.
33.. DQL enables the users to query one or more table to get the information they want.
34. In embedded SQL, SQL statement are merged with the host programing language.
35. The DISTINCT keyword is illegal for MAX and MIN.
36. Application written in SQL can be easily ported across systems.
37. Query-By-Example (QBE) is a two-dimensional domain calculus language.
38. QBE was originally developed by M.M. Zloof at IBM's T.J. Waston Reserach Centre.
39. QBE represents a visual approach for accessing information in a database through the use of query templates.
40. The QBE make-table action query is an action query as it performs an action on existing table or tables to create a new table.
41. QBE differs from SQL in that the user does not have to specify a structured query explicitly.
42. In QBE, user does not have to remember the names of the attributes or relation, because they are displayed as part of the templates.
43. The delete action query of QBE deletes one or more than one records from a table or more than one table.

FILL IN THE BLANKS

1. Information system based language (ISBL) is a pure relational algebra based query language, was developed in .... in UK in the year ....
2. ISBL was first used in an experimental interactive database management system called ....
3. In ISBL, to print the value of an expression, the command is preceded by .

4.   .... is a standard command set used to communicate with the RDBMS.

5.   To query data from tables in a database, we use the .... statement.

6.   The expanded form of QUEL is ....

7.   QUEL is a tuple relational calculus language of a relational database system called ....

8.   QUEL is based on ....

9.   INGRES in the relational database management system developed at ....

10.   .... is the data defintion and data manipulation language for INGRES.

11.   The data definition statement used in QUEL (a) .... (b) .... (c) .... (d) .... and (e).

12.   The basic data retrieval statement in QUEL is ....

13.   SEQUEL was the first prototype query language of ....

14.   SEQUEL was implemented in the IBM prototype called ....

15.   SQL was first implemented on a relational database called ....

16.   DROP operation of SQL is used for .... tables from the schema.

17.   The SQL data definition language provides commands for (a) ....(b)...........and (c).....

18.   .... is an example of data definition language command or statement.

19.   ....is an example of data manipulation language command or statement

20.   The .... clause sorts or orders the results based on the data in one or more columns in the ascending or descending order.

21.   The ....clause specifies a summary query.

22.   ....is an example of data control language command or statement.

23.   The.............clause specifies the table or tables from where the data has to be retrieved.

24.   The...........clause directs SQL to include only certain rows of data in the result set.

25.   ....is an example of data admministration system command or statement

26.   ....is an example of transaction control statement.

27.   SQL data administration statement (DAS) allows the user to perform (a).......... and (b)........ on operations within the database.

28.   The five aggregate functions provided by SQL are (a) ....(b)...........(c)................(d)........... and (e)............

29.   Portability or embedded SQL is........

30.   Query-BY-Example (QBE) is a two-dimensional .... language.

31.   QBE was originally developed by.... at IBM's T.J. Watson Research Centre.

32.   The QBE............. creates a new table from all or part of the data in one or more tables.

33.   QBE's .... can be used to update or modify the values of one or more records in one or more than one table in a database.

34.   In QBE, the query is formulated by filling in .... or relations that are displayed on the MS Access screen.

ANSWERS

STATE TRUE/FALSE :

1. True 2. True 3. True 4. True 5. Ture 6. True 7. True 8. False 9. True
10. True 11. True 12. False 13. False 14. True 15. True. 16. True 17. False
18. True 19. True 20. False 21. False 22. False 23. False 24. False 25. True

26. True   27. True   28. True   29. True   30. True   31. True   32. True   33. True
34. True   35. False   36. True   37. True   38. True   39. True   40. True   41. True
42. True   43. True

FILL IN THE BLANKS :
1. IBM's Peterlee Centre, 1973, 2. Peterlee Relational Test Vehicle (PRTV), 3. LIST, 4. SQL, 5. SELECT, 6. Query Language, 7. INGRESS, 8. Tuple relational calculus language of relatinal database system INGRESS, 9. IBM, 10. SQL, 11. (a) CREATE, (b) RETREIVE, (c) DELETE, (d) SORT, (e) PRINT, 12. RETREIVE, 13. IBM, 14. System R, 15. SystemR, 16. Deleting, 17. (a) defining relation schemas, (b) deleting relation, (c) modifying relaiton schemas, 18. CREATE ALTER DROP, 19. INSERT, DELETE UPDAT, 20. ORDER BY, 21. GROUP BY, 22. GRANT, REVOKE, 23. FROM, 24. WHERE, 25. START AUDIT, STOP AUDIT, 26. COMMIT, ROLLBACK, 27. (a) audits, (b) analysis, 28. (a) AVG, (b) SUM, (c) MIN, (d) MAX, (e) , 29. Very high, 30. Domain calculus, 31. M.M. Zloo, 32. Make-table, 33. U command.

STATE TRUE/FALSE

1. *E-R* model was first introduced by Dr. E.F. Codd.
2. E-R modelling is a high-level conceptual data model developed to facilitate database design.
3. *E-R* model is dependent on a particular database managenment system (DBMS) and hardware platform.
4. A binary relationship exists when an association is maintained within a single entity.
5. A weak entity type is independent on the existence of another entity.
6. An entity type is a group of objects with the same properties, which are identified by the enterprise as having an independent existence.
7. An entity occurrence is also called entity instance.
8. An entity instance is a uniquely identifiable object of an entity type.
9. A relationship is an association among two or more entities that is of interest to the enterprise.
10. The partipation is optional if an entity's existence requires the existence of an associated entity in a particular relationship.
11. An entity type does not have an independent existence.
12. An attribute is viewed as the atomic real world item.
13. Domains can be composed of more than one domain.
14. The degree of a relationship is the number of entities associated or participants in the relationship.
15. The connectivity of a relationship describes a constraint on the mapping of the associated entity occurrences in the relationship.
16. In case of mandatory existence, the occurrence of that entity need not exists.
17. An attribute is a property of an entity or a relatioship type.
18. In *E-R* diagram, if the attrubute is simple or single-valued then they are connected using double lines.
19. In *E-R* diagram, if the attribute is derived when they are connected using double lines.
20. An entity type that is not existence-dependent on some other entity type is called a strong entity type.

21. Weak entities are also referred to as child, dependent or subordinate entities.
22. An entity type can be an object with a physical existence but cannot be an object with a conceptual existence.
23. Simple attributes can be further divided.
24. In an *E-R* diagram, the entity name is written in uppercase whereas the attribute name is written in lowercase letters.

FILL IN THE BLANKS

1. *E-R* model was introduced by .... in ....
2. An entity is an .... or .... in the real world.
3. A relationship is an .... among two or more .... that is of interest to the enterprise.
4. A particular occurrence of a relationship is called a ....
5. The database model uses the (a) .... (b) .... (c) .... to construct representation of the real world system.
6. The relationship is joined by .... to the entities that participate in the relationship.
7. An association among three entities is called ....
8. A relationship between the instances of a single entity type is called ....
9. The association between the two entities is called ....
10. The actual count of elements associated with the connectivity is called .... of the relationship connectivity.
11. An attribute is a property of .... or a .... type.
12. The components or an entity or the qualifiers that describe it are called .... of the entity.
13. In *E-R* diagram, the .... are represented by a rectangular box with the name of the entity in the box.
14. The major components of an E-R diagram are (a) .... (b) .... (c) .... (d) ....
15. The *E-R* diagram captures the (a) .... and (b) ....
16. .... entities are also referred to as parent, owner or dominant entities.
17. A .... is an attribute composed of a single component with an independent existence.
18. In *E-R* diagram, ... are under lined.
19. Each uniquely identifiable instance of an entity type is also reffered to as an .... or ....
20. A .... relationship exists when two entities are associated.
21. In an *E-R* diagram, if the attribute is .... its component attributes are shown is ellipses emanating from the composite attribute.

ANSWERS

STATE TRUE/FALSE :
1. False 2. True 3. False 4. False 5. False 6. True 7. True 8. True
9. True 10. True 11. False 12. True 13. True 14. True 15. Ture 16. False
17. True 18. True 19. False 20. True 21. True 22. False 23. False 24. False
FILL IN THE BLANKS :
1. P.P Chen, 2. Object, thing, 3. Association, entities, 4. Connectivity, 5. (a) entities, (b) Attributes, (c) relationships, 6. Lines, 7. Ternary relationship, 8. Recursive relationship,

9. Binary relationship,　10. Cardinality,　11. Entity, relationship,　12. Attribute or data items, 13. Entity set,　14. (a) entity sets, (b) relationship sets, (c) attributes, (d) mapping caradinalities, 15. Data (b) data organisation,　16. Strong entity type,　17. Simple attribute,　18. Primary keys,　19. Entity occurrence, entity instance,　20. Binary,　21. Composite,

STATE TRUE/FALSE

1. Subclasses are the sub-grouping of occurrences of entities in an entity type that shares common attributes or relationships distinct from other sub-groupings.
2. In case of supertype, objects in one set are grouped or subdivided into one or more classes in many systems.
3. Superclass is a generic entity type that has a relationship with one or more subtypes.
4. Each member of the subclass is also a member of the superclass.
5. .The relationship between a superclass and a subclasses is a one-to-many (1 : N) relationship.
6. The U-shaped symbols in ERR model indicates that the supertype is a subset of the subtype.
7. Attribute inheritance is the property by which supertype entities inherit values of all attributes of the subtype.
8. Specialisation is the process of identifying subsets of an entity set of the superclass or supertype that share some distinguishing characteristic.
9. Specialisation minimizes the differences between members of an entity by identifying the distinguishing and unique characteristics of each member. .
10. Generalisation is the process of identifying some common characteristies of a collection of entity sets and creating a new entity set that contains entities processing these common characteristics.
11. Generalisation maximizes the differences between the entities by identifying the common features.
12. Total participation is also called an optional participation.
13. A total participation specifies that every member (or entity) in the supertype (or superclass) must participate as a member of some subclass in the specialisation/generalization.
14. The participation constraint can be total or partial.
15. A partial participation constraint specifies that a member of a supertype need not belong to any of its subclasses of a specialisation/generalisation.
16. A non-joint constraint is also called an overlapping constraint.
17. A partial participation is also called a mandatory participation.
18. Disjoint constraint specifies the relationship between members of the subtypes and indicates whether it is possible for a member of a supertype to be a member of one, or more than one, subtype.
19. The disjoint constraint is only applied when it is a supertype.
20. A partial participation is represented using a single line between the supertype and the specialisation/generalisation circle.
21. A subtype is not an entity on its onw.
22. A subtype commot have its own subtypes.

FILL IN THE BLANKS

1. The relationship between a superclass and a subclasses is ....
2. The U-shaped symbols in EER model indicates that the .... is a .... of the ....

3. Attrubute inheritance is the property by which .... entities inherent values of all attributes of the ....

4. The *E-R* model that is supported with the additional semantic concepts is called the ....

5. Attribute inheritance avoids ....

ANSWERS

TRUE/FALSE :
1. True 2. True 3. True 4. True 5. False 6. False 7. False 8. True 9. True
10. True 11. True 12. False 13. True 14. True 15. True 16. True 17. False
18. True 19. False, 20. True 21. Ture 22. True 23. True 24. True.

STATE TRUE/FALSE

1. A functional dependency (FD) is a property of the information represented by the relation.
2. Functional dependency allows the database designer to express facts about the enterprise that the designer is modelling with the enterprise database.
3. A finctional dependency is a many-to-many relationship between two sets of attributes X and Y of a given table T.
4. The term full functional dependency (FFD) is used to indicate the maximum set of attributes in a determinant of a functional dependency (FD).
5. A functional dependency in the set is redundant if it can be derived from the other functional dependencies in the set.
6. A closure of a set (also called complete) of functional dependency defines all the FDs that can be derived from a given set of FDs.
7. A functional decomposition is the process of breaking down the functions of an organisation into progressively greater (finer and finer) levels of detail.
8. The word *loss* in lossless refers to the loss of attributes.
9. The dependencies are preserved because each dependency in F represents a constraint on the database.
10. If decomposition is not dependency-preserving some dependency is lost in the decomposition.

FILL IN THE BLANKS

1. A .... is a many-to-one relationship between two sets of .... of a given relation.
2. The left-hand side and the right-hand side of a functional dependency are called the (a) .... and the .... respectively.
3. The arrow notation '→' in FD is read as ....
4. The term full functional dependency (FFD) is used to indicate the .... set of attributes in a .... of a functional dependency (FD).
5. A functional dependency in the set is redundant if it can be derived from the other .... in the set.
6. A closure of a set (also called complete sets) of functional dependency defines all .... that can be derived from a given set of ....

7. A functional decomposition is the process of .... the functions of an organisation into progressively greater (finer and finer) levels of detail.

8. The lossless-join decomposition is a property of decomposition, which ensures that no .... are generated when a .... operation is applied to the relations in the decomposition.

9. The word *loss* in lossless refers to the ....

10. Armstrong's axionms and derived rules can be used to find .... FDs.

ANSWERS

TRUE AND FALSE :
1. True 2. True   3. False 4. False   5. True 6. True 7. True 8. False
9. True 10. True.

FILL IN THE BLANKS :
1. Functional dependency, attributes , 2. (a) determinant, (b) dependent,
3. Functionally determines, 4. Minimum, determinant, 5. Functional dependencies,
6. FDs, FDs, 7. Breaking down, 8. Spurious tuples, natural join, 9. Loss of information,
10. Non-redundant set and complete sets (or closure) of.

STATE TRUE/FALSE

1. Normalization is a process of decomposing a set of relations with anomalies to produce smaller and will-structured relations that contain minimum or no redundancy.

2. A relation is said to be in 1NF if the values in the domian of each attribute of the relation are non-atomic.

3. 1NF contains no redundant information.

4. 2NF is always in 1NF.

5. 2NF is the removal of the partial functional dependencies or redundant data.

6. When a relation R in 2NF with FDs $A \to B$ and $B \to CDEF$ (where A is the only candidate key), is decomposed into two relations R_1 (with $A \to B$) and R_2 (with $B \to CDEF$), the relations R_1 and R_2
    (a) are always a lossless decomposition of R.
    (b) usually have total combined storage space less than R.
    (c) have no delete anomalies.
    (d) will always be faster to execute a query then R.

7. When a relation R in 3NF with FDs $AB \to C$, the relations R_1 (with $AB \to null$, that is, *all key*) and R_2 (with $C \to R$), the relations R_1 and R_2.
    (a) are always a lossless decomposition of R.
    (b) are both dependicy preservation.
    (c) are both in BCNF.

8. When a relation R in BCNF with FDs $A \to BCD$ (where A is the primary key) is decomposed into two relations R_1 (with $A \to B$) and R_2 (with $A \to CD$), the resulting two relations R_1 and R_2.
    (a) are always dependency preserving.
    (b) usually have total combined storage space less than R.
    (c) have no delete anomalies.

9.   In 3NF, no non-prime attribute is functionally dependent on another non-prime attribute.

10.   In BCNF, a relation must only have candidate keys as determinants.

11.   Lossless-join dependency is a property of decomposition, which ensures that no spurious tuples are generated when relations are returned through a natural join operation.

12.   Multi-valued dependencies are the result of 1NF, which prohibited an attribute from having a set of values.

13.   5NF does not require semanticlly related multiple relationships.

14.   Normalization is a formal process of developing data structure in a manner that eliminates redundancy and promotes integrity.

15.   5NF is also called projection-join normal form (PJNF)

FILL IN THE BLANKS

1.   Normalization is a process of .... a set of relations with anomalies to produce smaller well-structured relations that contain minimum or no ....

2.   .... is the formal process for deciding which attributes should be grouped together.

3.   In the .... process we analyse and decompose the complex relations and transform into smaller, simpler, and well-structured relations.

4.   .... first developed the process of normalization.

5.   A relation is said to be in 1NF if the values in the domain of each attribute of the relation are ....

6.   A relation R is said to be in 2NF if it is in .... and every non-prime key attributes of R is .... on each relation key of R.

7.   2NF can be violated only when a key is a .... key or one that consists of more than one ....

8.   When the multi-valued attributes or repeating groups in a relation are removed then that relation is said to be in.............. .

9.   In 3NF, no non-prime attribute is functionally dependent on ....

10.   Relation R is said to be in BCNF if for every nontrivial FD: .... between attributes X and Y holds in R.

11.   A relations is said to be in the .... when transitive dependencies are removed.

12.   A relation is in BCNF if and only if every determinant is a ....

13.   Any relation in BCNF is also in .... and consequently in ....

14.   The difference between 3NF and BCNF is that for a functional dependency $A \to B$, 3NF allows this dependency in a relation if B is a .... key attribute and A is not a .... key. Whereas, BCNF insists that for this dependency to remain in a relation, A must be a .... key.

15.   4NF is violated when a relation has undesirable ....

16.   A relation is said to be in 5NF if every join dependency is a .... of its relation keys.

ANSWERS

TRUE AND FALSE :
1. True   2. False   3. False   4. True   5. True   6. True   7. True   8. True   9. False
10. True   11. True   12. False   13. True   14. True   15. True.
FILL IN THE BLANKS :
1. Decomposing redundancy,   2. Normalization,   3. Normalization,   4. E. F. Codd,

5. Atomic, 6. 1NF, fully functionally dependent, 7. Composite attribute, 8. 1NF,
9. Primary (or relational) key, 10. X Y, 11. 3NF, 12. Candidate key, 13. 3NF, 2NF,
14. Primary, candidate, candidate, 15. MVDs, 16. Consequence.

FILL IN THE BLANKS

1. A query processor transforms a .... query into an .... that performs the required retrievals and manipulations in the database.

2. Execution plan is a series of .... steps.

3. In syntax-checking phase of query processing the system .... the query and checks that it obeys the .... rules.

4. .... is the process, of transforming a query written in SQL (or any high-level language) into a correct and efficient execution strategy expressed in a low-level language.

5. During the query transformation process, the .... checks the syntax and verifies if the relations and the attributes used in the query are defined in the database.

6. Query transformation is performed by transforming the query into .... that are more efficient to execute.

7. The four main phases of query processing are (a) .... (b) .... (c) .... and (d) ....

8. The two types of query optimization techniques are (a) .... and (b) ....

9. In .... the query is parsed, validated and optimised once.

10. The objective of .... is to transform the high-level query into a relational algebra query and to check whether that query is syntactically and semantically correct.

11. The five stages of query decomposition are (a) .... (b) .... (c) .... (d) .... (e) ....

12. In the .... stage, the query is lexically and syntactically analysed using parsers to find out any syntax error.

13. In .... stage, the query is converted into normalised form that can be more easily maniputated

14. In .... stage, incorrectly formulated and contradictory queries are rejected.

15. .... uses the transformation rules to convert one relational algebraic expression into an equivalent form that is more efficient.

16. The main cost components of query optimization are (a) .... and (b) ....

17. A query tree is also called a .... tree.

18. Usually, heuristic rules are used in the form of .... or .... data structure.

19. The heuristic optimization algorithm utilises some of the transformation rules to transform an .... query tree into an .... and .... query tree.

20. The emphasis of cost minimization depends on the .... and .... of database applications.

21. The process of query evaluation in which several relational operations are combined into a pipeline of operations is called ....

22. If the result of the intermediate processes in a query are created and then are used for evaluation of the next-level operations, this kind of query execution is called ....

ANSWERS

FILL IN THE BLANKS :

1. High-level, execution plan, 2. Query complication, 3. Parses, syntax, 4. Query processing, 5. Syntax analyzer uses the grammar of SQL as input and the parser protion of the query processor, 6. Algebraic expression (relational algebra query), 7. (a) Syntax analyser, (b) Query decomposer, (c) Query Optimizer (d) Query code generator, 8. (a) Heuristic query optimisation, (b) Systematic estimation. 9. Query optimizer, 10. Query decomposer, 11. (a) Query analysis, (b) query normalization, (c) Semantic analysis, (d) Query simplifier, (e) Query restructuring, 12. Query analysis, 13. query normalization, 14. Semantic analyser, 15. Query restructuring, 16. (a) number of I/Os, (b) CPU times, 17. Relational algebra, 18. query, query graph, 19. Initial (canonical), optimised, efficiently executable, 20. Size, type, 21. On-the-fly processing, 22. Materialization.

STATE TRUE/FALSE

1. The transaction consists of all the operations executed between the beginning and end of the transaction.

2. A transaction is a program unit, which can either be embedded within an application program or can be specified interactively via a high-level query language such as SQL.

3. The changes made to the database by an aborted transaction should be revered or undone.

4. A transaction that is either committed or aborted is said to be terminated.

5. Atomic transaction is transactions in which either all actions associated with the transaction are executed to completion, or none are performed.

6. The effects of a successfully completed transaction are permanently recorded in the database and must not be lost because of a subsequent failure.

7. Level 0 transactions are recoverable.

8. Level 1 transaction is the minimum consistency requirement that allows a transaction to be recovered in the event of system failure.

9. Log is a record of all transactions and the corresponding changes to the database.

10. Level 2 transaction consistency isolates from the updates of other transactions.

11. The DBMS automatically update the transaction log while executing transactions that modify the database.

12. A committed transaction that has performed updates transforms the database into a new consistent state.

13. The objective of concurrency control is to schedule or arrange the transactions in such a way as to avoid any interference.

14. Incorrect analysis problem is also known as dirty read or unrepeatable read.

15. A consistent database state in one in which all data integrity constraints are satisfied.

16. The serial execution always leaves the database in a consistent state although different results could be produced depending on the order of execution.

17. Cascading rollbacks are not desirable.

18. Locking and timestamp ordering are optimistic techniques, as they are designed based on the assumption that conflict is rare.

19. Two types of locks are Read and Write locks.

20. In the two-phase locking, every transaction is divided into (a) growing phase and (b) shrinking phase.
21. A dirty read problem occurs when one transaction updates a database item and then the transaction fails for some reason.
22. The size of the locked item determines the granularity of the lock.
23. There is no deadlock in the timestamp method of concurrency control.
24. A transaction that changes the contents of the database must alter the database from one consistent state to another.
25. A transaction is said to be in committed state if it has partially committed, and it can be ensured that it will never be aborted.
26. Level 3 transaction consistency adds consistent reads so that successive reads of a record will always give the same values
27. A lost update problem occurs when two transactions that access the same database items have their operations in a way that makes the value of some database item incorrect.
28. Serialisability describes the concurrent execution of several transactions.

FILL IN THE BLANKS

1. Transaction is a .... of work that representes real-world events of any organisation or an enterprise, whereas concurrency control is the management of concurrent transaction execution.
2. .... is the activity of coordination the actions of processes that operate in parallel, access shared data, and therefore, potentially interfere with each other.
3. A simple way to detect a state of deadlock is for the system to construct and maintain a .... graph.
4. A transaction is a sequence of .... and .... actions that are grouped together to form a database.
5. .... is the ability of a DBMS to manage the various transactions that occur within the system.
6. Atomic transaction is a transaction in which either .... with the transaction are executed to completion or .... are performed.
7. The ACID properties of a transaction are (a) .... (b) .... (c) .... and (d) ....
8. .... means that execution of a transaction in isolation preserves the consistency of the database.
9. The .... of the DBMS ensures the atomicity of each transaction.
10. Transaction log is a .... of all .... and the corresponding changes to the ....
11. Ensuring durability is the responsibility of the .... of the DBMS.
12. Isolation property of transaction means that the data used during the execution of a transaction cannot be used by .... until the first one is completed.
13. A consistent database state is one which all .... constraints are satisfied.
14. A transaction that changes the contents of the database must alter the database from one .... to another.
15. The isolation property is the responsibility of the .... or DBMS.
16. A transaction that completes its execution successfully is said to be ....
17. Level 2 transaction consistency isolates from the .... of other transactions.
18. When a transaction has not successfully completed its execution we say that it has ....

19. A .... is a schedule where the operations from a group of concurrent transactions are interleaved.

20. The objective of .... is to find non-serial schedules.

21. The situation where a single transaction failure leads to a series of rollbacks is called a ....

22. .... is the size of the data item chosen as the unit of protection by a concurrency control program.

23. Optimistic concurrency control techniques are also called .... concurrency scheme.

24. The only way to undo the effects of a committed transaction is to execute a ....

25. Collections of operations that form a single logical unit of work are called ....

26. Serialisability must be guaranteed to prevent .... from transactions interfering with one another.

27. Precedence graph is used to depict ....

28. Lock prevents access to a .... by a second transaction until the first transaction has completed all of its actions.

29. A shared/exclusive (or Read /Write) lock uses .... lock.

30. A shared lock exists when concurrent transaction are granted .... access on the basis of a common lock.

31. Two-phase locking is a method of controlling .... in which all locking operations precede the first unlocking operation.

32. In a growing phase, a transaction acquired locks without .... any data.

33. In a shrinking phase, a transaction releases .... and cannot obtain any .... lock.

ANSWERS

TRUE/FALSE :
1. True   2. True   3. True   4. True   5. True   6. True   7. False   8. True   9. True
10. True   11. True   12. True   13. True   14. False   15. True   16. True   17. True
18. True   19. True   20. True   21. True   22. True   23. True   24. True   25. True
26. True   27. True   28. True.

FILL IN THE BLANKS :
1. Logical unit,   2. Concurrency control ,   3. Wait-for-graph,   4. Read, Write,
5. Concurrency control,   6. All actions associated, none,   7. (a) Atomicity, (b) Consistency,
(c) Isolation, (d) Durability   8. Isolation,   9. Transaction recovery subsystem,   10. Record,
transactions,   database,   11. Recovery   subsystem,   12. A   second   transaction,   13. Data
integrity,   14. Consistent   state,   15. Concurrency   control,   16. Committed,   17. Updates,
18. Aborted,   19. Non-serial   schedule,   20. Serializability,   21. Cascading   rollback,   22.
Granularity,   23. Validation   or   certification   method,   24. Rollback,   25. Transaction,   26.
Inconsistency,   27. Serializability,   28. Database record,   29. Multiple-mode,   30. READ,
31. Concurrent processing,   32. Unlocking,   33. All locks, new.

STATE TRUE/FALSE

1. Concurrency control and database recovery are intertwined and both are a part of the transaction management.

2. Database recovery is a service that is provided by the DBMS to ensure that the database is reliable and remains in consistent state in case of a failure.

3. Database recovery is the process of the database to a correct (consistent) state in the event of a failure.

4. Forward recovery is the recovery procedure, which is used in case of physical damage.

5. Back ward recovery is the recovery procedure, which is used in case an error occurs in the midst of normal operation on the database.

6. Media failures are the most dangerous failures.

7. Media recovery is performed when there is a head crash (record scratched by a phonograph needle) on the disk.

8. The recovery process is closely associated with the operating system.

9. Shadow paging technique does not require the use of a transaction log in a single-user environment.

10. In shadowing both the before-image and after-image are kept on the disk, thus, avoiding the need for a transaction log for the recovery process.

11. The REDO operation updates the database with new values (after-image) that is stored in the log.

12. The REDO operation copies the old values from log to the database, thus, restoring the database prior to a state before the start of the transaction.

13. In case of deferred updata technique, updates are not written to the database until after a transaction has reached its COMMIT point.

14. In case of an immediate update technique, all updates to the database are applied immediately as they occur with waiting to reach the COMMIT point and a record of all changes is kept in the transaction log.

15. A checkpoint is point of synchronisation between the database and the transaction log file.

16. In checkpointing, all buffers are force-written to secondary storage.

17. The deferred update technique is also known as the UNDO/REDO algorithm.

18. Shadow paging is a technique where transaction log are not required.

19. Recovery restores a database form a given state, usually inconsistent, to a previously consistent state.

20. The assignment and management of memory blocks is called the buffer manager.

FILL INTHE BLANKS

1. .... is a process of restoring a database to the correct state in the even of a failure.

2. If only the transaction has to be undone, then it is called ....

3. When all the active transactions have to be undone, then it is called ....

4. If all pages updated by a transaction are immediately written to disk when the transaction commits this ....

5. If the pages are flushed to the disk only when they are full or at some time interval, then it is called ....

6. Shadow paging technique does not require the use of a transaction log in .... environment.

7. Shadow paging technique is classified as .... algorithm.

8. Concurrency control and database recovery are intertwind and are both part of ....

9. Recovery is required to protect the database from (a) .... and (b) ....

10. The failure may be the result of (a)..........., (b)..........., (c)...............

11. Recovery restore a database from a given state, usually ...., to a ....state.

12. The database backup is stored in a secure place, usually in (a) .... and (b) .... such as fire, theft, flood and other potential calamities.

13. System crashes are due to hardware or software errors, result in loss of ....

14. In the even of failure, there are two principal effects that happen, namely (a) .... and (b)................

15. Media recovery is performed when there is .... on the disk.

16. In case of deferred update technique, updates are not written to the database until after a transaction has reached.

17. In case of immediate updata technique, updates to the database are applied immediately as they occur .... to reach the COMMIT point and a record of all changes is kept in the ....

18. Shadow paging technique maintains two page tables during the life of a transaction namely (a) .... and (b) ....

19. In checkpointing, all buffers are .... to secondary storage.

20. The assignment and management of memory blocks is called .... and the component of the operating system that perform this task is called ....

ANSWERS

TRUE AND FALSE :
1. True   2. True   3. True   4. True   5. True   6. True   7. True   8. True   9. True
10. True   11. Ture   12. False   13. True   14. True   15. True   16. True   17. False
18. True   19. True   20. True

FILL IN THE BLANKS :
1. Database recovery ,   2. Rollback,   3. Global undo,   4. Force approach, force writing,
5. No force approach,   6. A single-user ,   7. NO-UNDO/NO-REDO,   8. Transaction management,   9. (a) data inconsistencies, (b) data loss,   10. (a) hardware failure, (b) software failure, (c) media failure, (d) network failure,   11. Inconsistent state, consistent,
12. (a) different building, (b) protected sagainst danger ,   13. Main memory,   14. (a) loss of main memory including the database buffer, (b) the loss of the disk copy (secondary storage) of the database, 15. Head crash (record scratched by a phonograph needle),   16. COMMIT point,
17. Without waiting, transaction log ,   18. (a) a current page table, (b) a shadow page table,
19. Force-written,   20. Buffer management, buffer manager.

STATE TRUE/FALSE

1. In a distributed database system, each site is typically managed by a DBMS that is dependent on the other sites.

2. Distributed database systems arose from the need to offer local database autonomy at geographically distributed locations.

3. The main aim of client/server architecture is to utilise the processing power on the desktop while retaining the best aspect to centralised data processing.

4. Distributed transaction atomicity property enables users to ask queries without specifying where the reference relations, or copies or fragments of the relations are located.

5. Distribute data independence property enables users to write transactions that access and update data at several sites just as they would write transaction over purely local data.

6. Although geographically dispersed, a distributed database system manages and controls the entire database as a single collection of data.

7. In homogeneous DDBS, there are several sites, each running their own applications on the same DBMS software.

8. In heterogeneous DDBS, different sites run under the control of different DBMSs, essentially autonomously and are connected some how to enable access to data from multiple sites.

9. A distributed database system allows applications to access data from local and remote databases.

10. Homogeneous database systems have well-accepted standards for gateway protocols to expose DBMS functionality to external applications.

11. Distributed database do not use client/ server architecture.

12. In the client/server architecture, client is the provider of the resource whereas the server is a user of the resource.

13. In the client/server architecture does not allow a single query to span multiple servers.

14. A horizontal fragmentation is produced by specifying a predicate that performs a restriction on the tuples in the relation.

15. Data replication is used to improve the local database performance and protect the availability of applications.

16. Transparency in data replication makes the user unaware to the existence of the copies.

17. The server is the machine that runs the DBMS software and handles the functions required for concurrent shared data access.

18. Data replication enhances the performance of read operations by increasing the processing speed at site.

19. Data replication decreases the availability of data to read-only transactions.

20. In distributed locking, the DDBS maintains a lock manager at each site whose function is to administer the lock and unlock requests for those data items that are stored at that site.

21. In distributed systems, each site generates unique local timestamp using either a logical counter or the local clock and concatenates it with the site identifier.

22. In a recovery control, transaction atomicity must be ensured.

23. The two-phase commit protocol guarantees that all database servers participating in a distributed transaction either all commit or all abort.

24. The use of 2PC is not transparent to the users.

FILL IN THE BLANKS

1. A distributed database system is a database physically stored on several computer systems across .... connected together via ....

2. Distributed database systems arose from the need to offer local database autonomy at .... locations.

3. .... is an architecture that enables distributed computing resources on a network to share common resources among groups of users of intelligent workstations.

4. The two desired properties of distributed databases are (a) .... and (d) ....

5. .... is a database physically stored in two or more computer systems.

6. Heterogeneous distributed database system is also referred to as a .... or ....

7. Client/server architectures are those in which a DBMS-related workload is split into two logical components namely (a) .... and (b)

8. The client/server architecture consists of the four main components namely (a) .... (b) .... (c) .... and (d) ....

9. Three main advantages of distributed databases are (a) .... (b) .... and (c) ....

10. Three main disadvantages of distributed databases are (a) .... (b) .... and (c) ....

11. The middleware database architecture is also called ....

12. The middleware is basically a layer of .... which works as special server and coordinates the execution of .... and .... across one or more independent database servers.

13. A horizontal fragment of a relation is a subset of .... with all................. in that relation.

14. In horizontal fragmentaion, ... operation is done to reconstruct the original relation.

15. Data replication enhances the performance of read operations by increasing the .... at site.

16. Data replication has increased overheads for .... transaction.

17. In a distributed query processing, simijoin operation is used to reduce the .... of a relation that need to be transmitted and hence the .... transaction.

18. In a distributed database deadlock situation, LWFG stand for ....

19. In a distribute database deadlock situation, GWFG stand for ....

20. In the DDBSs, each copy of the data item contains two timestamp values namely (a) .... and (b) ....

21. Two-phase commit protocol has two phases namely (a) .... and (b) ....

22. 3PC protocol avoids the .... limitation of two-phase commit protocol.

ANSWERS

STATE TRUE/FALSE :
1. True   2. True   3. True   4. False   5. False   6. True   7. True   8. True   9. True
10. False   11. False   12. False   13. True   14. True   15. True   16. True   17. True
18. True   19. False   20. True   21. True   22. True   23. True   24. False.

FILL IN THE BLANKS :
1. Several sites, communication network,   2. Geographically distributed,   3. Client server architectures,   4. (a) Provide local autonomy, (b) Should be location independent,
5. Distributed database system (DDBS),   6. A multi-database system, a federated database system (FDBS),   7. (a) client, (b) server,   8. (a) Clients, inform of intelligent workstations as the user's contact point, (b) DBMS server as common resources performing specialized tasks for devices requesting their services, (c) Communication network connecting the clients and the servers, (d) Software application connecting clients, servers and networks to create a single logical architecture,   9. (a) sharing of data, (b) increased efficiency, (c) increased local autonomy,
10. (a) Recovery of failure is more complex, (b) Increased software development cost, (c) Lack of standards,   11. Data access middleware,   12. Software, queries, Transactions,   13. Tuples (or rows), attributes,   14. UNION,   15. Processing speed,   16. Update transaction,   17. Size, communication,   18. Local wair-for graph,   19. Global wait-for graph,   20. (a) read timestamp, (b) the write timestamp,   21. (a) voting phase, (b) decision phase,   22. Blocking.

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B-Tech.

FIFTH SEMESTER EXAMINATION, 2005-2006
Database Management System

Time : 2 Hours   *Total Marks : 50*

Note : (i)   Attempt All questions.

         (ii)   In case of numerical problems assume data wherever not provided.

       (iii)   Be precise in your answer.

1. **Attempt any four of the following questions :**   **(3 × 4 = 12)**

    (a) Define the following terms :
       (i) Database System   (ii) End User
      (iii) DML   (iv) DDL

    (b) Distinguish between a file processing system and a DBMS.

    (c) What is the difference between logical data independence and physical data independence?

    (d) Construct an E-R diagram for a hospital with a set of patients and a set of medical doctors. Associate with each patient, a log of the various tests and examination conducted.

<div align="center">OR</div>

    Draw E-R relationship diagram showing the cardinality for the following :
    A operator can work on many machines and each machine has many operators. Each machine belongs to one department but a department can have many machines.

    (e) When is the concept of a weak entity useful in data modelling? Define the terms : owner entity type and weak entity type.

    (f) What is the difference between procedural and non-procedural DMLs.

2. **Attempt any two of the following questions :**   **(7 × 2 = 14)**

    (a) How does the relational calculus differs from relational algebra and how they are similar? Explain with some suitable example.

    (b) Consider the following scheme :
    DEALER (DEALER_ID, DEALER_NAME, DEALER_ADDRESS)
    PARTS (PART_ID, PART_NAME, COLOUR)
    CATALOG (DEALER_ID, PART_ID, COST)
    Write the following query in Relational Algebra and SQL :
    (i) Find the name of the Dealers who supply red parts.
    (ii) Find the name of Dealers who supply both yellow and green parts.
    (iii) Find the name of the Dealers who supply all parts.

    (c) Discuss the various update operations on relations and the type of integrity constraint that must be checked for each update operation.

3. **Attempt any two of the following questions :**   (6 × 2 = 12)

   (a) Write notes on the following :
      (i) Functional Dependency or 4 NF
      (ii) Normal Forms

   (b) Consider the scheme $S = (V, W, X, Y, Z)$. Suppose the following functional dependencies hold :

$$Z \rightarrow V$$
$$W \rightarrow Y$$
$$XY \rightarrow Z$$
$$V \rightarrow WX$$

   State whether the following decomposition of scheme S is lossless join decomposition. Justify your answer :
      (i) $S_1 = (V, W, X)$
         $S_2 = (V, Y, Z)$
      (ii) $S_1 = (V, W, Z)$
         $S_2 = (X, Y, Z)$

   (c) What do you understand by fifth normal forms? Explain with some suitable example.

4. **Attempt any two of the following questions :**   (6 × 2 = 12)

   (a) Write notes on the following :
      (i) Dead lock
      (ii) Two phase locking protocol

   (b) What do you understand by serializability of schedules? Explain with some suitable example.

   (c) What is the transaction system? How would you make recovery from transaction failures? Explain with some suitable examples.

MCA

THIRD SEMESTER EXAMINATION, 2005-2006
Database Management System

Time : 3 Hours   *Total Marks : 100*

Note : (i)   Attempt All questions.
        (ii) All Questions carry equal marks.
        (iii) In case of numerical problems assume data wherever not provided.
        (iv) Be precise in your answer.

1. **Attempt any Four parts :**   (5 × 4 = 20)
   (a) Define the following terms :
       (i)   Data abstraction
       (ii) Data independency
       (iii) Database schema
       (iv) Data redundancy
       (v)   DDL & DML
   (b) Discuss the rule of the Data Base Administrator (DBA) in Data Base Management System.
   (c) Explain three level architecture of DBMS in detail.
   (d) Define the terms Generalization, Specialization and Aggregation with a suitable example.
   (e) Draw the E-R diagram of the registration process of the student in a particular course. Convert the E-R diagram into tables also.

2. **Attempt any Two parts :**   (10 × 2 = 20)
   (a) Consider the following three relation schema S, P and SP in which S# is supplier code, P# product code and Qty is Quantity and others carry their respective meanings.
       S(S#, SNAME, SCITY, TURNOVER)
       P(P#, WEIGHT, COLOR, COST, SELLING PRICE)
       SP(S#, P#, QTY)
       Write the appropriate SQL and relational algebra statements for the following queries.
       (i)   Get all details of supplier who operate from DELHI with TURNOVER = 80.
       (ii) Get part nos. weighting between 25 and 35.
       (iii) Get the names of suppliers whose name begins with A.
       (iv) For each part supplied, get part no. and names of all cities supplying the part.
       (v)   Get the names of suppliers who supply part no. 2.
   (b) A university has many departments. Each department may have many full-time and part-time students. Each department may float multiple courses for its own students. Each department has staff members who may be full time or part-time. Design a generalization, specialization hierarchy for the university.
   (c) Define the following terms :
       (i)   Integrity Constraints
       (ii) Foreign Key
       (iii) Primary Key
       (iv) Super Key
       (v)   Candidate Key

(d) Consider the following tables :

P				Q				R
A	**B**	**C**		**A**	**B**	**C**		**J**
a	b	c		c	b	a		J_1
b	c	a		b	a	c		J_2
c	a	b		b	c	a		J_3

Perform the following relational algebra operations.

(i) $P \cup Q$

(ii) $P \cap Q$

(iii) $P - Q$ and $Q - P$

(iv) $P \times R$ and $Q \times R$

(e) What do you mean by View? Discuss the advantages and disadvantages of View in detail.

3. **Attempt any Two parts :**   **(10 × 2 = 20)**

(a) (i) Discuss the various anomalies associates with relational database management system by giving suitable examples.

(ii) Consider the following relational schema :

R (A, B, C, D, E, F, G, H) with the FDs

AB → C, BC → C, E → F, G → F, H → A, FG → H.

Is the decomposition of R into R_1 (A, B, C, D), R_2 (A, B, C, E, F), R_3 (A, D, F, G, H) lossless? Is it dependency preserving?

(b) What is join dependency? How is it different to that of Multivalued and Functional dependency? Give an example each of join and multivalued dependency. Discuss the Fourth Normal Form (4 NF) also in detail.

(c) What do you mean by Functional Dependency? Explain BCNF with a suitable example. "A decomposition in BCNF may be lossless and dependency preserving". Is this statement correct? Justify your answer with a suitable example.

4. **Attempt any Two parts :**   **(10 × 2 = 20)**

(a) What is deadlock? When does it occur? How is it detected in database system? How can it be avoided? Discuss in detail.

(b) What do you mean by Transaction system? List the ACID properties of transaction. Discuss the recovery from transaction failures also.

(c) What do you mean by Serializability? Discuss the conflict and view serializability with suitable example. Discuss the testing of serializability also.

5. **Attempt any Two parts :**   **(10 × 2 = 20)**

(a) What is multi-version schemes of Concurrency Control? Describe with the help of an example. Discuss the various time stamping protocols for concurrency control also.

(b) What do you mean by Multiple Granularity? Discuss with a suitable example. Discuss the validation based protocols also with a suitable example.

(c) What is two phase locking? Describe with the help of an example. Will two phase locking result in deadlock? Justify your answer with the help of an example. Discuss the Recovery with Concurrent transactions also.

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MCA

THIRD SEMESTER EXAMINATION, 2006-2007
Database Management System

Time : 3 Hours   *Total Marks : 100*

Note : (i)   Attempt All questions.

       (ii)   All Questions carry equal marks.

      (iii)   Be precise in your answer.

1.   **Attempt any four parts of the following :**   (5 × 4 = 20)

   (a)   How is it possible to get more information from the same amount of data by using a database approach as opposed to a file approach?

   (b)   Define redundancy. Can data redundancy be completely eliminated when database approach is used?

   (c)   Draw E.R. diagram for departmental store, after determining the entities of interest and the relationship that exist between those entities. Also construct a tabular representation of the entities and the relationship. Are there any attributes in each entity set that would uniquely identify and instance of the entity set?

   (d)   Explain the distinction between total and partial constraints with suitable example.

   (e)   How representation of association and relationship in network and hierarchical model can be different?

   (f)   Define the concept of aggregation with at least two example where these concept is useful.

2.   **Attempt any four parts of the following :**   (5 × 4 = 20)

   (a)   In what sense relational calculus differ from relational algebra and in what sense they are similar?

   (b)   What is view? List two reasons why we may choose to define a view.

   (c)   Let R = (A, B, C) and r_1, r_2 both be relations on schema R. The expression in the domain relational calculus for the following :

     (i) $\pi A(r_1)$

     (ii) $\pi_{A, B} (r_1) \bowtie \pi_{B. C} (r_2)$

     (iii) $r_1 - r_2$

   (d)   Consider the given insurance database, where primary keys are underlined construct the given SQL–queries for the relational database, person (driver-id #, name, address)

   car (license, model year)

   accident (report-number, data, location)

   owns (driver-id #, license)

   participated (driver-id #, report-number, damage amount)

     (i)   Add a new accident to the database; assume any value for required attributes.

     (ii)   Update the damage amount for the car with licence number "AABB2000" in the accident with report number "AR 2197" to $ 3000.

(e) For the relation P and Q as given. Perform the following operation and show the resulting relation :

P

A	B	C	D
a_1	b_2	c_2	d_2
a_2	b_1	c_1	d_2
a_1	b_1	c_2	d_1
a_2	b_1	c_2	d_2
a_1	b_2	c_1	d_2
a_3	b_1	c_2	d_1
a_1	b_2	c_2	d_2
a_2	b_1	c_1	d_2
a_1	b_3	c_2	d_2

Q

B	C	D
b_1	c_1	d_2
b_3	c_1	d_2
b_2	c_2	d_1
b_1	c_1	d_2
b_3	c_2	d_2

   (i) Find the projection of Q on the attributes (B, C).

   (ii) Divide P by the relation that is obtained by first selecting those tuples of Q where the value of B is either b_1 or b_2 and then projection Q on the attributes (C, D).

(f) What is view? Explain the advantage of cursor in SQL?

3. **Attempt any two parts of the following :**   **(10 × 2 = 20)**

(a) (A → BCDE, B → ACDE, C → ABDE),
Give the lossless decomposition of R

(b) Explain why 4 NF is more desirable than BCNF.

(c) Using the knowledge of college environment, determine functional dependencies that exists in the following table. After these have been determined, convert this table to an equivalent collection to tables that are in 3 NF.
Student [(Student Number, Student Name, Number credits, Advison Number, Advison Name, Dept Number, Dept. Name), (Course Number, Course description, Course term, Grade)].

4. **Attempt any two parts of the following :**   **(10 × 2 = 20)**

(a) Explain two phase commit protocol. How is it performed show with example?

(b) Differentiate check point mechanism with logging facility.

(c) Consider the precedence graph given in figure and check which type of serializable is it. Explain your answer.
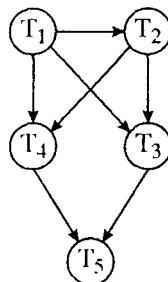
5.   **Attempt any two parts of the following :**   (10 × 2 = 20)

    (a) In timestamp ordering w-timestamp (Q) denotes the largest timestamp that executes write (Q) successfully. If we define it to be timestamp of most recent transaction to execute write (Q) successfully. Is there any difference? Justify your answer.

    (b) Discuss the advantage and disadvantage of centralized time stamping and distributed time stamping.

    (c) Explain notions of transparency and autonomy? Also explain multimaster replication.

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MCA

THIRD SEMESTER EXAMINATION, 2007-2008
Database Management System

Time : 3 Hours   *Total Marks : 100*

Note :   (i)   Attempt All questions.
            (ii)   Each question carry equal marks.

1. **Attempt any four parts of the following :**   **(5 × 4 = 20)**

   (a) Explain the difference between a file oriented system and a database oriented system.

   (b) Construct an E-R model for a car insurance company whose customers own one or more cars each. Each car has associated with it zero to any no. of recorded incidents.

   (c) List all the database users. Explain sophisticated and specialized users.

   (d) What is meant by a recursive relation type? Explain with an example.

   (e) Describe various types of data model? How these differ from each other; explain in brief.

   (f) A weak entity set can always be made into a strong entity set by adding to its attributes to its identifying entity set. Outline what sort of redundancy will result if we do so?

2. **Attempt any four parts of the following :**   **(5 × 4 = 20)**

   (a) Draw the basic architecture of DBMS system (oracle 8i).

   (b) Employee (emp_id, emp_name, emp_street, emp_city)
       works (emp_id, company_id, salary)
       located in (company_code, company_name, company_city)
       Write queries in relational algebra :
       (1) Find the names of all employees who work for a company located at "Delhi".
       (2) Find the names of the employees who work for the company located at city in which they live.
       (3) Find the names of the employee who work in company "TCS".

   (c) What is a foreign key constraint? Why are such constraints important?

   (d) Design relational database corresponding to E-R diagram :
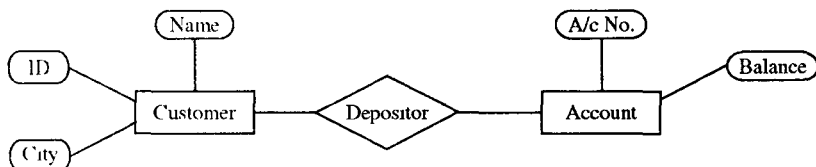
   (e) Which commands are DDL parts of SQL? Write their syntax.

   (f) Explain by example following operations : join, union, minus, update, insert.

3. **Attempt any four parts of the following :**   **(5 × 4 = 20)**

   (a) What are the design goals of a good relational database?

   (b) Prove with suitable example that BCNF is stronger than 3NF.

   (c) Consider the scheme $R = (A, B, C, D, E)$. Suppose following FD's hold :
       $$F = \{E \rightarrow A, CD \rightarrow E, A \rightarrow BC, B \rightarrow D\}$$

State whether following decomposition of **R** are lossless join decomposition or not. Justify your answer :

(1) {(A, B, C), (A, D, E)}

(2) {(A, B, C), (C, D, E)}

(d) What do you mean by Armstrong's axioms for finding FDs?

(e) Consider two set of functional dependencies :

$$F_1 = \{A \to C, AC \to D, E \to AD, E \to H\}$$

$$F_2 = \{A \to CD, E \to AH\}$$

check whether they are equivalent.

(f) Prove that if in a relation schema, the no. of attributes in a primary key is one, the schema will be at least in 2NF.

4. **Attempt any two of the following :**   (10 × 2 = 20)

(a) What do you mean by a schedule? When is a schedule called serializable? What are conflict serializable schedules? Show whether the following schedules are conflict equivalent or not. Justify your statement.

Schedule 1   **Schedule 2**

T₁	T₂	T₁	T₂
Read (A)	.		Read (A)
Write (A)		Read (A)	
	Read (A)		Write (A)
	Write (A)	Write (A)	.

(b) Explain how the following differ :
Fragmentation, Replication transparency and Location transparency.

(c) Explain the reasons why recovery of interactive transaction are more difficult than recovery of batch transactions.

5. **Attempt any two parts of the following :**   (10 × 2 = 20)

(a) What are the different locking techniques for concurrency control?

(b) What is time stamp? List all the time stamp based protocols, check whether it is cascadeless and whether it is recoverable.

(c) Write short notes on the following :

(1) Estimation of cost and optimization of tuple transfer for join in distributed database.

(2) Multiple granularity and multiversion schemes.

□

● **Q. 1.   What is database?**
Ans. A database is a logically coherent collection of data with some inherent meaning, representing some aspect of real world and which is designed, built and populated with data for a specific purpose.

● **Q. 2.   What is DBMS?**
Ans. It is a collection of programs that enables user to create and maintain a database. In other words it is gereral-purpose software that provides the users with the processes of defining, constructing and manipulating the database for various applications.

● **Q. 3.   What is a Database system?**
Ans. The database and **DBMS** software together is called as Database system.

● **Q. 4.   Advantages of DBMS?**
Ans. (i) Redundancy is controlled.
(ii) Unauthorised access is restricted.
(iii) Providing multiple user interfaces.
(iv) Enforcing integrity constraints.
(v) Providing backup and recovery.

● **Q. 5.   Disadvantage in File Processing System?**
Ans. (i) Data redundancy and inconsistency.
(ii) Difficult in accessing data.
(iii) Data isolation.
(iv) Data integrity.
(v) Concurrent access is not possible.
(vi) Security problems.

● **Q. 6.   Describe the three levels of data abstraction ?**
Ans. There are three levels of abstraction :
(i) **Physical level :** The lowest level of abstraction describes how data are stored.
(ii) **Logical level :** The next higher level of abstraction, describes what data are stored in database and what relationship among those data.
(iii) **View level :**The highest level of abstraction describes only part of entire database.

● **Q. 7.   Define the "integrity rules"**
Ans. There are two Integrity rules.
(i) **Entity Integrity :** States that "Primary key cannot have NULL value"
(ii) **Referential Integrity :** States that "Foreign Key can be either a NULL value or should be Primary Key value of other relation.

● **Q. 8.   What is extension and intension?**
Ans. Extension — It is the number of tuples present in a table at any instance. This is time dependent.

Intension — It is a constant value that gives the name, structure of table and the constraint laid on it.

● **Q. 9.   What is System R? What are two major subsystems?**
Ans. System R was designed and developed over a preiod of 1974 -79 at IBM San Jose Research Center. It is a prototype and its purpose was to demonstrate that it is possible to build a Relational System that can be used in a real life environment to solve real life problems, with performance at least comparable to that of existing system. Its two subsystems are
(i) Research Storage
(ii) System Relational Data System.

● **Q. 10.   How is the data structure of System R different from the relationl structure?**
 Ans. Unlike Relational systems in System R
(i) Domains are not supported
(ii) Enforcement of candidate key uniqueness is optional
(iii) Enforcement of entity integrity is optional
(iv) Referential integrity is not enforced

● **Q. 11.   What is Data Independence?**
Ans. Data independence means that "the application is independent of the storage structure and access strategy of data". In other words, the ability to modify the schema definition in one level should not affect the schema definition in the next higher level. Two types of Data Independence:
(i) Physical Data Independence : Modification in physical level should not affect the Logical level.
(ii) Logical Data Independence : Modification in logical level should not affect the view level.
Note : Logical Data Independence is more difficult to achieve

● **Q. 12.   What is a view? How it is related to data independence?**
Ans. A view may be thought of as a virtual table, that is, a table that does not really exist in its own right but is instead derived from one or more underlying base table. In other words, there is no stored file that direct represents the view instead a definition of view is stored in data dictionary. Growth and restructuring of base tables is not reflected in views. Thus, the view can insulate users from the effects of restructuring and growth in the database. Hence accounts for logical data independence.

● **Q. 13.   What is Data Model?**
Ans. A collection of conceptual tools for describing data, data relationships data semantics and constraints.

● **Q. 14.   What is E-R model?**
Ans. This data model is based on real world that consists of basic objects called entities and of relationship among these objects. Entities are described in a database by a set of attributes.

● **Q. 15.   What is Object Oriented model?**
Ans. This model is based of collection of object. An object contains values stored in instance variables with in the object. An object also contains bodies of code that operate on the object. These bodies of code are called methods. Objects that contain sace types of values and the same methods are grouped together into classes.

- **Q. 16. What is an Entity?**
  Ans. It is a 'thing' in the real world with an independent existence.

- **Q. 17. What is an Entity type**
  Ans. It is a collection (set) of entities that have same attributes.

- **Q. 18. What is an Entity type set?**
  Ans. It is a collection of all entities of particular entity type in the database.

- **Q. 19. What is an Extension of entity type?**
  Ans. The collection of entites of a particular entity type are grouped together into an entity set.

- **Q. 20. What is Weak Entity set?**
  Ans. An entity set may not have sufficient attributes to form a primary key, and its primary key compromises of its partial key and primary key of its parent entity, then it is said Weak Entity set.

- **Q. 21. What is an attribute?**
  Ans. It is a particular property, which describes the entity.

- **Q. 22. What is a Relation Schema and a Relation ?**
  Ans. A relation Schema denoted by R (A1, A2,..., An) is made up of the relation name R and the list of attributes A1 that it contains. A relation is defined as a set of tuples. Let r be the relation which contains set tuples (t1, t2, t3,...tn). Each tuple is an ordered list of n-values $t = (v1, v2,...vn)$.

- **Q. 23. What is degree of a Relation ?**
  Ans. It is the number of attribute of its relation schema.

- **Q. 24. What is Relationship ?**
  Ans. It is an association among two or more entites.

- **Q. 25. What is Relationship set?**
  Ans. The collection (or set) of similar relationships.

- **Q. 26. What is Relationship type ?**
  Ans. Relationship type defines a set of associations or a relationship set among a given set of entity types.

- **Q. 27. What is degree of Relationship type ?**
  Ans. It is the number of entity type participating.

- **Q. 28. What is DDL (Data Definition Language)?**
  Ans. A database schema specifies by a set of definitions expressed by a special language called DDL.

- **Q. 29. What is VDL (View Definition Language)?**
  Ans. It specifies user views and their mappings to the conceptual schema

- **Q. 30. What is Data Storage-Definition Language?**
  Ans. The storage structures and access methods used by database system are specified by a set of definition in a special type of DDL called data storage-definition language.

- **Q. 31. What is DML (Data Manipulation Language)?**
  Ans. This language that enable user to access or manipulate data as organised by appropriate data model.
  Procedural DML or Low level : DML requires a user to specify what data are needed and how to get those data.
  Non-Procedural DML or High level: DML requires a user to specify what data are needed without specifying how to get those data.

- **Q. 32. What is VDL (View Definition Language)?**
  Ans. It specifies user views and their mappings to the conceptual schema.

- **Q. 33. What is DML Compiler?**
  Ans. It translates DML statements in a query language into low-level instruction that the query evaluation engine can understand.

- **Q. 34. What is Query evaluation engine?**
  Ans. It executes low-level instruction generated by compiler.

- **Q. 35. What is DDL Interpreter?**
  Ans. It interprets DDL statements and record them in tables containing metadata.

- **Q. 36. What is Record-at-a-time-?**
  Ans. The low level or Procedural DML can specify and retrieve each record from a set of records. This retrive of a record is said to be Record-at-a-time.

- **Q. 37. What is Set-at-a-time or Set-oriented?**
  Ans. The High level or Non-procedural DML can specify and retrive many records in a single DML statement. This retrive of a record is said to be set-at-a-time or Set-oriented.

- **Q. 38. What is Relational Algebra?**
  Ans. It is procedural query language. It consists of a set of operations that take one or two relations as input and produce a new relation.

- **Q. 39. What is Relational Calculus?**
  Ans. It is an applied predicate calculus specifically tailored for relational databases proposed by E.F. Codd, *e.g.,* of languages based on it are DSL ALPHA, QUEL.

- **Q. 40. How does Tuple-oriented relational calculus differ from domain-oriented relational calculus ?**
  Ans. The tuple-oriented calculus uses a tuple variables, *i.e.,* variable whose only permitted values are tuples of that relation, *e.g.,* QUEL.
  The domain-oriented calculus has domain variables, *i.e.,* variables that range over the underlying domains instead of over relation, *e.g.,* ILL, DEDUCE.

- **Q. 41. What is normalization?**
  Ans. It is a process of analysing the given relation schemas based on their Functional Dependencies (FDs) and primary key to achieve the properties
  (i) Minimizing redundancy
  (ii) Minimizing insertion, deletion amd update anomalies.

- **Q. 42. What is Functional Dependency?**
  Ans. A Functional dependency is denoted by $X \rightarrow Y$ between two sets of attributes X and Y that

are subsets of R specifies a constraint on the possible tuple that can form a relation state r of R. The constraint is for any two tuples t1 and t2 in r if $t1[X] = t2[X]$ then they have $t1[Y] = t2[Y]$. This means the value of X component of a tuple uniquely determines the value of component Y.

- **Q. 43. When is a functional dependency F said to be minimal?**
  Ans. (i) Every dependency in F has a single attribute for its right hand side.
  (ii). We cannot replace any dependency $X \rightarrow A$ in F with a dependency $Y \rightarrow A$ where Y is a proper subset of x and still have a set of dependency that is equivalent to F.
  (iii) We cannot remove any dependency from F and still have set of dependency that is equivalent to F.

- **Q. 44. What is Multivalued dependency?**
  Ans. Multivalued dependency denoted by $X \rightarrow\rightarrow Y$ specified on relation schema R, where X and Y are both subsets of R, specifies the following constraint on any relation r of R: if two tuples t1 and t2 exist in r such that $t1[X] = t2[X]$ then t3 and t4 should also exist in r with the following properties

  $$t3[X] = t4[X] = t1[X] = t2[X]$$

  $$t3[Y] = t1[Y] \text{ and } t4[Y] = t2[Y]$$

  $$t3[Z] = t2[Z] \text{ and } t4[Z] = t1[Z]$$

  where $[Z = (R - (XUY))]$

- **Q. 45. What is Lossless join property?**
  Ans. It guarantees that the spurious tuple generation does not occur with respect to relation schemas after decomposition.

- **Q. 46. What is 1 NF (Normal Form) ?**
  Ans. The domain of attribute must include only atomic (simple, indivisible) values.

- **Q. 47. What is Fully Functional dependency?**
  Ans. It is based on concept of full functional dependency. A functional dependency $X \rightarrow Y$ is full functional dependency if removal of any attribute A from X means that the dependency does not hold any more, i.e., $\{X - A\} \not\rightarrow Y$.

- **Q. 48. What is 2NF?**
  Ans. A relation schema R is in 2NF if it is in 1NF and every non-prime attribute A in R is fully functionally dependent on primary key.

- **Q. 49. What is 3NF?**
  Ans. A relation schema R is in 3NF if it is in 2NF and for every FD $X \rightarrow A$ either of the following is true
  (i) X is a Super-key of R.
  OR (ii) A is a prime attribute of R.
  In other words, if every non prime attribute is non-transitively dependent on primary key.

- **Q. 50. What is BCNF (Boyce-Codd Normal Form)?**
  Ans. A relation schema R is in BCNF if it is in 3NF and satisfies an additional constraint that for every FD $X \rightarrow A$, X must be a candidate key.

● **Q. 51. What is 4NF?**

Ans. A relation schema R is said to be in 4NF if for every Multivalued dependency $X \twoheadrightarrow Y$ that holds over R, one of following is true

(i) X is subset or equal to (or) $X \twoheadrightarrow Y = R$.

(ii) X is a super key.

● **Q. 52. What is 5NF?**

Ans. A Relation schema R is said to be 5NF if for every join dependency $\{R\,1, R\,2\,,..., Rn\}$ that holds R, one the following is true

(i) $R\,i = R$ for some i.

(ii) The join dependency is implied by the set of FD, over R in which the left side is key of R.

Note : ONF : Optimal Normal Form

A model limited to only simple (elemental) facts, as expressed in Object Role Model notation.

DKNF : Domain-Key Normal Form

A model free from all modification anomalies.

Remember, these normalization guidelines are cumulative. For a database to be in 3NF, it must first fulfill all the criteria of a 2NF and 1NF database.

● **Q. 53. What is RDBMS?**

Ans. Relational Data Base Management Systems (RDBMS) are database management systems that maintain data records and indices in tables. Relationships may be created and maintained across and among the data and tables. In a relational database, relationships between data items are expressed by means of tables. Interdependencies among these tables are expressed by data values rather than by pointers. This allows a high degree of data independence. An RDBMS has the capability to recombine the data items from different files, providing powerful tools for data usage.

● **Q. 54. What is Stored Procedure?**

Ans. A stored procedure is a named group of SQL statements that have been previously created and stored in the server database. Stored procedures accept input parameters so that a single procedure can be used over the network by several clients using different input data. And when the procedure is modified, all clients automatically get the new version. Stored procedures reduce network traffic and improve performance. Stored pocedures can be used to help ensue the integrity of the database.

e.g. sp_helpdb, sp_renamedb, sp_depends etc.

● **Q. 55. What is cursors?**

Ans. Cursor is a database object used by applications to manipulate data in a set on a row-by-row basis, instead of the typical SQL commands that operate on all the rows in the set at one time.

In order to work with a cursor we need to perform some steps in the following order :

• Declare cursor

• Open cursor

• Fetch row from the cursor

• Process fetched row

• Close cursor

• Deallocate cursor

● **Q. 56. What it Trigger?**

Ans. A trigger is a SQL procedure that initiates an action when an event (INSERT, DELETE or

UPDATE) occurs. Triggers are stored in and managed by the DBMS. Triggers are used to maintain the referential integrity of data by changing the data in a systematic fashion. A trigger cannot be called or executed; the DBMS automatically fires the trigger as a result of a data modification to the associated table. Triggers can be viewed as similar to stored procedures in that both consist of procedural logic that is stored at the database level. Stored procedures, however, are not event-drive and are not attached to a specific table as triggers are. Stored procedures are explicitly executed by invoking a CALL to the procedure while triggers are implicitly executed. In addition, triggers can also execute stored procedures.

Nasted Trigger: A trigger can also contain INSERT, UPDATE and DELETE logic within itself, so when the trigger is fired because of data modification it can also cause another data modification, thereby firing another trigger. A trigger that contains data modification logic within itself is called a nested trigger.

● **Q. 57. What is View?**

Ans. A simple view can be thought of as a subset of a table. It can be used for retrieving data, as well as updating or deleting rows. Rows updated or deleted in the view are updated or deleted in the table the view was created with. It should also be noted that as data in the original table changes, so does data in the view, as views are the way to look at part of the original table. The results of using a view are not permanently stored in the database. The data accessed through a view is actually constructed using standard T-SQL select command and can come from one to many different base tables or even other views.

● **Q. 58. What is Index?**

Ans. An index is a physical structure containing pointers to the data Indices are created in an existing table to locate rows more quickly and efficiently. It is possible to create an index on one or more columns of a table, and each index is given a name. The users cannot see the indexes, they are just used to speed up queries. Effective indexes are one of the best ways to improve performance in a database application. A table scan happens when there is no index avaliable to help a query. In a table scan SQL Server examines every row in the table to satisfy the query results. Table scans are sometimes unavoidable, but on large tables, scans have terrific impact on performance.

Clustered indexes define the physical sorting of a database tables rows in the storage media. For this reason, each database table may have only one clustered index. Non-clustered indexes are created outside of the database table and contain a sorted list of references to the table itself.

● **Q. 59. Explain the persistent property for databases.**

Ans. Presistent means that data resides on stable storage such as a magnetic disk.

For example : Organizations need to retain data about customers, suppliers, and inventory on stable storage because these data are repetitively used. A variable in a computer program is not presistent because it resides in main memory and disappears after the program terminates. Persisitency does not mean that data lasts forever. When data are no longer relevant (such as a supplier going out of business), they are removed or achived.

● **Q. 60. Explain the inter- related property for databases.**

Ans. Inter-related means that data stored as separate units can be connected to provide a whole picture. For example, a customer database relates customer data (name, address, ...) to order data (order number, order data,...) to facilitate order processing. Databases contain both entities

and relationships among entities. An entity is a cluster of data usually about a single topic that can be accessed together. An entity may denote a person, place, thing, or event.

● **Q. 61. Explain the shared property for databases.**
Ans. Shared means that a database can have multiple uses and users. A database provides a common memory for multiple functions in an organization. For example, a personnel database can support payroll calculation, performance evalutions, government reporting requirements, and so on. Many users can use a database at the same time. For example, many customers can simultaneoulsy make airline reservations. Unless two users are trying to change the same part of the database at the same time, they can proceed without waiting.

● **Q. 62. What is the connection between nonprocedural access and application (form or report) development? Can nonprocedural access be used in application development?**
Ans. The connection between nonprocedural access and application (form or report) development is that non-procedual access is used in application development to indicate data requirements. Non-procedural access makes form and report creation possible without extensive coding. As part of creating a form or report, the user indicates the data requirements using a non-procedural language (SQL) or graphical tool.

● **Q. 63. What is difference between a form and a report?**
Ans. Data entry forms provide a convenient way to enter and edit data, while reports enhance the appearance of data that is displayed or printed.

● **Q. 64. What is a procedural language interface?**
Ans. A procedural language interface adds the full capabilities of a computer programming language. Non-procedural access and application development tools, though convenient and powerful, are sometimes not efficient enough or do not provide the level of control necessary for application development. When these tools are not adequate, DBMSs provide the full capabilities of a programming language. A procedural language interface combines a non-procedural language such as COBOL or Visual Basic.

● **Q. 65. What is a transaction?**
Ans. A transaction is a unit of work that should be processed reliably without interference from other users and without loss of data due to failures. Examples of transactions are withdrawing cash at an ATM, making an airline reservation, and registering for a course.

● **Q. 66. What features does a DBMS provide to support transaction processing?**
Ans. A DBMS ensures that transactions are free of interference from other users, parts of a transaction are not lost due to a failure, and transactions do not make the database inconsistent. Transaction processing is largely a "behind the scenes" affair. The user does not know the details about transaction processing other than the assurances about reliability.

● **Q. 67. What is an enterprise DBMS?**
Ans. An enterprise DBMS supports databases that are often critical to the functioning of an organization. Enterprise DBMSs usually run on powerful servers and have a high cost.

● **Q. 68. What is a desktop DBMS?**
Ans . A desktop DBMS runs on personal and small servers. It supports limited transaction processing features but has a much lower cost then an enterise DBMS. Desktop DBMSs support databases used by work teams and small businesses .

● **Q. 69.   What were the prominent features of first generation DBMSs?**

Ans. File structures and proprietary program interfaces were the prominent features of first generation database software.

● **Q. 70.   What were the prominent features of second generation DBMSs ?**

Ans. Networks and hierarchies of related records along with standard program interfaces were the prominent features of second generation database software.

● **Q. 71.   What were the prominent features of third generation DBMSs ?**

Ans. Non -procedural languages, optimization, and transaction processing were the prominent features of third generation database software.

● **Q. 72.   What are the prominent features of fourth generation DBMSs ?**

Ans. Support for multi-media data, active databases, data warehouses, and distributed processing are the prominent features of generation database software.

● **Q. 73.   For the database you described in question 1, make a table to depict differences among schema levels. Use Table 1-4 as a guide.**

Ans.

Schema level	Description
External	The registration form View, the report of grade View, the faculty assignment form View, and the report of faculty workload View
Conceptual	Student, Enrollment, Course, Faculty, and Enrollment tables and relationships
Internal	Files needed to store the tables; extra files to improve performance

● **Q. 74.   In a client-server architecture, why are processing capabilities divided between a client and a server? In other words, why not have the server do all the processing?**

Ans. To improve performance and availability of data, distributed processing allows geographically dispersed computers to cooperate when providing data access. Work can be balanced between a server and a client to efficiently process data access requests.

● **Q. 75.   In a client-server architecture, why are data sometimes stored on several computers rather than on a single computer?**

Ans. Because data can be stored in different locations for management and security, data are sometimes stored on several computers rather than on a single computer.

● **Q. 76.   What is the purpose of the mappings in the Three Schema Architecture? Is the user or the DBMS responsible for using the mappings ?**

Ans. The purpose of the mappings in the Three Schema Architecture is to describe how a schema at a higher level is derived from a schema at a lower level. The DBMS, not the user, is responsible for using the mappings.

● **Q. 77.   Explain how the Three Schema Architecture supports data independence?**

Ans. The three Schema Architecture is a standard that serves as a guideline about how data independence can be achieved. The spirit of the Three Schema Architecture is widely implemented in third-and fourth-generation DBMS. In the Three Schema Architecture, the DBMS uses schemas and mappings to ensure data independence. Typically, applications access

a database using a view. The DBMS converts an application's request into a request using the conceptual schema rather than the view. The DBMS then transforms the conceptual schema request into a request using the internal schema. Most changes to the conceptual or internal schema do not affect applications because applications do not use the lower schema levels.

● **Q. 78. What's the difference between a primary key and a unique key?**
Ans. Both primary key and unique enforce uniqueness of the column of which they are defined. But by default primary key creates a clustered index on the column, where as unique creates a nonclustered index by default. Another major difference is that, primary key doesn't allow NULLs, but unique key allows NULL.

● **Q. 79. How to implement one-to-one, one-to-many and many-to-many relationships while designing tables?**
Ans.
 • One-to-One relationship can be implemented as a single table and rarely as two tables with primary and foreign key relationships.
 • One-to-Many relationships are implemented by splitting the data into two tables with primary key and foreign key relationships.
 • Many-to-Many relationships are implemented using a junction table with the keys from both the tables forming the composite primary key of the junction table.

● **Q. 80. What is difference detween DELETE and TRUNCATE commands?**
Ans. Delete command removes the rows from a table based on the condition that we provide with a WHERE clause. Truncate will actually remove all the rows from a table and there will be no data in the table after we run the truncate command.

TRUNCATE
 • TRUNCATE is faster and uses fewer system and transaction log resources than DELETE.
 • TRUNCATE removes the data by deallocating the data pages used to store the table's data, and only the page deallocations are recorded in the transaction log.
 • TRUNCATE removes all rows from a table, but the table structure and its columns,
 . constraints, indexes and so on remain. The counter used by an identity for new rows is reset to the seed for the column.
 • You cannot use TRUNCATE TABLE on a table referenced by a FOREIGN KEY constraint. Because TRUNCATE TABLE is not logged, it cannot activate a trigger.
 • TRUNCATE can not be Rolled back.
 • TRUNCATE is DDL Command.
 • TRUNCATE resets identity of the table.

DELETE
 • DELETE remove rows one at a time and records an entry in the transation log for each deleted row. If you want to retain the identity counter, use DELETE instead. If you want to remove table definition and its data, use the DROP TABLE statement.
 • DELETE can be used with or without a WHERE clause
 • DELETE Activates Triggers.
 • DELETE can be rolled back.
 • DELETE is DML Command.
 • DELETE   does to reset identity of the table.

● **Q. 81.   When is the use of UPDATE_STATISTICS command?**

Ans. This command is basically used when a large processing of data has occurred. If a large amount of deletions, any modification or Bulk Copy into the tables has occurred, it has to update the indexes to take these changes into account. UPDATE_STATISTICS updates the indexes on these table accordingly.

● **Q. 82.   What types of joins are possible with SQL Server?**

Ans. Joins are used in queries to explain how different tables are related. Joins also let you select data from a table depending upon data from another table.

Types   of Joins : INNER JOINs, OUTER JOINs, NATURAL JOINs, OUTER JOINs are further classified as LEFT OUTER JOINS, RIGHT OUTER JOINS and FULL OUTER JOINS

● **Q. 83.   What is the difference between a HAVING CLAUSE and a WHERE CLAUSE?**

Ans. Specifies a search condition for a group or an aggregate. Having can be used only with the SELECT statement. HAVING is typically used in a GROUP BY clause. When GROUP BY is not used, HAVING behaves like a WHERE clause. Having clause is basically used only with the GROUP BY function in a query. WHERE Clause is applied to each row before they are part of the GROUP BY function in a query.

● **Q. 84.   What is sub-query? Explain properties of sub-query.**

Ans. Sub-queries are often referred to as sub-selects, as they allow a SELECT statement to be executed arbitrarily within the body of another SQL statement. A sub-query is executed by enclosing it in a set of parentheses. Sub-queries are generally used to return a single row as an atomic value, though they may be used to compare values against multiple rows with the IN keyword.

A sub query is a SELECT statement that is nested within another T-SQL statement. A sub query SELECT statement if executed independently of the T-SQL statement, in which it is nested, will return a result set. Meaning a sub query SELECT statement can standalone and is not depended on the statement in which it is nested. A sub query SELECT statement can return any number of values, and can be found in the column list of a SELECT statement, a FROM, GROUP BY, HAVING, and or ORDER BY clauses of a T-SQ statement. A Sub query anywhere an expression can be used.

Properties of Sub-Query

• A sub query must be enclosed in the parenthesis.

• A sub query must be put in the right hand of the comparison operator, and

• A sub query cannot contain an ORDER-BY clause.

• A query can contain more than one sub-queries.

● **Q. 85.   What are types of sub-queries?**

Ans. Single-row sub query, where the sub query returns only one row.

Multiple-row sub query, where the sub query returns multiple rows, and

Multiple column sub query, where the sub query returns multiple columns.

● **Q. 86.   What is log shipping?**

Ans. Log shipping is the process of automating the backup of database and transaction log files on a production SQL server, and then restoring them onto a standby server. Enterprise Editions only supports log shipping. In log shipping the transactional log file from one server is automatically updated into the backup database on the other server.

If one server fails, the other server will have the same database can be used this as the Disaster

Recovery plan. The key feature of log shipping is that is will automatically backup transaction logs throughout the day and automatically restore them on the standby server at defined interval.

- **Q. 87. What is the difference between a local and a global variable?**
  Ans. A **local temporary** table exists only for the duration of a connection or, if defined inside a compound statement, for the duration of the compound statement.
  A global temporary table remains in the database permanently, but the rows exist only within a given connection. When connection are closed, the data in the global temporary table disappears. However, the table definition remains with the database for access when database is opened next time.

- **Q. 88. What are the properties of the Relational tables?**
  Ans. Relation tables have six properties :
  - Values are atomic.
  - Column values are of the same kind.
  - Each row is unique,
  - The sequence of columns is insignificant.
  - Each column must have a unique name.

- **Q. 89. What is De-normalization?**
  Ans. De-normalization is the process of attempting to optimize the performance of a database by adding redundant data. If is sometimes necessary because current DBMSs implement the relational model poorly. A true relational DBMS would allow for a fully normalized database at the logical level, while providing physical storage of data that is turned for high performance. De-normalization is a technique to move from higher to lower normal forms of database modeling in order to speed up database access.

- **Q. 90. What is the difference between clustered and a non-clustered index?**
  Ans. A clustered index is a special type of index that reorders the way records in the table are physically stored. Therefore table can have only one clustered index. The leaf nodes of a clustered index contain the data pages.
  A non clustered index is a special type of index in which the logical order of the index does not match the physical stored order of the rows on disk. The leaf node of a non clustered index does not consist of the data pages. Instead, the leaf nodes contain index rows.

- **Q. 91. What are the different index configurations a table can have?**
  Ans. A table can have one of the following index configurations :
  - No indexes
  - A clustered index
  - A clustered index and many non clustered indexes
  - A non clustered index
  - Many non clustered indexes

- **Q. 92. Why would you choose a database system instead of simply storing data in operating system files? When would it make sense *not* to use a database system?**
  Ans. A *database* is an integrated collection of data usually so large that is has to be stored on secondary storage devices such as disks or tapes. This data can be maintained as a collection of operating system files, or stored in a *DBMS* (database management system).
  The advantages of using a DBMS are :
  - *Data independence and efficient access.* Database application programs are independent of the

details of data representation and storage. The conceptual and external schemas provide independence from physical storage decisions and logical design decisions respectively. In addition, a DBMS provides efficient storage retrieval mechanisms, including support for very large files, index structures and query optimization.

- *Reduced application developement time.* Since, the DBMS provides several important functions required by application, such as concurrency control and crash recovery, high level query facilities, etc., only application-specific code need to be written. Even this is facilitated by suites of application development tools available from vendors for many database management systems.

- *Data integrity and security.* The view mechanism and the authorization facilities of a DBMS provide a powerful access control mechanism. Further, updata to the data that violate the semantics of the data can be detected and rejected by the DBMS if users specify the appropriate *integrity constraints.*

- *Data administration.* By providing a common umbrella for a large collection of data that is shared by several users, a DBMS facilitates maintenance and data administration tasks. A good DBA can effectively shield end-users from the chores of fine-tuning the data representation, periodic back-ups etc.

- *Concurrent access and crash recovery* A DBMS supports the notion of a *transaction,* which is conceptually a single user's sequential program. Users can write transactions as if their programs were running in isolation against the database. The DBMS executes the actions of transactions in an interleaved fashion to optain good performance, but schedules them in such a way as to ensure that conflicting operations are not permitted to proceed concurrently. Further, the DBMS maintains a continuous log of the changes to the data, and if there is a system crash, it can restore the database to a *transaction-consistent* state. That is, the actions of in complete transactions are undone, so that the database state reflects only the actions of completed transactions. Thus, if each complete transaction, executing alone, maintains the consistency criteria, then the database state after recovery from a crash is consistent.

If these advantages are not important for the application at hand, using a collections of files may be a better solution because of the increased cost and overhead of purchasing and maintaining a DBMS.

- **Q. 93.   Explain the difference logical and physical data independence.**
  Ans. Logical data independence means that users are shielded from changes in the logical structure of the data, while physical data independence insulate users from changes in the physical strong of the data.

- **Q. 94.   What are the reponsibilities of a DBA? If we assume that the DBA is never interested in running his or her own queries, does the DBA still need to understand query optimization? Why?**
  Ans. The DBA is responsible for :
  - Designing the logical and physical schemas, as well as widely-used portions of the external schema.
  - Security and authorization
  - Data availability and recovery from failures.
  - Database tuning : The DBA is responsible for evolving the database, in particular the conceptual and physical schemas, to ensure adequate performance as user requirements change.

  A DBA needs to understand query optimization even if he/she is not interested in running his

or her own queries because some of these reponsibilities (database besign and tuning) are related to query optimization. Unless the DBA understands the performance needs of widely used queries, and how the DBMS will optimize and execute these queries, good design and tuning decisions cannot be made.

Question-Answer

1. Define Database?
2. What is a DBMS?
3. What is the need for database systems?
4. Define tuple?
5. What are the reponsibilities of DBA?
6. Define schema?
7. Define entity and give example?
8. What is meant by foreign key?
9. What are the difference between Unique Key and Primary Key?
10. Define meta data?
11. What are the disadvantages of database systems?
12. What is meant by weak entities? Give example
13. What is domian relational calculus?
14. Define QueryLanguage?
15. Define Data model?
16. What are the 3 levels of data abstraction?
17. What are the advantages of relational model?
18. Define relation and relationship set?
19. Define attribute. List its types?
20. What is meant by entity set?
21. What are the different types of data models?
22. What is the difference between candidate key and super key?
23. What is meant by relational model?
24. What are the components of storage manager?
25. What is the difference between composite and simple attributes?
26. Compare database systems and file systems.
27. Give the distinction between primary key, candidate key and super key.
28. What is derived attribute?
29. What is the difference between weak and strong entity set?
30. What is the difference between a procedural and non-procedural languages?

LONG QUESTION

1. What are the disadvantages of DBMS compare to file processing systems? Explain in detail?
2. Draw a system architecture of DBMS. Explain each component in detail.
3. Explain various types of data models in detail.
4. Compare network and hierarchical model. Explain with example?
5. What is meant by E-R model? Explain with *e.g.,*.
6. What are the various types of attributes? Explain each with example?
7. Write detail notes on relational algebra.
8. Explain domain and tuple relational calculus in detail.
9. What is the need of relational model? Explain each with example?
10. List the different types of database users with their roles.
11. What is the role of DBA in the DBMS?

VERY SHORT TYPE QUESTIONS

1. What is data?
2. Describe database?
3. What is database management system?
4. What is RDBMS?
5. Write full form of SQL?
6. Describe Relational model?
7. Write three views of three level architecture?
8. Explain Data models?
9. SQL is the combination of .... and ....
10. Define data dictionary?
11. Define the following terms : DDL and DML?
12. Define schema ?
13. Define schema instance?
14. What are the basic units of ER diagrams?
15. Describe primary key?
16. Describe foreign key?
17. Describe candidate key?
18. Explain data integrity?
19. Briefly describe entity integrity?
20. Briefly describe referential integrity?
21. Define weak entities?
22. Define relational database?
23. What is specialization?
24. What do you mean by identifier?
25. Define relational schema?
26. What do you mean by unary relation?
27. What are the function of selection and projection operation?
28. What is data abstraction?

30. Briefly describe the concept of metadata?
31. What do your mean by cardinality?
    (a) Tuple
    (b) Domain
32. Define the following terms :
    (a) Field
    (b) Record
33. What do you mean by information?
34. What is data redundancy?
35. Describe DCL?
36. Describe DDL?
37. Describe DML?
38. Various operations use in relational algebra.
39. Various operations use in relational calculas.
40. What are the various features of join operations?
41. What are various data types use in SQL?
42. Is SQL non procedural language?
43. Why tuples are used in relational model?
44. What is the other two name of attribute?
45. What is the function of update and delete command?
46. What do you mean by composite key?
47. What do you mean by dependent and independent entities?
48. What is an entity set?
49. Describe regular entities?
50. What do you mean by Hierarchical model?
51. What do you mean by key?
52. Write types of keys?
53. What do you mean by integrity constraints?
54. What do you mean by procedural DML?
55. What is query processing?
56. What is the function of parser in query processing?
57. What is file organisation?
58. What are direct files?
59. What do you mean by hashing?
60. What do you mean by transaction processing?
61. What do you mean by B-Tree?
62. Briefly describe file processing?
63. Briefly describe Data base processing?
64. Name all the models available for database system?
65. Write down the two difference between DBMS and RDBMS?
66. What is Normalization?
67. What do you mean by data dictionary?
68. Write down the four components of DBMS?

69. Write down the four components of DBMS environment?
70. Write down the full forms of CASE tools?
71. What is DOMAIN?
72. What is domain value?
73. Write different types of constraints?
74. What is the difference between numeric and float datatype in SQL?
75. What is Query optimization?
76. What are the two function of DB manager?
77. Different types of users?
78. Where we store data structure in DBMS?
79. Where we have to change in data when changes occur in data?
80. Briefly describe client server model?
81. What do you mean by null constraints?
82. What is metadata?
83. What are the basic units of E-R diagrams?
84. What do you mean by attribute?
85. What do you mean by SQL?
86. Describe distributed DBMS?
87. Briefly describe application programmers.
88. What do you mean by comparison operator?
89. Different types of select query?
90. Two comparison between Network and Relational model?
91. How does a view differ from a table?
92. Describe object oriented approach?
93. Why drop query is used?
94. Full form of BCNF?
95. What is the difference between 3NF and NCNF?
96. What is meant by functional dependency?
97. What is the need of normalization?
98. What do you mean by mapping operation?
99. What is the difference between procedural and non procedural query languages?
100. What do you mean by degree of relationship set?

SHORT TYPE QUESTIONS

1. What do you mean by cardinality? What are different kinds of cardinalities?
2. Define : (a) DDL, (b) DML
3. What is a primary key?
4. What are various Data types in SQL?
5. What is relation? Define the relational data model.
6. What do you mean by SQL? What are the characteristics of SQL?
7. What is the role of Database Administrator?
8. What do you mean Database and Database Management System?

9. What are problems with traditional file processing system?

10. What do you mean by Data processing?

11. What is meant by an entity, attributes, entity set and relationship?

12. How is E-R data model useful?

13. Define an attribute. What is a key attribute?

14. Define subtype and supertype entities?

15. Give example of following relationships :
   (i) Many-to-One
   (ii) One-to-One
   (iii) One-to-Many
   (iv) Many-to-Many

16. Define foreign key? How does it play a role in the join operation?

17. What do you mean by Mapping Operation?

18. What do you mean by redundancy? How this can be avoided?

19. What do you mean by Normalisation? Why this is useful?

20. What is the difference between Procedural DML and Non-Procedural DML?

21. What do you mean by instance and schema? Explain the difference between these.

22. What are the various components of a database system?

23. What is the role of three levels of Data Abstraction?

24. How is a many-to-many relationship mapped onto a table?

25. What do you mean by a key? Explain the difference between primary key and candidate key.

26. What is the difference between the strong entity set and weak entity set?

27. Give SQL statement which creates a STUDENT table consisting of following fields.

Name	CHAR (40)
Class	CHAR (6)
Marks	NUMBER (4)
Rank	CHAR (8)

28. What is a relation? What is the difference between a table and an attribute.

29. If R1 is a relation with 5 rows and R2 is a relation with 3 rows, how many rows will the Cartesian product of R1 and R2 have?

30. Which subdivision of SQL is used to put values in tables and which one to create tables

31. Why Data Control Language (DCL) is used? Explain.

32. Explain the type of relationship the following have :
   (iii) Student and ID card
   (iv) Customer and Bank
   (v) Student and Roll No
   (vi) Customer and Car

33. Differentiate between SQL commands DROP TABLE and DROP VIEW.

34. Is Data Dictionary an essential part of DBMS. Why?

35. What is meant by the term Query Processing? What are the various steps involved in this process?

36. What is the difference between WHERE and HAVING CLAUSE?

37. What is file organization? Explain Sequential-files and direct-Files?

38. Differentiate between First Normal form and Second Normal form.

39. What is a multivalued dependency? What kind of constraint does it specify?

40. Discuss the various type of join operations? Why are these join required.

41. List the operations of relational algebra and purpose of each.

42. What is the difference between tuple relational calculus and domain relation calculus?

43. SQL is called as non-procedural language. Explain?

44. What do you mean by attribute? Explain various type of attributes.

45. Define the following terms :
   (a) Tuple   (b) Domain
   (c) Relation   (d) Entity
   (e) Regular entities

46. What is the difference between select and project operation? Give example.

47. Explain the concept of metadata.

48. What is the need for Normalisation? Define Third Normal form.

49. Explain the term Distributed DBMS and Client-Server DBMS.

50. What do you mean by Hashing?

51. What is integrity?

52. What is ER Diagram? What are the symbols used in it? Explain with an example.

53. What is the need of the normalization? Explain the first three steps involved in the normalization.

54. List out all the Codd's rules.

55. What do you mean by the database abstraction? How many types are there?

56. Difference between file oriented approach and database.

57. Difference between Database systems and Knowledge base systems.

58. Explain the client server architechure in detail.

59. What is the architecture of the database. Explain with diagram.

60. What is DBA, what are DBA's functions?

61. Draw the ER diagram for the banking system.

62. What is query processing. Explain the various steps involved in it.

63. What is database management.

64. What is structured query language? How the DDL and DML are different? Explain.

65. What is the file system. Explain the sequential files and direct files.

66. What are the drawbacks of the file systems. Explain in detail.

67. What is the data redundancy? How to remove the data redundancy? Explain it.

LONG TYPE QUESTIONS

1. What are various components of Database System? Explain in detail.

2. What do your mean by data models? Explain network, hierarchial and relational model in detail.

3. Explain various level of Data abstraction in database system?

4. What do you mean by database? What is the purpose of a databas system? Explain.

5. What do you mean by DBMS? Explain its functioning.

6. Explain architecture of DBMS and its advantages? State two main disadvantages of DBMS?

7. What is DBA? What are major responsibilities of DBA and database designers?
8. What are problems with traditional file processing system? How they are removed in database system? Explain
9. What do you mean by Entity-Relationship Diagram? Explain
10. Explain the various terms of an E-R model and how are they represented in an E-R model?
11. What is meant by term relationship between entities? Explain the different types of relationships that can exists with example.
12. Explain the concept of dependent entities? Give example.
13. What do you mean by mapping cardinalities? Explain various type of cardinalities.
14. What is difference between total and partial participation? Explain.
15. What is the difference b/w single and mulitvalued attributes?
16. Explain the concept of participation constraints?
17. Discuss the various update operation on relation and types of integrity constraints that must be checked for each update operation?
18. Discuss the various types of join operations? Why are these join require?
19. What do you mean by normalization? Explain.
20. What do you mean by BCNF? Why it is used and how it differ from 3 NF?
21. Describe the three-level architecture of DBMS? Also explain its importance in a database environment.
22. Discuss concept of database language and interfaces.
23. Give the various advantages and disadvantages of the network model. How it differ from relational model?
24. What is relationship? What are various types of relationship? Explain with example.
25. Explain the Codd's Rule in detail.
26. What do you mean by RDBMS? What are its characteristics?
27. Explain Entity integrity and Referential integrity in detail.
28. What is the difference between DBMS and RDBMS? Which of them is more suitable?
29. What is relational algebra? Discuss the various operations of relational algebra.
30. Describe the different types of relational calculus in detail.
31. What is relational calculus? Differentiate relational algebra and relational calculus.
32. What do you mean by Null values? Explain with suitable examples.
33. Why normalization needed? What are its disadvantages?
34. Discuss the various normal form in normalizaion with suitable examples.
35. Define term anomalies. Explain BCNF in detail
36. Why is concurrency control needed?
37. What is a deadlock? How can a deadlock occur? explain.
38. Briefly explain one deadlock prevention algorithm.
39. What if times tamping is used? Explain briefly
40. What is two-phase locking and how does it guarantee serializability?
41. Dicuss the concurrency control mechanism in detail using suitable example.
42. Differentiate between two phase locking and rigorous two-phase locking.
43. How can deadlocks be avoided when using 2pL?
44. How share and exclusive locks differ? Explain.

45. How precedence graph can be used to detect deadlock?

46. What is a system log? What is the purpose of the system log in system recovery?

47. What do you understand by distributed databases? Give the various advantages and disadvantages of distributed database management system.

48. Explain the architecture of Client-Server database in detail.

49. What are the main difference between a parallel and a distributed system? Explain.

50. Discuss the concept of Query Processing. What is a parser? Why is it used?

51. What is Query optimization? What are different techniques used in it.

DBMS QUESTION BANK

1. Write the difference between Database systems Vs File system

2. Explain View of Data.

3. Define the following terms :
   (a) Instances
   (b) Schemas
   (c) Logical schema
   (d) Physical schema

4. Explain Briefly about Data Models :
   (a) E-R model
   (b) Relational Model
   (c) Object-Oriented Model

5. Explain Database languages

6. Explain Database Users and Administrators

7. Explain Transaction Management.

8. Briefly explain Database system Structure

9. Explain Entity sets and Relationship Sets.

10. Explain Attributes and its types with examples.

11. Explain Constraints and its types with examples

12. Explain Mapping Cardinalities with example.

13. Define keys and its types with examples.

14. Explain Overall logical structure of E-R Diagram.

15. Explain Symbol used in the E-R notation.

16. Define UML and symbols used in UML notations.

17. Explain Relational Algebra and explain all its Fundamental operations with examples.

18. Explain Composition Operations in Relational Algebra.

19. Explain Formal Definition of the Relational Algebra.

20. Explain Views with examples.

21. Explain Tuple Relational Calculus with all operations. Explain Difference between Tuple Relational Calculus with Relational Algebra.

22. Explain Domain Relational Calculus with example. And state the difference between this and Tuple relational calculus.

23. What is Join and its types with example queries.

24. What is embedded-SQL with example.

25. Explain Assertion with examples.
26. Explain Cursor and its types with examples.
27. Explain Security and its Violations with examples.
28. Define 2 NF with examples.
29. Define Domain constraints?
30. Explain Referential Integrity constraints with example?
31. Is Database Modification Violates Referential integrity?
32. Define Assertions with example?
33. Explain Triggers with examples
34. Explain Triggers in SQL? And its types with examples.
35. Explain when not to use Triggers?
36. Explain Security Violations with examples.
37. Explain Authorizations?
38. Explain Granting of Privileges?
39. Define Audit trail with example.
40. Explain Authorization in SQL?
41. Explain First Normal Form with example? (*)
42. Explain Functional dependency and full-functional dependency? (*)
43. Explain Decomposition and its properties? (*)
44. Explain Boyce-codd normal form with example? (*)
45. Explain Third normal form with example? (*)
46. Explain Fourth normal with example? (*)
47. State the difference between Boyce-codd normal form and third normal form?
48. Explain Extraneous attributes?
49. Explain referential integrity, DB modification with on delete cascade and on update
50. Explain Triggers and its types with examples.
51. Explain Autorization is SQL with examples.
52. Explain Functional dependency and Trivial functional dependency with examples.
53. Explain Fourth normal forms with examples.
54. Expain Closure of Set of Functional dependency and Closure of Attribute sets
55. Explain Canonical cover and Extraneous Attributes with examples.
56. Explain BCNF with examples and also state the difference between this form 3NF.