Chapter – 7: LIST MANIPULATION

MCQ

1. What is the correct way to create a list in Python?

a) list = {1, 2, 3, 4}
b) list = [1, 2, 3, 4]
c) list = (1, 2, 3, 4)
d) list = <1, 2, 3, 4>

Answer: b) list = [1, 2, 3, 4]

2. Which method is used to add an element to the end of a list?

a) insert()
b) append()
c) extend()
d) add()

Answer: b) append()

3. What will be the output of the following code?

python

Copy code

```
list1 = [10, 20, 30, 40]
print(list1[2])
```

a) 20
b) 30
c) 40
d) IndexError

Answer: b) 30

4. Which of the following methods is used to remove an element by its value in a list?

a) pop()
b) remove()
c) del
d) clear()

Answer: b) remove()

Very Short answer Type Questions

Q.1 What do you understand by mutability?

Ans: Mutable means changeable. In Python, mutable types are those whose values can be changed in place. Only three types are mutable in python – Lists, Dictionaries and Sets.

Q.2 Start with the list[8,9,10]. Do the following using list functions

(a) Set the second entry (index 1) to 17

(b) Add 4, 5 and 6 to the end of the list.

(c) Remove the first entry from the list.

(d) Sort the list.

(e) Double the list.

(f) Insert 25 at index 3

Ans: (a) list[1]=17 (b) list.append(4) list.append(5) list.append(6)

(c) list.pop(0)

(d) list.sort()

(e) list=list*2

(f) list.insert(3,25)

Q.3 If a is [1, 2, 3], what is the difference (if any) between a*3 and [a, a, a]?

Ans: a*3 will produce [1,2,3,1,2,3,1,2,3], means a list of integers and

[a, a, a] will produce [[1,2,3],[1,2,3],[1,2,3]], means list of lists

Q.4 If a is [1, 2, 3], is a *3 equivalent to a + a + a?

Ans: Yes, Both a*3 and a+a+a will produce same result.

```
>>> a=[1,2,3]
>>> a*3
[1, 2, 3, 1, 2, 3, 1, 2, 3]
>>> a+a+a
[1, 2, 3, 1, 2, 3, 1, 2, 3]
```

Q.5 If a is [1, 2, 3], what is the meaning of a [1:1] = 9?

Ans: This will generate an error "TypeError: can only assign an iterable".

Q.6 If a is [1, 2, 3], what is the meaning of a [1:2] = 4 and a [1:1] = 4?

Ans: These will generate an error "TypeError: can only assign an iterable".

Q.7 What are list slices?

Ans: List slices are the sub-part of a list extracted out. You can use indexes of the list elements to create *list slices* as per following format. Syntax is as follows –

Seq=ListName[start:stop]

Q.8 Does a slice operator always produce a new list?

Ans: Yes, this will create a new list.

Short Answer Type Questions

Q.1 How are lists different from strings when both are sequences?

Ans: Lists are similar to strings in many ways like indexing, slicing, and accessing individual elements but they are different in the sense that

(i) *Lists are mutable while strings are immutable*.

(ii) *In consecutive locations, strings store the individual characters while list stores the references of its elements.*

(iii) *Strings store single type of elements-all characters while lists can store elements belonging to different types.*

Q.2 What are nested Lists?

Ans: A list can have an element in it, which itself is a list. Such a list is called nested list. e.g.

L = [1,2,3,4,[5,6,7],8]

Q.3 Discuss the utility and significance of Lists.

Ans: The list is a most versatile datatype available in Python which can be written as a list of commaseparated values (items) between square brackets. Important thing about a list is that items in a list need not be of the same type. List is majorly used with dictionaries when there is large number of data.

Q.4 What is the purpose of the del operator and pop method? Try deleting a slice.

Ans: ***del operator*** is used to remove an individual item, or to remove all items identified by a slice. It is to be used as per syntax given below –

>>>del List[index]

>>>del List[start:stop]

pop method is used to remove single element, not list slices. The pop() method removes an individual item and returns it. Its syntax is –

>>>a=List.pop() #this will remove last item and deleted item will be assigned to a.

>>>a=List[10] # this will remove the ite at index 10 and deleted item will be assigned to a.

Q.5 What are list slices?

Ans: List slices, like string slices are the sub part of a list extracted out. Indexes can be used to create list slices as per following format:
seq = L[start:stop]

Q.6 What do you understand by true copy of a list? How is it different from shallow copy?

Ans: A **shallow copy** means constructing a new collection object and then populating it with references to the child objects found in the original. In essence, a shallow copy is only *one level deep*. The copying process does not recurse and therefore won"t create copies of the child objects themselves.

True Copy means you can create a copy of a list using *New_list=My_list.* The assignment just copies the reference to the list, not the actual list, so both new_list and my_list refer to the same list after the assignment.

Q.7 Predict the output –

Ans:

```
False
[9, 7, 5, 3, 1]
```

```
L1=[1,3,5,7,9]
print(L1==L1.reverse())
print(L1)
```

Q.8

```
List1=[13,18,11,16,13,18,13]
print(List1.index(18))
print(List1.count(18))
List1.append(List1.count(13))
print(List1)
```

Predict the output –

Ans:

```
1
2
[13, 18, 11, 16, 13, 18, 13, 3]
```

Skill Based Questions

Q.1 WAP to find minimum element from a list of elements along with its index in the list.

Ans:

```
L=[2,58,95,999,65,32,15,1,7,45]
print(L)
m=min(L)
print("The Minimum elements is : ",m)
print("Index of minimum element is : ",L.index(m))
```

Or

```
lst=eval(input("Enter List : "))
length=len(lst)
min_ele=lst[0]
min_index=0
for i in range(1,length-1):
    if lst[i]<min_ele:
        min_ele=lst[i]
        min_index=i
print("Given list is : ",lst)
print("The Minimum element of the list is : ")
print(min_ele," at index ",min_index)
```

output

```
Enter List : [67,87,56,6,4,89,99,3,2,56]
Given list is :  [67, 87, 56, 6, 4, 89, 99, 3, 2, 56]
The Minimum element of the list is :
2  at index  8
```

Q.2 WAP to search for an element in a given list of numbers.

Ans:

```
L=[2,58,95,999,65,32,15,1,7,45]
n=int(input("Enter the number to be searched : "))
found=0
for x in L:
    if x==n:
        print("Item found at position : ",L.index(n)+1)
        found=1
if found==0:
    print("Item not found")
```

Chapter – 8: DICTIONARIES

MCQ

1. How is a dictionary created in Python?

a) dict = [key1: value1, key2: value2]

b) dict = {key1: value1, key2: value2}

c) dict = (key1: value1, key2: value2)

d) dict = <key1: value1, key2: value2>

Answer: b) dict = {key1: value1, key2: value2}

2. Which method is used to access the value associated with a specific key in a dictionary?

a) get(key)

b) fetch(key)

c) retrieve(key)

d) value(key)

Answer: a) get(key)

3. What will be the output of the following code?

python

Copy code

```
my_dict = {"name": "Alice", "age": 25}
print(my_dict["name"])
```

a) "name"

b) Alice

c) 25

d) KeyError

Answer: b) Alice

4. Which of the following methods is used to delete a key-value pair from a dictionary?

a) delete()

b) remove()

c) pop()

d) discard()

Answer: c) pop()

5. What will be the output of the following code?

python

Copy code

```
my_dict = {"a": 1, "b": 2, "c": 3}
print("d" in my_dict)
```

a) True

b) False

c) "d"

d) KeyError

Answer: b) False

6. Which of the following statements is TRUE about dictionaries in Python?

a) Keys in a dictionary can be duplicated.

b) Dictionary values must be unique.

c) Dictionary keys are immutable.

d) Dictionaries are ordered in all Python versions.

Answer: c) Dictionary keys are immutable.

Very Short answer Type Questions

Q.1 Why can"t List can be used as keys?

Ans: List is mutable datatype. And Keys of dictionary must be immutable type. This is the region that list cannot be used as keys.

Q.2 What type of objects can be used as keys in dictionary?

Ans: Any immutable objects can be used as keys in dictionary.

Q.3 Can you change the order of the dictionaries contents?

Ans: Yes, the order of dictionary contents may be changed.

Q.4 Can you modify the keys in a dictionary?

Ans: Keys cannot be modified in dictionary while values are mutable in dictionary.

Q.5 Can you modify the value in a dictionary?

Ans: Yes, Values can be modified in dictionaries.

Q.6 Is dictionary Mutable? Why?

Ans: Dictionary is mutable type because we can change its values.

Short Answer Type Questioemns

Q.1 How are dictionaries different from Lists?

Ans: The dictionary is similar to lists in the sense that it is also a collection of data-items but it is different from lists in the sense that lists are sequential collections(ordered) and dictionaries are non-sequential collections(unordered).

Elements in lists or tuples can be accessed by using indexes. But in dictionaries the values can be obtained using keys. By changing the sequence of key we can shuffle the order of elements of dictionary while this thing is not possible in list.

Q.2 When are dictionaries more useful than lists?

Ans: Dictionaries can be much more useful than lists when we wanted to store all our friends cellphone numbers. We could create a list of pairs,(name of friend, phone number), but once this list becomes long enough searching this list for a specific phone number will get-time consuming. Better would be if we could index the list by our friend"s name. This is precisely what a dictionary does.

Q.3 Discuss the utility and significance of Dictionaries.

Ans: Dictionaries can be much more useful than lists when we wanted to store all our friends cellphone numbers. We could create a list of pairs,(name of friend, phone number), but once this list becomes long enough searching this list for a specific phone number will get-time consuming.

Better would be if we could index the list by our friend"s name. This is precisely what a dictionary does.

Q.4 Why is a dictionary termed as an unordered collection of objects?

Ans: But in dictionaries the values can be obtained using keys. By changing the sequence of key we can shuffle the order of elements of dictionary while this thing is not possible in list. In dictionaries there is no index. It uses its keys as index which can be rearranged. That"s why a dictionary termed as an unordered collection of objects

Q.5 How is clear() function different from del <dict> Statement?

Ans: clear() removes all the elements of a dictionary and makes it empty dictionary while **del** statement removes the complete dictionary as an object. After del statement with a dictionary name, that dictionary object no longer exists, not even empty dictionary. **Q.6 What is the output produced by the following code -**

```
d1={5:[6,7,8],"a":(1,2,3)}
print(d1.keys())
print(d1.values())
```

Ans:

```
dict_keys([5, 'a'])
dict_values([[6, 7, 8], (1, 2, 3)])
```

Skill Based Questions

Q.1 WAP that repeatedly asks the user to enter product names and prices. Store all of them in a dictionary whose keys are product names and values are prices. And also write a code to search an item from the dictionary.

Ans:

```
dict={}
ch='y'
while ch=='y' or ch=='Y':
    name=input("Enter name of product :")
    price=eval(input("Enter Price of product :"))
    dict[name]=price
    ch=input("Want to add more items (Y/N) : ")
print(dict)
nm=input("Enter the product you want to search :")
for x in dict:
    if x==nm:
        print("Product found and the price of product "\
              ,x," is ",dict[x])
```

```
Enter name of product :Pen
Enter Price of product :10
Want to add more items (Y/N) : y
Enter name of product :Pencil
Enter Price of product :5
Want to add more items (Y/N) : y
Enter name of product :Rubber
Enter Price of product :4
Want to add more items (Y/N) : y
Enter name of product :Cutter
Enter Price of product :4
Want to add more items (Y/N) : n
{'Pen': 10, 'Pencil': 5, 'Rubber': 4, 'Cutter': 4}
Enter the product you want to search :Rubber
Product found and the price of product  Rubber  is  4
```

Q.2 WAP to create a dictionary named year whose keys are month names and values are their corresponding number of days.

Ans:

```
dict={}
ch='y'
while ch=='y' or ch=='Y':
    month=input("Enter name of month :")
    days=eval(input("Enter no. of days of month :"))
    dict[month]=days
    ch=input("Want to add more months (Y/N) : ")
print(dict)
```

Chapter – 9: RELATIONAL DATABASES

1. Which of the following is an example of a Database Management System (DBMS)?

a) MS Word

b) MS Excel

c) MySQL

d) PowerPoint

Answer: c) MySQL

2. In a relational database, what is a "primary key"?

a) A column that uniquely identifies each row in a table

b) A column that allows duplicate values

c) A column used to sort the table

d) A column that connects two tables

Answer: a) A column that uniquely identifies each row in a table

3. Which SQL command is used to retrieve data from a database table?

a) INSERT

b) DELETE

c) SELECT

d) UPDATE

Answer: c) SELECT

4. What does "CRUD" stand for in database operations?

a) Create, Read, Update, Delete

b) Copy, Retrieve, Update, Delete

c) Create, Remove, Update, Data

d) Control, Retrieve, Update, Data

Answer: a) Create, Read, Update, Delete

5. What is the purpose of the WHERE clause in SQL?

a) To specify the table to query

b) To filter records based on conditions

c) To group data by a specific column

d) To define relationships between tables

Answer: b) To filter records based on conditions

6. Which of the following is NOT a type of database model?

a) Relational model

b) Hierarchical model

c) Network model

d) Spreadsheet model

Answer: d) Spreadsheet model

Short Answer Type Questions

Q.1 What is a database system? What is its need?

Ans: A database is a collection of information that is organized so that it can be easily accessed, managed and updated. Data is organized into rows, columns and tables, and it is indexed to make it easier to find relevant information. Data gets updated, expanded and deleted as new information is added. Databases process workloads to create and update themselves, querying the data they contain and running applications against it. The software which facilitates the collection of database and its retrieval is known as DBMS. A database along with a DBMS is referred to as a database system.

DBMS is needed to overcome the following problems in traditional file system –

(i) Data redundancy

(ii) Data inconsistency

(iii) Unstandardized data

(iv) Insecure data

(v) Incorrect data etc.

In DBMS these limitations has been almost reduced.

Q.2 What are the disadvantages of database systems?

Ans: When we work with complex task then there may be some disadvantages of using databases these are –

(i) Security may be compromised without good controls.

(ii) Integrity may be compromised without good controls.

(iii) Extra hardware may be required.

(iv) Performance overhead may be significant.

(v) System is likely to be complex.

Q.3 What are views? How they are useful?

Ans: A view is a virtual table that does not really exist in its own right but is instead derived from one or more underlying base tables(s). the view is a kind of table whose contents are taken opon other tables depending upon a given query condition. No stored file is created to store the contents of a view rather its definition is stored only.

The usefulness of views lies in the fact that they provide an excellent way to give people access to some but not all of the information in a table.

Q.4 What is the purpose of using MySQL?

Ans: MySQL is a free, open source *Relational Database Management System* (RDBMS) that uses Structured Query Language (SQL). In MySQL database, information is stored in *Tables.* A single MySQL database can contain many tables at once and store thousands of individual records.

Q.5 What do you understand by MySQL server instance?

Ans: MySQL server instance is created from background processes and applications.it stays in memory and listens for client requests coming in over the network amd accesses database contents according to those requests and provides that to the clients.

Q.6 What do you understand by MySQL client?

Ans: MySQL clients are programs that connect to the MySQL server and issue queries in a prespecified format. MySQL is compatible with the standards based SQL. The client program may contact the server programmatically or manually.

Q.7 What is SQL? What are different categories of commands available in SQL?

Ans: In order to access the data within Oracle databases, all programs and users must use, Structured Query Language (SQL). SQL is the set of commands that is recognized by nearly all RDBMSs. SQL commands can be divided into following categories –

(i) Data Definition Language (DDL) Commands.

(ii) Data Manipulation Language (DML) Commands.

(iii) Transaction Control Language (TCL) Commands.

(iv) Session Control Commands.

(v) System Control Commands.

Q.8 Differentiate between DDL and DML commands.

Ans: ***The DDL commands***, as the name suggests, allow you to perform tasks related to data definition i.e. through these commands you can perform tasks like create, alter and drop schema objects, grant and revoke privileges etc.

The DML commands, as the name suggests, are used to manipulate data i.e. DML commands query and manipulate data in existing schema objects like, Select query, insert into command etc.

Q.9 What is MySQL? What are its functions and features?

Ans: MySQL is a free, open source *Relational Database Management System* (RDBMS) that uses Structured Query Language (SQL). In MySQL database, information is stored in *Tables.* A single MySQL database can contain many tables at once and store thousands of individual records. Its functions and features are –

(i) Speed

(ii) Ease of use

(iii) Cost

(iv) Query Language support

(v) Portability

(vi) Data Types

(vii) Security

(viii) Scalability and Limits

(ix) Connectivity

(x) Localization

(xi) Clients and Tools

Q.10 Name some commands used to assign/revoke privileges from database users.

Ans: Grant Privilege Command and Revoke Privilege commands. **Q.11**

Name some Table maintenance commands?

Ans: ANALYZE TABLE , CHECK TABLE , CHECKSUM TABLE , OPTIMIZE TABLE , REPAIR TABLE

Chapter – 10: SIMPLE QUERIES IN SQL

Very Short Answer Type Questions

Q.1 Name some basic MySQL SQL elements.

Ans: Some basic MySQL SQL elements are : (i) Literals (ii) Datatypes (iii) Nulls (iv) Comments. **Q.2 Differentiate between CHAR and VARCHAR Datatypes.**

Ans: The difference between CHAR and VACHAR is that of *fixed length* and *variable length respectively.*

Q.3 Write two usage of DESC in SQL.

Ans: DESC is used with Order by Clause in select statement which displays the data in descending order. And another user of DESC is that it is used to display the structure of table.

Q.4 Consider the following Table named „empl" and Write SQL commands from (a) to (n)

empno	ename	job	mgr	hiredate	sal	comm	deptno
8369	SMITH	CLERK	8902	1990-12-18	800.00	NULL	20
8499	ANYA	SALESMAN	8698	1991-02-20	1600.00	300.00	30
8521	SETH	SALESMAN	8698	1991-02-22	1250.00	500.00	30
8566	MAHADEVAN	MANAGER	8839	1991-04-02	2985.00	NULL	20
8654	MOMIN	SALESMAN	8698	1991-09-28	1250.00	1400.00	30
8698	BINA	MANAGER	8839	1991-05-01	2850.00	NULL	30
8882	SHIAVNSH	MANAGER	8839	1991-06-09	2450.00	NULL	10
8888	SCOTT	ANALYST	8566	1992-12-09	3000.00	NULL	20
8839	AMIR	PRESIDENT	NULL	1991-11-18	5000.00	NULL	10
8844	KULDEEP	SALESMAN	8698	1991-09-08	1500.00	0.00	30
8886	ANOOP	CLERK	8888	1993-01-12	1100.00	NULL	20
8900	JATIN	CLERK	8698	1991-12-03	950.00	NULL	30
8902	FAKIR	ANALYST	8566	1991-12-03	3000.00	NULL	20
8934	MITA	CLERK	8882	1992-01-23	1300.00	NULL	10

(a) Display all the records from table empl.

Ans: select * from empl;

(b) Display EmpNo and EName of all employees from the table empl.

Ans: select EmpNo, EName from empl;

(c) Display employee name, salary, and department number who are not getting commission from table empl.

Ans: select EName, sal, deptno from empl where comm = NULL;

(d) Display employee number, name, sal*12 as Annual salary whose commission is not NULL from table empl.

Ans: select EmpNo, EName, sal*12 „Annual Salary" from empl where sal<>NULL; **(e) List all department numbers from table empl.**

Ans: select deptno from empl;

(f) List all unique department numbers from table empl.

Ans: select distinct(deptno) from empl;

(g) List the details of all clerks who have not been assigned department as yet.

Ans: select * from empl where job="CLERK" and deptno=NULL;

(h) Display the details of employees whose name have only four letters.

Ans: select * from empl where EName like „_ _ _ _“;

(i) Display the details of all employee whose annual salary is between 25000 to 40000.

Ans: select * from empl where sal between 25000 and 40000; **(j)**

How many job types are offered to employees?

Ans: select count(distinct(job)) from empl;

(k) List the employees who earn more commission than their salaries.

Ans: select * from emple where sal<comm;

(l) Display name, job title and salary of employee who do not have manager.

Ans: select EName, job, sal from empl where mgr = NULL;

(m) Display the name of employee whose name contains „A“ as third letter.

Ans: select EName from empl where EName like „_ _ A%“

(n) Display the name of employee whose name contains „L“ as any letter. Ans: select EName from empl where EName like „%L%“

Consider the above table „empl“ and give answer-

Q.5 Write a query to display EName and Sal of employee whose salary is greater than or equal to 2200 from table empl.

Ans: select EName, sal from empl where sal>=2200;

Q7 Write SQL commands for the following on the basis of given table STUDENT :

Table : STUDENT1

No.	Name	Stipend	Stream	AvgMark	Grade	Class
1	Karan	400.00	Medical	78.5	B	12B
2	Divakar	450.00	Commerce	89.2	A	11C
3	Divya	300.00	Commerce	68.6	C	12C
4	Arun	350.00	Humanities	73.1	B	12C
5	Sabina	500.00	Nonmedical	90.6	A	11A
6	John	400.00	Medical	75.4	B	12B
7	Robert	250.00	Humanities	64.4	C	11A
8	Rubina	450.00	Nonmedical	88.5	A	12A
9	Vikas	500.00	Nonmedical	92.0	A	12A
10	Mohan	300.00	Commerce	67.5	C	12C

Ans: (a) select * from STUDENT1 where Stream = „NONMEDICAL“;

(b) select Name from STUDENT1 where CLASS like „12_“ order by Stipend;

(c) select * from STUDENT1 order by AvgMark desc;

select Name, Stipend, Stream, Stipend*12 „Stipend in a Year“ from STUDENT1;

Q.6 Write SQL commands for the following on the basis of given table CLUB :

Table : CLUB

COACH_ID	COACHNAME	AGE	SPORTS	DATOFAPP	PAY	SEX
1.	KUKREJA	35	KARATE	27/03/1996	1000	M
2.	RAVINA	34	KARATE	20/01/1998	1200	F
3.	KARAN	34	SQUASH	19/02/1998	2000	M
4.	TARUN	33	BASKETBALL	01/01/1998	1500	M
5.	ZUBIN	36	SWIMMING	12/01/1998	750	M
6.	KETAKI	36	SWIMMING	24/02/1998	800	F
7.	ANKITA	39	SQUASH	20/02/1998	2200	F
8.	ZAREEN	37	KARATE	22/02/1998	1100	F
9.	KUSH	41	SWIMMING	13/01/1998	900	M
10.	SHAILYA	37	BASKETBALL	19/02/1998	1700	M

(a) To show all information about the swimming coaches in the club.

(b) To list names of all coaches with their date of appointment (DATOFAPP) in descending order.

(c) To display a report, showing coachname, pay, age and bonus (15% of pay) for all the coaches.

Ans: (a) Select * from CLUB;

(a) Select COACHNAME, DATEOFAPP from CLUB order by DATEOFAPP desc;

(b) Select COACHNAME, PAY, AGE, PAY*15/100 „BONUS“ from CLUB;

TABLE CREATION AND DATA MANIPULATION COMMANDS

Short Answer Type Questions

Q.1 Using SQL statements in MySQL, create the tables identified bellow in the following order.
Database Name: Univ.
Create database if needed. (Underlined Columns depict primary key)

Campus **(CampusID, CampusName, Street, City, State, Pin, Phone, CampusDiscount)**

Position **(PositionID, Position, YearlyMembershipFee)**

Members **(MemberID, Lastname, FirstName, CampusAddress, CampusPhone, CampusID, PositionID, ContractDuration)**

Foreign Keys **CampusID → Campus(CampusID)**
PositionID →Position(PositionID)

Ans: mysql>CREATE DATABASE Univ;

mysql>USE Univ;

mysql>CREATE TABLE Campus(CampusID VARCHAR(5) PRIMARY KEY,
CampusName VARCHAR(20),
Street VARCHAR(20),

City VARCHAR(20),
State VARCHAR(15),
Pin INT(6),
Phone VARCHAR(13),
CampusDiscount INT(2));

mysql>CREATE TABLE Position (PositionID VARCHAR(4) PRIMARY KEY,
Position VARCHAR(10),
YearlyMemberShipFee INT(4));

mysql>CREATE TABLE Members (MemberID VARCHAR(5) PRIMARY KEY,
LastName VARCHAR(15),
FirstName VARCHAR(15),
CampuAddress VARCHAR(30),
CampusPhone VARCHAR(13),
CAMPUSID VARCHAR(5), Foreign key(CAMPUSID)REFERENCES Campus(CampusID),
PositionID VARCHAR(4), foreign key(PositionID) REFERENCES Position(PositionID),
ContractDuration INT(2));

Q.2 Write SQL commands to perform the following tasks –

(a) Create table Employee with the following structure:

Name of Column	**ID**	**First_Name**	**Last_Name**	**User_ID**	**Salary**
Type	**Number(4)**	**Varchar(30)**	**Varchar(30)**	**Varchar(10)**	**Number(9,2)**

Ensure the following specification in created table:

- **ID should be declared as Primary Key**
- **User_ID shold be unique**
- **Salary Must be greater than 5000**
- **First_Name and Lst_Name must not remain Blank**

Ans: mysql>CREATE TABLE Employee (ID int(4) PRIMARY KEY,
First_Name VARCHAR(30) NOT NULL,
Last_Name VARCHAR(30) NOT NULL,
User_ID VARCHAR(10) UNIQUE,
Salary decimal(9,2));

(b) Create another table Job with following specification:

Name of Column	***Type***
Job_ID	**Number(4)**
Job_des	**Varchar(30)**
Alloc_on	**Date**
Due_on	**Date**
Emp_id	**Number(4)**

Ensure the following specification in created table:

- **Job_ID should be declared as Primary Key**
- **Job_des, Alloc_on, Due_on cannot be left blank**

- **Emp_id is foreign key here that us related to ID column of earlier created table Employee.**

Ans: mysql>CREATE TABLE Job (Job_ID NUMBER(4) PRIMARY KEY,
Job_des VARCHAR(30) NOT NULL,
Alloc_on DATE NOT NULL,
Due_on DATE NOT NULL,
Emp_id NUMBER(4),foreign key(Emp_id) REFERENCES Employee(ID));

(a) Show the structure of the table employee.

Ans: mysql>DESC Employee;

(b) Show the structure of the table job.

Ans: mysql>DESC Job;

(c) Insert 10 records into the table employee as well as Job.

Ans: mysql> INSERT INTO Employee VALUES(1, „Amit", "Kumar", "E1001",20000);

Same remaining 9 values can be inserted into Employee Table.

mysql> INSERT INTO Job VALUES(1001, „Manager", "12-25-2016", "12-28-2017", 1); ***Same remaining 9 values can be inserted into Job Table.***

(d) For record with ID 4 update record with Last_Name, User_ID and Salary. Ans: mysql>UPDATE Employee SET Last_Name="Singh" WHERE ID=4; mysql>UPDATE Employee SET Salary=25000 WHERE ID=4; mysql>UPDATE Employee SET User_ID="E1004" WHERE ID=4; **(e) Make the changes permanent.**

Ans: mysql>COMMIT

(f) Modify the salary and increase it by 1000, for all who get salary less than 6000.

Ans: mysql>UPDATE Employee SET Salary = Salary+1000 WHERE Salary<6000;

(g) Add one new column in table Employee named „Phone".

Ans: mysql>ALTER TABLE Employee ADD(Phone VARCHAR(13));

(h)Provide the phone numbers to all the employees.

Ans: mysql>INSERT INTO Employee (Phone) VALUES(„+918888888888");

Same remaining 9 values can be inserted into Employee Table.

(i) Delete the Employee record having First_Name as Manish.

Ans: mysql>DELETE FROM Employee WHERE First_Name="Manish";

(j) Remove employee table permanently.

Ans: mysql>DROP TABLE Employee;

(k) Count the total records in the table employee.

Ans: mysql>SELECT Count(*) FROM Employee;

Q.3 What are the different divisions of SQL and commands? Give examples.

Ans: SQL commands can be divided into following categories –

(i) Data Definition Language (DDL) Commands. e.g. CREATE TABLE, ALTER TABLE, DROP TABLE etc.

(ii) Data Manipulation Language (DML) Commands. e.g. INSERT INTO, DELETE FROM, UPDATE, SELECT etc.

(iii) Transaction Control Language (TCL) Commands.e.g. ROLLBACK, COMMIT, SAVEPOINT etc.

Q.4 What is foreign key? How do you define a foreign key in your table?

Ans: A foreign key is a column or group of columns in a relational database table that provides a link between data in two tables. It acts as a cross-reference between tables because it references the primary key of another table, thereby establishing a link between them.

To define a foreign key in a table we have to use REFERENCES keyword as follows -

```
mysql>CREATE TABLE Job (Job_ID NUMBER(4) PRIMARY KEY,
                        Job_des VARCHAR(30) NOT NULL,
                        Alloc_on DATE NOT NULL,
                        Due_on DATE NOT NULL,
                        Emp_id NUMBER(4) REFERENCES Employee(ID));
```

In the above example Emp_id is a foreign key which references the ID field of table Employee.

Q.5 How foreign key command is different from Primary Key command?

Ans: A primary key is a special key in a relational database that acts as a unique identifier for each record meaning it uniquely identifies each row/record in a table and its value should be unique for each row of the table. A foreign key, on the other hand, is a field in one table that link two tables together. It refers to a column or a group of columns that uniquely identifies a row of another table or same table.

A primary key is a combination of UNIQUE and Not Null constraints so no duplicate values can be allowed to have in a primary key field in a relational database table. No two rows are allowed to carry duplicate values for a primary key attribute. Unlike a primary key, foreign key can contain duplicate values and a table in a relational database can contain more than foreign key.

Q.6 How is Foreign Key commands related to Primary Key?

Ans: A foreign key refers to a field or a collection of fields in a database record that uniquely identifies a key field of another database record in some other table. In simple terms, it establishes a link between records in two different tables in a database. It can be a column in a table that points to the primary key columns meaning a foreign key defined in a table refers to the primary key of some other table. References are crucial in relational databases to establish links between records which is essential for sorting databases. Foreign keys play an important role in relational database normalization especially when tables need to access other tables.

Q.7 How do you enforce business rules on a database?

Ans: We can enforce Business Rules in Relational Databases Using Constraints. Constraints are restrictions over a column. Or we can say that constraint is a check or condition applicable on a field or set of fields. These are of following types –

(i) Unique
(ii) Primary Key
(iii) Default
(iv) Check
(v) Foreign Key

Q.8 What are table constraints? What are column constraints? How these two are different?

Ans: Table constraints apply to groups of one or more columns whereas column constraints apply only to Individual column.

Q.9 What is default value? How do you define it? What is the default value of column for which no default value is defined?

Ans: A default value can be specified for a column using DEFAULT clause. When a user does not enter a value for the column (having default value), automatically the defined default value is inserted in the field. e.g.

```
mysql>CREATE TABLE Employee (ID NUMBER(4) PRIMARY KEY,
                             First_Name VARCHAR(30) NOT NULL,
                             Last_Name VARCHAR(30) NOT NULL,
                             User_ID VARCHAR(10) UNIQUE,
                             Salary NUMBER(9,2) DEFAULT 15000);
```

Q.10 Differentiate between -

(i) DROP TABLE, DROP DATABASE

(ii) DROP TABLE, DROP clause of ALTER TABLE.

Ans: (i) DROP TABLE will delete a table whereas DROP DATABASE will delete a complete database which will contain different tables. These are DDL commands.

Q.11 How will you enlist the name of tables in a database?

Ams: By using SHOW TABLES command. e.g.

```
mysql>SHOW TABLES;
```

Q.12 How to view the structures of the table made by you?

Ans: By using DESC <TableName> command. e.g.

```
mysql>DESC Employee;
```

Q.13 How to Drop Table and Databases?

Ans: By using DROP TABLE command. e.g.

```
mysql>DROP TABLE Employee;
```

chapter 11 emerging trends

Q1. What is Artificial Intelligence (AI), and why is it an emerging trend?
A: AI refers to machines simulating human intelligence, including learning and decision-making. It is an emerging trend because it drives automation, smart systems, and predictive analytics, revolutionizing industries like healthcare, education, and transportation.

Q2. What role does Big Data play in technology today?
A: Big Data involves analyzing vast datasets to uncover patterns and insights. It is crucial in fields like business, healthcare, and governance, helping make informed decisions and predictions.

Q3. Define Cloud Computing and its significance in modern technology.
A: Cloud Computing delivers computing services like storage and processing over the internet. It eliminates the need for physical hardware, enabling flexible, cost-effective, and scalable solutions for individuals and businesses.

Q4. How is IoT (Internet of Things) changing our daily lives?
A: IoT connects devices through the internet, allowing them to exchange data. It enhances convenience, like smart home systems, wearable health devices, and smart cities, making life more efficient and interconnected.

Q5. What is Data Visualization, and why is it important?
A: Data Visualization represents data graphically using charts or graphs. It simplifies complex datasets, making it easier to identify trends and insights for better decision-making.

Q6. How does cybersecurity address emerging threats?
A: Cybersecurity protects systems and data from unauthorized access or cyberattacks. It is essential to safeguard sensitive information in an era where digital transactions and online interactions are rapidly growing.

Q7. Explain the concept of Data Science and its applications.
A: Data Science involves analyzing structured and unstructured data to extract actionable insights. It is used in areas like recommendation systems, fraud detection, and personalized marketing.

Q8. Why is programming essential in understanding emerging technologies?
A: Programming enables the development of software and applications that power emerging technologies like AI, ML, and IoT. Learning languages like Python helps students solve real-world problems.

Q9. What is Machine Learning, and how does it differ from AI?
A: Machine Learning is a subset of AI where machines learn from data without explicit programming. While AI focuses on mimicking human intelligence, ML emphasizes self-improvement from experiences.

Q10. Why is ethical use of technology a growing concern?
A: With advancements like AI and Big Data, ethical issues like data privacy, algorithmic bias, and misuse arise. Responsible usage ensures technology benefits society without causing harm.

Mcq

1. Which of the following is NOT a characteristic of cloud computing?

a) On-demand self-service
b) Limited storage capacity
c) Resource pooling
d) Broad network access

Answer: b) Limited storage capacity

2. IoT stands for:

a) Internet of Technology
b) Interconnected Objects of Technology
c) Internet of Things
d) Information of Things

Answer: c) Internet of Things

3. What is the primary purpose of Big Data analytics?

a) Storing small amounts of structured data
b) Analyzing and extracting insights from massive datasets
c) Encrypting sensitive data
d) Creating interactive graphics

Answer: b) Analyzing and extracting insights from massive datasets

4. In Artificial Intelligence, the term "machine learning" refers to:

a) Machines capable of manufacturing products
b) Programming computers to act like humans
c) Systems that improve their performance with experience
d) Providing data storage solutions

Answer: c) Systems that improve their performance with experience

5. Which technology allows devices to communicate with each other directly over the internet?

a) Blockchain
b) IoT
c) Cloud Computing
d) Augmented Reality

Answer: b) IoT

6. Blockchain is primarily associated with which of the following?

a) Augmented reality
b) Cryptocurrency
c) Cloud computing
d) Internet of Things

Answer: b) Cryptocurrency

7. Virtual Reality (VR) differs from Augmented Reality (AR) because:

a) VR adds digital elements to the real world
b) VR replaces the real world with a simulated environment

c) AR uses 3D printing
d) AR requires a blockchain network

Answer: b) VR replaces the real world with a simulated environment

8. Which of the following is NOT a layer of cloud computing services?

a) IaaS (Infrastructure as a Service)
b) PaaS (Platform as a Service)
c) SaaS (Software as a Service)
d) DaaS (Database as a Service)

Answer: d) DaaS (Database as a Service)

9. What is the main advantage of using a chatbot?

a) Providing human-like conversations
b) Storing large volumes of data
c) Enhancing cloud storage capabilities
d) Creating multimedia content

Answer: a) Providing human-like conversations

10. In Big Data, the term "Volume" refers to:

a) The speed at which data is processed
b) The type of data being processed
c) The large size of datasets
d) The trustworthiness of data

Answer: c) The large size of datasets

Best of luck