SQL INTERVIEW QUESTIONS

1. EXPAND SQL?

ANS: STRUCTURED QUERY LANGUAGE

2. WHAT IS DATABASE? WHAT ARE BASIC OPERATIONS WE CAN PERFORM ON IT? WHAT IS IT UNIVERSALLY CALLED AS?

ANS: It is a place or a medium which is used to stored the data in a systematic or organized way. There are four basic operations performed on database.

   1. CREATE/ INSERT
   2. READ/ RETRIVE
   3. UPDATE/ MODIFY
   4. DELETE/ DROP

   These operations are universally known as CRUD operations.

3. EXPLAIN RDBMS ALONG WITH RULES OF E.F CODD.

ANS: It is a type of DBMS which is used to store the data in the form of tables.

- We use Structured Query Language to communicate with the database.
- Security and Authorization are the main features provided by RDBMS.

<u>RULES OF E. F. CODD:</u>

i. The data entered into the cell must be a single valued data. If ever we store multiple values in a single cell there is a possibility of data loss.

ii. The data can be stored in multiple tables and we can establish a connection between the tables with the help of “Key Attributes”.

iii. The data must be stored in the form of tables including the meta data. The meta data is stored in meta table which is automatically generated by the software.

iv. The data entered must be validated by

- Assigning data types
- Assigning constraints

4. NAME THE 5 TYPES IN DATATYPES.

ANS: The 5 data types are:

i. CHAR

ii. VARCHAR/ VARCHAR2

iii. NUMBER

iv. DATE

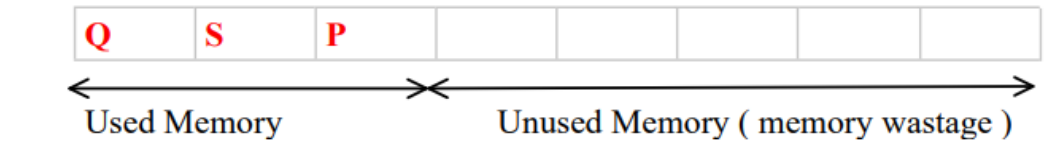
v. LARGE OBJECTS:

- CHARACTER LARGE OBJECTS
- BINARY LARGE OBJECTS

5. WHAT DOES CHAR FOLLOWS (PRINCIPLE) AND WHAT IS SIZE LIMIT OF CHAR? GIVE EXAMPLE.

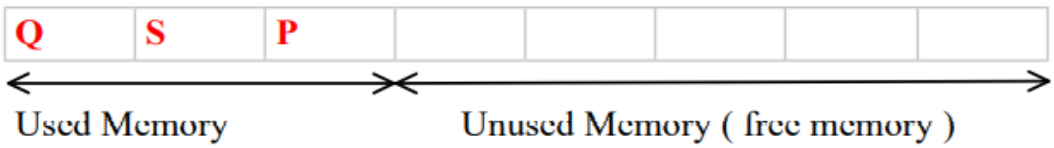
ANS: Char follows fixed length memory allocation. The maximum no of character it can store is 2000.

Example : CHAR (8)



6. WHAT DOES VARCHAR FOLLOWS (PRINCIPLE) AND WHAT IS THE SIZE LIMIT OF VARCHAR AND VARCHAR2? GIVE EXAMPLE.

ANS: Varchar follows variable length memory allocation. The maximum no of character varchar can store is 2000 and varchar2 can store is 4000.



7. WRITE THE SYNTAX OF NUMBER DATATYPE AND MENTION THE RANGE OF PRECISION AND SCALE? AMONG P & S WHICH IS MANDATORY AND DEFAULT VALUE FOR SCALE?

ANS: SYNTAX:

NUMBER(PRECISION[, SCALE])

The precision has a range from 1 to 38 and the scale has a range of 0 to p. Here precision is mandatory and the default scale value is 0.

8. WHAT IS ORACLE FORMAT FOR DATE DATATYPE?

ANS: ORACLE DATE FORMAT:

i. 'DD- MON- YY'

ii. 'DD-MON- YYYY'

9. WHAT IS THE SYNTAX OF CLOB AND BLOB?

ANS: Syntax for character large object is CLOB and binary large object is BLOB.

10. NAME ALL THE CONSTRAINTS.

ANS: There are 5 types of constraints.

i. UNIQUE

ii. NOT NULL

iii. CHECK

iv. PRIMARY KEY

v. FOREIGN KEY

11. CHARECTERISTICS OF NULL?

ANS: Null is a keyword which is used to represent Nothing / Empty Cell.

- Null doesn't represent 0 or Space.
- Any operations performed on a Null will result in Null itself.
- Null doesn't Occupy any Memory.
- We cannot Equate Null.

12. IS PRIMARY KEY OR FOREIGN KEY MANDOTORY? WRITE THE DIFFERENCE BETWEEN P.K AND F.K.

ANS: Neither Primary Key nor Foreign Key are important because constraints are not mandatory in the first place.

PRIMARY KEY	FOREIGN KEY
It is used to identify a records Uniquely from the table.	It is used to establish a connection Between the tables
It cannot accept Null	It can accept Null
It cannot accept duplicate values	It can accept duplicate values
It is always a combination of Not Null and Unique constraint	It is not a combination of Not Null and Unique constraint
We can have only 1 PK in a table	We can have Multiple FK in a table

13. UNDER HOW MANY LANGUAGES SQL STATEMENTS ARE CLASSIFIED? NAME THEM.

ANS: SQL statements are classified into 5 types.

i. Data Definition Language.

ii. Data Manipulation language.

iii. Transaction Control language.

iv. Data Control Language.

v. Data Query language.

14. WHAT ARE THE STATEMENTS COMES UNDER DDL? DML? TCL? DCL? DQL?

ANS:

i. DATA DEFINITION LANGUAGE (DDL):

It has 5 statements:

- CREATE
- RENAME
- ALTER

- TRUNCATE
- DROP

ii. DATA MANIPULATION LANGUAGE (DML):

It has 3 statements:

- INSERT
- UPDATE
- DELETE

iii. TRANSACTION CONTROL LANGUAGE (TCL):

It has 3 statements:

- COMMIT
- ROLLBACK
- SAVEPOINT

iv. DATA CONTROL LANGUAGE (DCL):

It has 2 statements:

- GRANT
- REVOKE

v. DATA QUERY LANGUAGE (DQL):

It has 4 statements:

- SELECT
- PROJECTION
- SELECTION
- JOIN

15. WRITE THE SYNTAX FOR CRAEATE STATEMENT AND ALTER STATEMENT.

ANS: <u>SYNTAX FOR CREATE:</u>

CREATE TABLE TABLE_NAME

(

COLUMN_NAME1 DATATYPE CONSTRAINTS,

COLUMN_NAME2 DATATYPE CONSTRAINTS,

COLUMN_NAME3 DATATYPE CONSTRAINTS,

.

.

COLUMN_NAMEn DATATYPE CONSTRAINTS

);

SYNTAX FOR ALTER:

➢ To add a column:

ALTER TABLE TABLE_NAME

ADD COLUMN_NAME DATATYPE CONSTRAINTS;

➢ To drop a column:

ALTER TABLE TABLE_NAME

DROP COLUMN COLUMN_NAME;

➢ To rename a column:

ALTER TABLE TABLE_NAME

RENAME COLUMN COLUMN_NAME TO NEW_COLUMN_NAME;

➢ To modify the datatype:

ALTER TABLE TABLE_NAME

MODIFY COLUMN_NAME NEW_DATATYPE;

➢ To modify null/ not null:

ALTER TABLE TABLE_NAME

MODIFY COLUMN_NAME EXISTING_DATATYPE NULL/NOT NULL;

16. WRITE THE DIFFERENCE BETWEEN TRUNCATE AND DELETE.

ANS: TRUNCATE: It is used to delete all the records from the table permanently.

DELETE: It is used to remove a particular record from the table.

17.WRITE THE DIFFERENCE BETWEEN FLASHBACK AND ROLLBACK.

ANS: FLASHBACK: It is used to recover the table back from the bin folder.

ROLLBACK: This statement is used to obtain only the saved data from the DB. It will bring you to the point where you have committed for the last time.

18.WHAT IS PROJECTION AND SELECTION? WRITE THE SYNTAX.

ANS:

PROJECTION: It is a process of retrieving the data by selecting only the columns.

SYNTAX:

```
SELECT */ [DISTINCT]COLUMN_NAME/ EXPRESSION[ALIAS]
FROM TABLE_NAME;
```

SELECTION: It is a process of retrieving the data by selecting both columns and records.

SYNTAX:

```
SELECT */ [DISTINCT]COLUMN_NAME/ EXPRESSION[ALIAS]
FROM TABLE_NAME
WHERE <FILTER_CONDITION>;
```

19.WRITE THE SYNTAX FOR ALL SPECIAL OPERATORS.

ANS:

a) IN: OPERAND IN (VAL1, VAL2, VAL3, ..., VALN)
b) NOT IN: OPERAND NOT IN (VAL1, VAL2, VAL3, ..., VALN)
c) BETWEEN: OPERAND BETWEEN LOWER_RANGE AND HIGHER_RANGE
d) NOT BETWEEN: OPERAND NOT BETWEEN LOWER_RANGE AND HIGHER_RANGE

e) IS: OPERAND IS NULL

f) IS NOT: OPERAND IS NOT NULL

g) LIKE: OPERAND LIKE ‘PATTERN TO MATCH’

h) NOT LIKE: OPERAND NOT LIKE ‘PATTERN TO MATCH’

20. NAME SOME SUBQUERY OPERATORS.

a) ALL

b) ANY

c) EXISTS

d) NOT EXISTS

21. NAME SOME SRF AND MRF.

➢ SINGLE ROW FUNCTIONS:

I. LENGTH( )

II. CONCAT( )

III. UPPER( )

IV. LOWER( )

V. INITCAP( )

VI. REVERSE( )

VII. SUSBTR( )

VIII. INSTR( )

IX. REPLACE( )

X. MOD( )

XI. TRUNC( )

XII. ROUND( )

XIII. MONTHS_BETWEEN( )

XIV. LAST_DAY()

XV. TO_CHAR()

XVI. NVL()

➢ MULTI ROW FUNCTIONS:

I. MAX()

II. MIN()

III. SUM()

IV. AVG()

V. COUNT()

22. WRITE THE RULES TO USE MRF.

ANS:

- Multi row functions can accept only one argument, i.e a Column_Name or an Expression.
- Along with a MRF( ) we are not supposed to use any other Column_Name in the select clause.
- MRF( ) ignore the Null.
- We cannot use a MRF( ) in where clause.
- COUNT( ) is the only MRF which can accept * as an Argument .

23. WRITE THE SYNTAX FOR ORDER BY CLAUSE ALONG WITH ORDER OF EXECUTION.

ANS: SYNTAX FOR ORDER BY:

SELECT GROUP_EXPRESSION/ GROUP_FUNCTION

FROM TABLE_NAME

[WHERE <FILTER_CONDITION>]

[GROUP BY COLUMN_NAME/ EXPRESSION]

[HAVING <GROUP_FILTER_CONDITION>]

ORDER BY COLUMN_NAME [ASC]/DESC;

ORDER OF EXECUTION:

I. FROM

II. WHERE

III. GROUP BY

IV. HAVING

V. SELECT

VI. ORDER BY

24. EXPLAIN SUB-QUERY. AND STATE WHEN AND WHY DO WE USE SUB-QUERY (STATE CASE-1 & CASE-2)

ANS: A QUERY WRITTEN INSIDE ANOTHER QUERY IS KNOWN AS SUB QUERY

Case 1: Whenever we have Unknowns present in the question, we use sub query to find the Unknown.

Case 2: Whenever the data to be selected and the condition to be executed are present in different tables we use Sub Query.

25. EXPALIN TYPES OF SUB-QUERY.

ANS: There are 2 types of sub query

I. SINGLE ROW SUB QUERY:
   - If the sub query returns exactly 1 record / value we call it as Single Row Sub Query.
   - If it returns only 1 value then we can use the normal operators Or the Special Operators to compare the values.

II. MULTI ROW SUB QUERY:
   - If the sub query returns more than1 record / value we call it as Multi Row Sub Query.
   - If it returns more than 1 value then we cannot use the normal operators We have to use only Special Operators to compare the values.

26. WHAT IS NESTED SUB-QUERY AND HOW MANY SUBQUERIES WE CAN NEST?

ANS: A sub query written inside a sub query is known as Nested Subquery. A sub query written inside a sub query is known as Nested Subquery.

27.NAME THE TYPES OF JOINS? AND EXPLAIN OUTER JOIN.

ANS: Types of joins:

1) CARTESIAN/ CROSS JOIN
2) INNER/ EQUI JOIN
3) OUTER JOIN
4) SELF JOIN
5) NATURAL JOIN

OUTER JOIN: There are 3 types of outer joins.

1) LEFT OUTER JOIN
2) RIGHT OUTER JOIN
3) FULL OUTER JOIN

- LEFT OUTER JOIN: It is used to obtain the unmatched records from the left table along with the matching records.

SYNTAX:

ANSI: (AMERICAN NATIONAL STANDARD INSTITUTE)

```
SELECT COLUMN_NAME
FROM TABLE_NAME1 LEFT OUTER JOIN TABLE_NAME2
ON <JOIN_CONDITION>;
```

ORACLE:

```
SELECT COLUMN_NAME
FROM TABLE_NAME1, TABLE_NAME2
WHERE TABLE_NAME1.COLUMN_NAME =
TABLE_NAME2.COLUMN_NAME (+);
```

- RIGHT OUTER JOIN: It is used to obtain the unmatched records from the right table along with the matching records.

  SYNTAX:

  ANSI:

  SELECT COLUMN_NAME

  FROM TABLE_NAME1 RIGHT OUTER JOIN TABLE_NAME2

  ON <JOIN_CONDITION>;

  ORACLE:

  SELECT COLUMN_NAME

  FROM TABLE_NAME1, TABLE_NAME2

  WHERE TABLE_NAME1.COLUMN_NAME (+) =
  TABLE_NAME2.COLUMN_NAME;

- FULL OUTER JOIN: It is used to obtain the unmatched records from both the tables along with the matching records.

  SYNTAX:

  ANSI:

  SELECT COLUMN_NAME

  FROM TABLE_NAME1 FULL OUTER JOIN TABLE_NAME2

  ON <JOIN_CONDITION>;

28. WHY/WHEN DO WE PERFORM SELF JOIN?

ANS: Whenever the data to selected is present in the same table but in different records then we use self join.

29. EXPLAIN CO-RELATED SUB-QUERY.

ANS: A query written inside another query such that the outer query and inner query are dependent on each other is known as Co-related subquery.

Let us consider two queries inner and outer query respectively,

1. Outer query executes first but partially.

2. The partially executed output is given as an input to the inner Query.

3. The inner query executes completely and generates an output The output of inner query is fed as an input to the Outer query and Outer.

4. Query produces the result. Therefore, we can state that the outer query and the inner query both are INTERDEPENDENT (dependent on each other).

5. In co-related sub query a Join condition is a must, and must be written only in the Inner Query.

6. Co-Related sub query works with the principles of both SUB QUERY & JOINS.

30. WRITE THE DIFFERENCE BETWEEN SUB-QUERY AND CO-RELATED SUB-QUERY.

ANS: SUB QUERY:

1. Inner query executes first.
2. Outer query is dependent on inner query.
3. Join condition not mandatory.
4. Outer query executes Once.

CO-RELATED SUB QUERY

1. Outer query executes first.
2. Both are interdependent.
3. Join condition is mandatory and must be written in inner query.
4. Outer query executes Twice.

31. WRITE THE SYNTAX TO FIND NTH MAXIMUM AND NTH MINIMUM SALARY. (BY USING CO-RELATED SUB-QUERY)

ANS: SYNTAX:

To find MAXIMUM salary:

```
SELECT SAL
FROM EMP E1
WHERE (SELECT COUNT(DISTINCT SAL)
        FROM EMP E2
        WHERE E1.SAL < E2.SAL) = N-1;
```

To find MINIMUM salary:

```
SELECT SAL
FROM EMP E1
WHERE (SELECT COUNT(DISTINCT SAL)
        FROM EMP E2
        WHERE E1.SAL > E2.SAL) = N-1;
```

32.

a) WHICH SRF IS USED TO OBTAIN NUMBER OF CHARACTERS PRESENT IN A GIVEN STRING?

ANS: LENGTH()

b) WHICH SRF IS USED TO OBTAIN THE POSITION OF A STRING?

ANS: INSTR()

c) WHICH SRF IS USED TO OBTAIN A PART STRING FROM THE GIVEN STRING?

ANS: SUBSTR()

d) WHICH SRF IS USED TO OBTAIN THE REMAINDER/MODULOUS.

ANS: MOD()

e) WHICH SRF IS USED TO REPLACE ANY STRING/CHARACTER WITH OTHER STRING/CHARECTER IN A GIVEN STRING?

ANS: REPLACE()

f) WHICH SRF IS USED TO AVOID THE SIDE EFFECTS OF NULL.

ANS: NVL()

g) WHICH SRF IS USED TO OBTAIN DATES BASED ON FORMAT MODELS.

ANS: TO_CHAR()

33. EXPALIN NORMALIZATION (WHAT? WHY? HOW?)

ANS: " It is the process of reducing a large table into smaller tables in order to remove redundancies and anomalies by identifying their functional dependencies is known as Normalization."

OR

"The process of decomposing a large table into smaller table is known as Normalization."

OR

"Reducing a table to its Normal Form is known as Normalization. "

34. WHAT IS REDUNDENCY AND ANOMALIES?

ANS:

REDUNDANCY: When the same data is stored in two or more separate places and is commonly occurred many times then we call it as redundancy.

ANOMALIES: It is a flaw in database because of poor planning and storing everything. Anomalies occur when there is too much redundancy in the database.

35. EXPALIN 1NF, 2NF AND 3NF.

ANS:

- FIRST NORMAL FORM (1NF):

  - No duplicate records.

- Multivalued data should not be present.

- SECOND NORMAL FORM (2NF):

  - Table should be in 1NF.

  - Table should not have Partial Functional Dependency.

- THIRD NOEMAL FORM (3NF):

  - Table should be in 2NF.

  - Table should not have Transitive Functional Dependency.

36. WHAT IS PARTIAL FUNCTIONAL DEPENDENCY?

ANS: If there exists a dependency such that all the attributes are dependent on a part of composite key attribute, then it is known as partial functional dependency.

37. WHAT IS TRANSITIVE FUNCTIONAL DEPENDENCY?

ANS: If there exists a relation such that two non key attributes define each other, then it is known as transitive functional dependency.

38. WRITE THE DIFFERENCE BETWEEN UNIQUE AND DISTINCT.

ANS: UNIQUE:

➢ It is a type of constraint.

➢ It does not allow duplicates or repeated value.

➢ It is given to the columns as a condition while creating the columns.

DISTINCT:

➢ It is a type of argument given in the select statement.

➢ It is used to remove the duplicates or repeated values from the columns mentioned.

➢ It will affect only the result table.

39. WHAT IS SUPER KEY ATTRIBUTE, COMPOSITE KEY ATTRIBUTE, KEY ATTRIBUTE / CANDIDATE KEY.

ANS:

- ➢ SUPER KEY ATTRIBUTE: The set of all the key attributes is known as Super key attribute.
- ➢ COMPOSITE KEY ATTRIBUTE: It is a combination of two or more non key attributes, which is used to identify the record uniquely from the table. Composite key attribute is found when there is no key attributes present in the table.
- ➢ KEY ATTRIBUTE: An attribute which is having the combination of unique and not null constraint is known as key attribute.

QUERIES:

1)WAQTD UNIQUE RECORDS OF EMPLOYEES NAME AND SALARY.

ANS:

```
SELECT DISTINCT ENAME, SAL
FROM EMP;
```

2)WAQTD DETAILS OF THE EMPLOYEES ALONG WITH THERE SALARY WITH A HIKE OF 25%. DISPLAY ONLY THOSE EMPLOYEE'S RECORDS WHOSE ANNUAL SALARY IS BETWEEN 10000 AND 20000.

ANS:

```
SELECT EMP.*, SAL+SAL*25/100
FROM EMP
WHERE SAL BETWEEN 10000 AND 20000;
```

3)WAQTD NAMES OF THE EMPLOYEES WHICH ARE REPEATED IN THE EMPLOYEE TABLE.

ANS:

```
SELECT ENAME
FROM EMP
GROUP BY ENAME
HAVING COUNT(*) > = 2;
```

4)WAQTD NUMBER OF EMPLOYEES WORKING IN EACH JOB AND IF THEIR MAXIMUM SALARY SHOULD EXEED 5000.

ANS:

```
SELECT JOB, COUNT(*)

FROM EMP

GROUP BY JOB

HAVING MAX(SAL) > 5000;
```

5)WAQTD NAMES OF THE EMPLOYEES WORKING IN EACH DEPARTMENT AS MANAGER.

ANS:

```
SELECT ENAME, DEPTNO

FROM EMP

WHERE JOB = 'MANAGER'

GROUP BY ENAME, DEPTNO;
```

6)WAQTD NAME, DESIGNATION AND SALARY OF THE EMPLOYEES IF THERE SALARY HAVE FOUR DIGITS WHICH ENDS WITH 5.

ANS:

```
SELECT ENAME, JOB, SAL

FROM EMP

WHERE SAL LIKE '___5'; (note 3 underscore and 5)
```

7)WAQTD DNAME AND LOC OF THE EMPLOYEE REPORTING TO SMITH'S MANAGER'S MANAGER.

ANS:

```
SELECT DNAME, LOC

FROM DEPT

WHERE DEPTNO IN (SELECT DEPTNO

                 FROM EMP
```

```
WHERE MGR = (SELECT MGR
             FROM EMP
             WHERE EMPNO = (SELECT MGR
                            FROM EMP
                            WHERE ENAME =
                          'SMITH')));
```

8)WAQTD NAMES, HIREDATE OF THE EMPLOYEES WHO WERE NOT HIRED IN THE YEAR 1982.

ANS:

```
SELECT ENAME, HIREDATE
FROM EMP
WHERE HIREDATE NOT LIKE '%82';
```

9)WAQTD EMPLOYEE DETAILS AND THEIR MANAGER'S DETAILS AND MANAGER'MANAGER'S NAME IF EMPLOYEE SAL IS LESS THAN MANAGER'S SALARY.

ANS:

```
SELECT E1.*, E2.*, E3.ENAME
FROM EMP E1, EMP E2, EMP E3
WHERE E1.MGR = E2.EMPNO AND E2.MGR = E3.EMPNO AND E1.SAL< E2.SAL;
```

10)WAQTD NAMES OF THE EMPLOYEES EARNING MAXIMUM SALARY.

ANS:

```
SELECT ENAME
FROM EMP
WHERE SAL = (SELECT MAX(SAL)
             FROM EMP);
```

11) WAQTD 1ST AND 5TH MINIMUM SALARIES OF THE EMPLOYEES.

ANS:

```
SELECT SAL
FROM EMP E1
WHERE (SELECT COUNT(DISTINCT SAL)
        FROM EMP E2
        WHERE E1.SAL > E2.SAL) IN (1,5);
```

12)WAQTD DNAMES OF THE EMPLOYEES EVEN THOUGH THERE WERE NO EMPLOYEES WORKING IN ANY DEPARTMENT.

ANS:

```
SELECT DNAME
FROM DEPT
WHERE EXISTS (SELECT DEPTNO
                FROM EMP
               WHERE DEPT.DEPTNO = EMP.DEPTNO);
```

13)WAQTD DNAMES IN WHICH EMPLOYEES WERE NOT WORKING.

ANS:

```
SELECT DNAME
FROM DEPT
WHERE NOT EXISTS (SELECT DEPTNO
                    FROM EMP
                    WHERE DEPT.DEPTNO = EMP.DEPTNO);
```

14)WAQTD NUMBER OF TIMES 'A' IS REPEATED IN EMPLOYEE'S NAME.

ANS:

```
SELECT LENGTH(ENAME) – LENGTH(REPLACE(ENAME, ‘A’))
FROM EMP;
```

15)WAQTD 1ST HALF AND 2ND HALF OF EMPLOYEES NAME.

ANS:

SELECT SUBSTR(ENAME, 1, LENGTH(ENAME)/2), SELECT SUBSTR(ENAME, (LENGTH(ENAME)/2)+1)

FROM EMP;

16)WAQTD NAMES OF THE EMPLOYEES CONTAINING STRING 'MA' ONLY ONCE IN THEIR DESIGNATION NAME.

SELECT ENAME

FROM EMP

WHERE INSTR (JOB, ‘MA’, 1, 1) != 0 AND INSTR(JOB, ‘MA’, 1, 2) = 0;

17)WAQTD NAMES OF THE EMPLOYEES WHOES EMPLOYEE NUMBER IS ODD NUMBER.

ANS:

SELECT ENAME

FROM EMP

WHERE MOD(ENAME, 2) = 1;

18)WAQTD DETAILS OF THE EMPLOYEES HIRED ON 'SUNDAY'.

ANS:

SELECT *

FROM EMP

WHERE TO_CHAR(HIREDATE, ‘DAY’) = ‘SUNDAY’;

19)WAQTD TOTAL SALARY OF THE EMPLOYEES (SAL+COMM).

ANS:

SELECT SAL + NVL(COMM, 0)

FROM EMP;

20)WAQTD NAMES, SALARY, JOB OF THE EMPLOYEES. AND THE RESULT SHOULD BE AS BELOW EXAMPLE"SMITH IS EARNING 2000 AS MANAGER."

ANS:

SELECT ENAME||’ IS EARNING ‘||SAL||’ AS ‘||JOB

```
FROM EMP;
```