## ****Complex SQL Queries Examples(90% ASKED IN Interviews)****

[**1.Query to find Second Highest Salary of Employee?(click for explaination)**](http://www.complexsql.com/query-to-find-second-highest-salary-of-employee/)

**Answer:**

**Select distinct Salary from Employee e1 where 2=Select count(distinct Salary) from Employee e2 where e1.salary<=e2.salary**;

Alternative Solution : Suggested by Ankit Srivastava

**select min(salary)from(select distinct salary from emp order by salary desc)where rownum<=2;**

[**2.Query to find duplicate rows in table?(click here for explaination )**](http://www.complexsql.com/query-to-find-duplicate-records-in-table/)

**Answer :**

**Select \* from Employee a where rowid <>( select max(rowid) from Employee b where a.Employee\_num=b.Employee\_num);**

[**3.How to fetch  monthly Salary of Employee if annual salary is given?(click here for Explaination)**](http://www.complexsql.com/query-find-monthly-salary-employee-annual-salary-given/)

**Answer:**

   Select Employee\_name,Salary/12 as ‘Monthly Salary’ from employee;

[Click here to get information on ROW\_ID](http://www.complexsql.com/rowid-rownum/)

**4.What is the Query to fetch first record from Employee table? (90% asked Complex SQL Queries Examples)**

**Answer:**

 Select \* from Employee where [Rownum](http://www.complexsql.com/rowid-rownum/)=1;

Select \* from Employee where Rowid= select min(Rowid) from Employee;

[Click here to get What is Rownum?](http://www.complexsql.com/rowid-rownum/)

**5.What is the Query to fetch last record from the table?**

**Answer:**

Select \* from Employee where Rowid= select max(Rowid) from Employee;

Complex SQL Queries

[Click here to get 20 interview questions on Perforance Tuning..](http://www.complexsql.com/sql-performance-indexing-in-sql-types-of-indexes-in-sql/)

**6.What is Query to display first 5 Records from Employee table?(90% asked Complex SQL Queries Examples)**

**Answer:**

Select \* from Employee where Rownum <= 5;

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[CLICK HERE TO GET INFORMATION ON NORMALIZATION](http://www.complexsql.com/database-normalization/)

**6.What is Query to display last 5 Records from Employee table?(90% asked Complex SQL Queries Examples)**

**Answer:**

Select \* from Employee e where rownum <=5

union

select \* from (Select \* from Employee e order by rowid desc) where rownum <=5;

[Click Here to get What is Union?](http://www.complexsql.com/sql-set-operatorsunionunion/)

**7.What is Query to display Nth Record from Employee table?**

**Answer :**

select \* from ( select a.\*, rownum rnum from ( YOUR\_QUERY\_GOES\_HERE — including the order by ) a where rownum <= N\_ROWS ) where rnum >= N\_ROWS

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**8.How to get 3 Highest salaries records from Employee table?**

**Answer:**

select distinct salary from employee a where 3 >= (select count(distinct salary) from employee b where a.salary <= b.salary) order by a.salary desc;

Alternative Solution: Suggested by Ankit Srivastava

select min(salary)from(select distinct salary from emp order by salary desc)where rownum<=3;

**9.How to Display**[**Odd[](https://www.complexsql.com/complex-sql-queries-examples-with-answers/#56367082)**](https://www.complexsql.com/complex-sql-queries-examples-with-answers/#56367082)**rows in Employee table?(90% asked Complex SQL Queries Examples)**

**Answer:**

Select \* from(Select rownum as rno,E.\* from Employee E) where Mod(rno,2)=1;

**10.How to Display Even rows in Employee table?**

**Answer:**

Select \* from(Select rownum as rno,E.\* from Employee) where Mod(rno,2)=0;

**11.How to fetch 3rd highest salary using Rank Function?**

**Answer:**

select \* from (Select Dense\_Rank() over ( order by  salary desc) as Rnk,E.\* from Employee E) where Rnk=3;

[Click Here to Get Information on Rank and Dense\_Rank](http://www.complexsql.com/rank-function-in-sql/)

**12.How Can i create table with same structure of Employee table?(90% asked Complex SQL Queries Examples)**

**Answer:**

Create table Employee\_1 as Select \* from Employee where 1=2;

**13.Display first 50% records from Employee table?**

**Answer:**

select rownum, e.\* from emp e where rownum<=(select count(\*)/2 from emp);

**14.Display last 50% records from Employee table?**

**Answer:**

Select rownum,E.\* from Employee E

minus

Select rownum,E.\* from Employee E where rownum<=(Select count(\*)/2) from Employee);

**15.How Can i create table with same structure with data of Employee table?**

**Answer:**

Create table Employee1 as select \* from Employee;

**16.How do i fetch only common records between 2 tables.**

**Answer:**

Select \* from Employee;

Intersect

Select \* from Employee1;

**17.Find Query to get information of Employee where Employee is not assigned to the department**

**Answer:**

Select \* from Employee where Dept\_no Not in(Select Department\_no from Department);

**18.How to get distinct records from the table without using distinct keyword.**

**Answer:**

select \* from Employee a where  rowid = (select max(rowid) from Employee b where  a.Employee\_no=b.Employee\_no);

**19.Select all records from Employee table whose name is ‘Amit’ and ‘Pradnya’**

**Answer:**

Select \* from Employee where Name in(‘Amit’,’Pradnya’);

**20.Select all records from Employee table where name not in ‘Amit’ and ‘Pradnya’**

**Answer:**

select \* from Employee where name Not  in (‘Amit’,’Pradnya’);

[Click Here to get  20 Interview Questions for Tech Mahindra….](http://www.complexsql.com/sql-interview-questions-for-tech-mahindra/)

**21.how to write sql query for the below scenario**  
**I/p:ORACLE**

**O/p:**  
**O  
R  
A  
C  
L  
E  
i.e, splitting into multiple columns a string using sql.**

**Answer:**

Select Substr(‘ORACLE’,Level,1) From Dual  
Connect By Level<= Length(‘ORACLE’);

**22.How to fetch all the records from Employee whose joining year is  2017?**

**Answer:**

Oracle:

select \* from Employee where To\_char(Joining\_date,’YYYY’)=’2017′;

MS SQL:

select \* from Employee where substr(convert(varchar,Joining\_date,103),7,4)=’2017′;

**23.What is SQL Query to find maximum salary of each department?**

**Answer:**

Select Dept\_id,max(salary) from Employee group by Dept\_id;

**24.How Do you find all Employees with its managers?(Consider there is manager id also in Employee table)**

**Answer:**

Select e.employee\_name,m.employee name from Employee e,Employee m where e.Employee\_id=m.Manager\_id;

**25.Display the name of employees who have joined in 2016 and salary is greater than 10000?**

**Answer:**

Select name from Employee where Hire\_Date like ‘2016%’ and salary>10000;

**26.How to display following using query?**

**\***

**\*\***

**\*\*\***

**Answer:**

We cannot use dual table to display output given above. To display output use any table. I am using Student table.

SELECT lpad (‘\*’, ROWNUM,’\*’) FROM Student WHERE ROWNUM <4;

**27.How to add the email validation using only one query?**

**Answer :**

User needs to use [REGEXP\_LIKE function](http://www.complexsql.com/regexp_like-examples/) for email validation.

 SELECT  
Email  
FROM  
Employee  
where NOT REGEXP\_LIKE(Email, ‘[A-Z0-9.\_%+-]+@[A-Z0-9.-]+\.[A-Z]{2,4}’, ‘i’);

**28.How to display 1 to 100 Numbers with query?**

**Answer:**

Select level from dual connect by level <=100;

**Tip:** User needs to know the concept of Hierarchical queries.[Click here to get concept of hierarchical queries](http://www.complexsql.com/hierarchical-queries/)

**29.How to remove duplicate rows from table?(100% asked in Complex SQL Queries for Interviews)**

**Answer:**

**First Step:**Selecting Duplicate rows from table

**Tip:**Use concept of max (rowid) of table. [Click here to get concept of rowid.](http://www.complexsql.com/rowid-rownum/)

Select rollno FROM Student WHERE ROWID <>

(Select max (rowid) from Student b where rollno=b.rollno);

**Step 2:**  Delete duplicate rows

Delete FROM Student WHERE ROWID <>

(Select max (rowid) from Student b where rollno=b.rollno);

**30.How to find count of duplicate rows? (95% asked in SQL queries for Interviews )**

**Answer:**

Select rollno, count (rollno) from Student

Group by rollno

Having count (rollno)>1

Order by count (rollno) desc;

**31.How to Find the Joining date of Employee in YYYY-DAY-Date format.**

Select FIRST\_NAME, to\_char(joining\_date,’YYYY’) JoinYear , to\_char(joining\_date,’Mon’), to\_char(joining\_date,’dd’) from EMPLOYEES;

Hope This article named Complex SQL queries examples is useful to all the programmers. This article gives you the idea about Complex SQL Queries examples and will be useful to all the programmers.

[Question 32 : How to convert the System time in to seconds in oracle?](https://www.complexsql.com/how-to-convert-time-to-seconds-in-oracle-with-examples/)

**Answer :**

To\_char function is used to convert time to character and ssss will used to convert the time in to seconds.

Following query is useful.

SQL> select

2 to\_char(sysdate,'hh24:mi:ss') As "SystemTime",

3 to\_char(sysdate,'sssss') "Seconds"

4 from dual;

SystemTime Seconds

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11:34:50 41750

## SQL Optimization interview questions:

**1.What are different parameters to consider the database performance of Application?**

**Answer:**

*There are lot of parameters to consider the performance of application:*

*1.What size of images we are using in application.The images we are using on application should not be maximum size.*

*2.What is the data volume used to fetch the data*

*3.Data cardinality: The most important factor is data cardinality of the data in application.Data should be divided in proper manner and the database should be in well normalized form*

*4.Indexing done:Indexing should be done properly in database*[*(Click here for index info)*](http://www.complexsql.com/indexing-in-sql/)

**2.What are indexes in SQL?(90 % asked in Performance Tuning Interview Questions)**

**Answer:**

**“Index is optional structure associated with the table which may or may not improve the performance of Query”**

In simple words suppose we want to search the topic in to book we go to index page of that book and search the topic which we want.Just like that to search the values from the table when indexing is there you need not use the full table scan.

[Click Here to Get 20 most important complex sql queries…](http://www.complexsql.com/20-sql-queries-for-interview/)

**3.What are advantages of Indexes?**

**Answer:**

Indexes are memory objects which are used to improve the performance of queries which allows faster retrieval of records.

Following are advantages of Indexes:

1.It allows faster retrieval of data

2.It avoids the Full table scan so that the performance of retrieving data from the table is faster.

3.It avoids the table access alltogether

4.Indexes always speeds up the select statement.

5.Indexes used to improve the Execution plan of the database

4.What are disadvantages of Indexes?(80 % asked in Performance Tuning Interview Questions)

**Disadvantages:**

1.Indexes slows down the performance of insert and update statements.So always we need follow best practice of disabling indexes before insert and update the table

2.Indexes takes additional disk space so by considering memory point indexes are costly.

**5.What is parser?**

**Answer:**

When SQL Statement has been written and generated then first step is parsing of that SQL Statement.Parsing is nothing but checking the syntaxes of SQL query.All the syntax of Query is correct or not is checked by SQL Parser.

There are 2 functions of parser:

1.Syntax analysis

2.Semantic analysis

[Click Here to know more about Parser….](http://www.complexsql.com/parser-and-optimizer-in-sql/)

**6.What are functions of Parser?**

**1.Syntax Analysis:**

The parser checks for SQL statement syntaxs.If the syntax is incorrect then parser gives the incorrect syntax error.

**2.Semantic Analysis:**

This checks for references of object and object attributes referenced are correct.

**7.What is mean by implicit index.Explain with example.**

**Answer:**

Whenever we define unique key or primary key constraints on the table  the index will automatically create on the table.These indexes are known as implicit indexes because these are created implicitly whenever the constraint has been applied to the table.These indexes are normal indexes not unique indexes.The indexes are normal because the columns already have defined as unique so uniqueness is already been applied.

Example:

Create table Employee

(Employee\_ID  varchar2(20) primary key,

Employee name varchar2(50),

salary number(10,0) not null);

If We check description of table:

**Desc Employee;**

Name                     Null                 Type

——————————————–

Employee\_ID        not null      varchar2

Employee\_name                      varchar2

Salary                    not null         number

Here you will see index is already created for Employee\_ID as it has defined primary key.

[Click Here to get information about indexes….](http://www.complexsql.com/indexing-in-sql/)

**8.What are Explicit Indexes?**

**Answer:**

The indexes which is created by user are called as explicit indexes.You can say the indexes which are created by ‘Create Index’ statement are called as Explicit indexes.

**Syntax:**

create index indexname on tablename(columnname);

**Example:**

Create index IND\_Employee\_ID on Employee(Employee\_ID);

**9.What are different types of indexes?**

**Answer:**

There are following types of indexes:

1.Normal Indexes

2.Bit map indexes

3.B-tree Indexes

4.Unique Indexes

5.Function Based Indexes

**10.What is mean by Unique Indexes?**

**Answer:**

1.To create unique index you must have CREATE ANY INDEX privilege.Here the concept is bit different.User needs to check the values of the table to create unique index.If table contains uniquely identified values in specified column then you should use unique index.

2.Especially while creating the table if we specify the primary key  then unique index is automatically created on that column.

3.But for Unique key constaint columns you separately need to do indexing.Kindly make sure that Unique key indexes created on the columns which has unique values only.

4.The unique indexes are also called as clustered indexes when primary key is defined on the column.

**Example:**

Create Unique index  Index\_name on Table\_name(Unique column name);

**Example:**

CREATE UNIQUE INDEX UI1\_EMP on EMP(EMP\_ID);

[Click Here to get information on basics of Performance Tuning..](http://www.complexsql.com/basics-sql-performance-tuning/)

**11.What are functional Based indexes?Explain with Example**

**Answer:**

1.Function based indexes allows us to index on the functional columns so that oracle engine will take the index and improves the performance of the query.

2.As per requirements we are using lot of SQL functions to fetch the results.Function based indexs gives ability to index the computed columns.

3.Function based indexes are easy to implement and it also provides immediate value.These indexes speeds up the application without changing application code or query.

**Example:**

**Syntax:**

Create index indexname on tablename(Function\_name(column\_name));

**Example:**

Create index FI\_Employee on Employee(trunc(Hire\_date));

**12.What is Bit-map index?Explain with Example.(90 % Asked in Performance Tuning Interview Questions)**

**Answer:**

1.If Table contains the distinct values which are not more than 20 distinct values then user should go for Bit map indexes.

2.User should avoid the indexing on each and every row and do the indexing only on distinct records of the table column.You should able to check drastic change in query cost after changing the normal index to Bit map index.

3.The bit map indexes are very much useful in dataware housing where there are low level of concurrent transactions.Bit map index stores row\_id as associated key value with bitmap and did the indexing only distinct values.

4.Means If in  1 million  records only 20 distinct values are there so Bitmap index only stores 20 values as bitmap and fetches the records from that 20 values only.

**Syntax:**

Create bitmap index Index\_name on Table\_name(Columns which have distinct values);

**Example:**

CREATE BITMAP index  BM\_DEPT\_NAME on DEPT(Department\_name);

**13.What is Optimizer?**

**Answer:**

Optimizer is nothing but the execution of query in optimum manner.Optimizer is most efficient way of processing the query.SQL parser ,SQL Optimizer and source code generator compiles the SQL statement.

**14.What are types of SQL Optimizer?**

**Answer:**

There are following types of optimizer:

1.Rule Based Optimizer

2.Cost Based Optimizer

**15.Explain Rule Based Optimizer?**

**Answer:**

When we execute any SQL statement ,the optimizer uses the predefined rules which defines what indexes are present in the database and which indexes needs to be executed during the execution.Rule Based optimizer is used to specify which table is been full scanned and which tables are taking the indexes during the execution.In Earlier the only optimizer which is used by Oracle is Rule Based optimizer

**“Rule Based Optimizer  specifies the rules for how to execute the query.”**

[Reference:Click here](http://www.complexsql.com/parser-and-optimizer-in-sql/)

**16.What is composite index?(90% asked in Performance Tuning Interview Questions)**

**Answer:**

When 2 or more columns are related to each other in the table and the same columns are used in where condition of the query then user can create index on both columns.These indexes are known as composite indexes.

**Example:**

Create index CI\_Employee on Employee(Eno,Deptno);

**17.What is cost based optimizer?**

**Answer:**

Cost Based Optimizer (CBO) uses the artificial intelligence to execute the Query. The Optimizer itself  decides the execution plan based on the cost of query. The cost based method means the database must decide which query execution plan to choose. It decides the query execution plan by deciding the statistical information based on  the database objects.(tables, indexes and clusters).The Oracle cost based optimizer is designed to determine the most effective way to carry out the SQL statement.

**“Cost based optimizer considers the statastical information of the table for query execution”**

[Click here to get most important questions asked in Tech Mahindra..](http://www.complexsql.com/sql-interview-questions-for-tech-mahindra/)

**17.What is visible/invisible property of index?**

**Answer:**

User can make the indexes visible and invisible by altering the indexes.Following statement is used to make indexes visible and invisible.

**ALTER INDEX index\_name VISIBLE;**

**18.What is mean by Clustered index?**

**Answer:**

1.The clustered indexes are indexes which are physically stored in order means it stores in ascending or descending order in Database.

2.Clustered indexes are created once for each table.When primary key is created then clustered index has been automatically created in the table.

3.If table is under heavy data modifications the clustered indexes are preferable to use.

**19.Can Index be Renamed?If Yes How?(90% asked inPerformance Tuning Interview Questions)**

**Answer:**

Yes we can rename the indexes.User should have create any index privilege to rename the index.

**Alter index Index\_name Rename to New\_indexname;**

**20.What is mean by non clustered indexes?(90 % asked in Performance Tuning Interview Questions)**

**Answer:**

1.The clustered indexes are used for searching purpose as we can create clustered indexes where primary is is defined.But Non clustered indexes are indexes which will be created on the multiple joining conditions,multiple filters used in query.

2.We can create 0 to 249 non-clustered indexes on single table.Foreign keys should be non clustered.

3.When user wants to retrieve heavy data from fields other than primary key the non clustered indexes are useful.

Hope everyone likes this article on SQL Optimization interview questions and answers.If you want PDF of this article kindly comment here.