101. What are cursors give different types of cursors.   
PL/SQL uses cursors for all database information accesses statements. The language supports the use two types of cursors   
Ø Implicit   
Ø Explicit   
  
102. What is cold backup and hot backup (in case of Oracle)?   
Ø Cold Backup:   
It is copying the three sets of files (database files, redo logs, and control file) when the instance is shut down. This is a straight file copy, usually from the disk directly to tape. You must shut down the instance to guarantee a consistent copy.   
If a cold backup is performed, the only option available in the event of data file loss is restoring all the files from the latest backup. All work performed on the database since the last backup is lost.   
Ø Hot Backup:   
Some sites (such as worldwide airline reservations systems) cannot shut down the database while making a backup copy of the files. The cold backup is not an available option.   
So different means of backing up database must be used — the hot backup. Issue a SQL command to indicate to Oracle, on a tablespace-by-tablespace basis, that the files of the tablespace are to backed up. The users can continue to make full use of the files, including making changes to the data. Once the user has indicated that he/she wants to back up the tablespace files, he/she can use the operating system to copy those files to the desired backup destination.   
The database must be running in ARCHIVELOG mode for the hot backup option.   
If a data loss failure does occur, the lost database files can be restored using the hot backup and the online and offline redo logs created since the backup was done. The database is restored to the most consistent state without any loss of committed transactions.   
  
103. What are Armstrong rules? How do we say that they are complete and/or sound   
The well-known inference rules for FDs   
Ø Reflexive rule :   
If Y is subset or equal to X then X Y.   
Ø Augmentation rule:   
If X Y then XZ YZ.   
Ø Transitive rule:   
If {X Y, Y Z} then X Z.   
Ø Decomposition rule :

If X YZ then X Y.   
Ø Union or Additive rule:   
If {X Y, X Z} then X YZ.   
Ø Pseudo Transitive rule :   
If {X Y, WY Z} then WX Z.   
Of these the first three are known as Amstrong Rules. They are sound because it is enough if a set of FDs satisfy these three. They are called complete because using these three rules we can generate the rest all inference rules.   
  
104. How can you find the minimal key of relational schema?   
Minimal key is one which can identify each tuple of the given relation schema uniquely. For finding the minimal key it is required to find the closure that is the set of all attributes that are dependent on any given set of attributes under the given set of functional dependency.   
Algo. I Determining X+, closure for X, given set of FDs F   
1. Set X+ = X   
2. Set Old X+ = X+   
3. For each FD Y Z in F and if Y belongs to X+ then add Z to X+   
4. Repeat steps 2 and 3 until Old X+ = X+   
  
Algo.II Determining minimal K for relation schema R, given set of FDs F   
1. Set K to R that is make K a set of all attributes in R   
2. For each attribute A in K   
a. Compute (K – A)+ with respect to F   
b. If (K – A)+ = R then set K = (K – A)+   
  
  
105. What do you understand by dependency preservation?   
Given a relation R and a set of FDs F, dependency preservation states that the closure of the union of the projection of F on each decomposed relation Ri is equal to the closure of F. i.e.,   
((PR1(F)) U … U (PRn(F)))+ = F+   
if decomposition is not dependency preserving, then some dependency is lost in the decomposition.

106. What is meant by Proactive, Retroactive and Simultaneous Update.   
Proactive Update:   
The updates that are applied to database before it becomes effective in real world .   
Retroactive Update:   
The updates that are applied to database after it becomes effective in real world .   
Simulatneous Update:   
The updates that are applied to database at the same time when it becomes effective in real world .   
  
107. What are the different types of JOIN operations?   
Equi Join: This is the most common type of join which involves only equality comparisions. The disadvantage in this type of join is that there.

**FAQ In SQL**

1. Which is the subset of SQL commands used to manipulate Oracle Database structures, including tables?   
Data Definition Language (DDL)   
  
2. What operator performs pattern matching?   
LIKE operator   
  
3. What operator tests column for the absence of data?   
IS NULL operator   
  
4. Which command executes the contents of a specified file?   
START <filename> or @<filename>   
  
5. What is the parameter substitution symbol used with INSERT INTO command?   
&   
  
6. Which command displays the SQL command in the SQL buffer, and then executes it?   
RUN

7. What are the wildcards used for pattern matching?   
\_ for single character substitution and % for multi-character substitution   
  
8. State true or false. EXISTS, SOME, ANY are operators in SQL.   
True   
  
9. State true or false. !=, <>, ^= all denote the same operation.   
True   
  
10. What are the privileges that can be granted on a table by a user to others?   
Insert, update, delete, select, references, index, execute, alter, all   
  
11. What command is used to get back the privileges offered by the GRANT command?   
REVOKE   
  
12. Which system tables contain information on privileges granted and privileges obtained?   
USER\_TAB\_PRIVS\_MADE, USER\_TAB\_PRIVS\_RECD   
  
13. Which system table contains information on constraints on all the tables created?   
USER\_CONSTRAINTS   
  
14. TRUNCATE TABLE EMP;   
DELETE FROM EMP;   
Will the outputs of the above two commands differ?   
Both will result in deleting all the rows in the table EMP.   
  
15. What is the difference between TRUNCATE and DELETE commands?   
TRUNCATE is a DDL command whereas DELETE is a DML command. Hence DELETE operation can be rolled back, but TRUNCATE operation cannot be rolled back. WHERE clause can be used with DELETE and not with TRUNCATE.   
  
16. What command is used to create a table by copying the structure of another table?   
Answer :   
CREATE TABLE .. AS SELECT command   
Explanation :   
To copy only the structure, the WHERE clause of the SELECT command should contain a FALSE statement as in the following.   
CREATE TABLE NEWTABLE AS SELECT \* FROM EXISTINGTABLE WHERE 1=2;   
If the WHERE condition is true, then all the rows or rows satisfying the condition will be copied to the new table.

17. What will be the output of the following query?   
SELECT REPLACE(TRANSLATE(LTRIM(RTRIM('!! ATHEN !!','!'), '!'), 'AN', '\*\*'),'\*','TROUBLE') FROM DUAL;   
TROUBLETHETROUBLE   
  
18. What will be the output of the following query?   
SELECT DECODE(TRANSLATE('A','1234567890','1111111111'), '1','YES', 'NO' );   
Answer :   
NO   
Explanation :   
The query checks whether a given string is a numerical digit.   
  
19. What does the following query do?   
SELECT SAL + NVL(COMM,0) FROM EMP;   
This displays the total salary of all employees. The null values in the commission column will be replaced by 0 and added to salary.   
  
  
20. Which date function is used to find the difference between two dates?   
MONTHS\_BETWEEN   
  
21. Why does the following command give a compilation error?   
DROP TABLE &TABLE\_NAME;   
Variable names should start with an alphabet. Here the table name starts with an '&' symbol.   
  
22. What is the advantage of specifying WITH GRANT OPTION in the GRANT command?   
The privilege receiver can further grant the privileges he/she has obtained from the owner to any other user.   
  
23. What is the use of the DROP option in the ALTER TABLE command?   
It is used to drop constraints specified on the table.   
  
24. What is the value of ‘comm’ and ‘sal’ after executing the following query if the initial value of ‘sal’ is 10000?   
UPDATE EMP SET SAL = SAL + 1000, COMM = SAL\*0.1;   
sal = 11000, comm = 100025. What is the use of DESC in SQL?   
Answer :   
DESC has two purposes. It is used to describe a schema as well as to retrieve rows from table in descending order.   
Explanation :   
The query SELECT \* FROM EMP ORDER BY ENAME DESC will display the output sorted on ENAME in descending order.   
  
26. What is the use of CASCADE CONSTRAINTS?   
When this clause is used with the DROP command, a parent table can be dropped even when a child table exists.   
  
27. Which function is used to find the largest integer less than or equal to a specific value?   
FLOOR   
  
28. What is the output of the following query?   
SELECT TRUNC(1234.5678,-2) FROM DUAL;   
1200   
  
  
  
  
  
SQL – QUERIES   
  
I. SCHEMAS   
  
Table 1 : STUDIES   
  
PNAME (VARCHAR), SPLACE (VARCHAR), COURSE (VARCHAR), CCOST (NUMBER)   
  
Table 2 : SOFTWARE   
  
PNAME (VARCHAR), TITLE (VARCHAR), DEVIN (VARCHAR), SCOST (NUMBER), DCOST (NUMBER), SOLD (NUMBER)   
  
Table 3 : PROGRAMMER   
  
PNAME (VARCHAR), DOB (DATE), DOJ (DATE), SEX (CHAR), PROF1 (VARCHAR), PROF2 (VARCHAR), SAL (NUMBER) LEGEND :   
  
PNAME – Programmer Name, SPLACE – Study Place, CCOST – Course Cost, DEVIN – Developed in, SCOST – Software Cost, DCOST – Development Cost, PROF1 – Proficiency 1   
  
QUERIES :   
  
1. Find out the selling cost average for packages developed in Oracle.   
2. Display the names, ages and experience of all programmers.   
3. Display the names of those who have done the PGDCA course.   
4. What is the highest number of copies sold by a package?   
5. Display the names and date of birth of all programmers born in April.   
6. Display the lowest course fee.   
7. How many programmers have done the DCA course.   
8. How much revenue has been earned through the sale of packages developed in C.   
9. Display the details of software developed by Rakesh.   
10. How many programmers studied at Pentafour.   
11. Display the details of packages whose sales crossed the 5000 mark.   
12. Find out the number of copies which should be sold in order to recover the development cost of each package.   
13. Display the details of packages for which the development cost has been recovered.   
14. What is the price of costliest software developed in VB?   
15. How many packages were developed in Oracle ?   
16. How many programmers studied at PRAGATHI?   
17. How many programmers paid 10000 to 15000 for the course?   
18. What is the average course fee?   
19. Display the details of programmers knowing C.   
20. How many programmers know either C or Pascal?   
21. How many programmers don’t know C and C++?   
22. How old is the oldest male programmer?   
23. What is the average age of female programmers?   
24. Calculate the experience in years for each programmer and display along with their names in descending order.   
25. Who are the programmers who celebrate their birthdays during the current month?

26. How many female programmers are there?   
27. What are the languages known by the male programmers?   
28. What is the average salary?   
29. How many people draw 5000 to 7500?   
30. Display the details of those who don’t know C, C++ or Pascal.   
31. Display the costliest package developed by each programmer.   
32. Produce the following output for all the male programmers   
Programmer   
Mr. Arvind – has 15 years of experience   
  
KEYS:   
  
1. SELECT AVG(SCOST) FROM SOFTWARE WHERE DEVIN = 'ORACLE';   
2. SELECT PNAME,TRUNC(MONTHS\_BETWEEN(SYSDATE,DOB)/12) "AGE", TRUNC(MONTHS\_BETWEEN(SYSDATE,DOJ)/12) "EXPERIENCE" FROM PROGRAMMER;   
3. SELECT PNAME FROM STUDIES WHERE COURSE = 'PGDCA';   
4. SELECT MAX(SOLD) FROM SOFTWARE;   
5. SELECT PNAME, DOB FROM PROGRAMMER WHERE DOB LIKE '%APR%';   
6. SELECT MIN(CCOST) FROM STUDIES;   
7. SELECT COUNT(\*) FROM STUDIES WHERE COURSE = 'DCA';   
8. SELECT SUM(SCOST\*SOLD-DCOST) FROM SOFTWARE GROUP BY DEVIN HAVING DEVIN = 'C';   
9. SELECT \* FROM SOFTWARE WHERE PNAME = 'RAKESH';   
10. SELECT \* FROM STUDIES WHERE SPLACE = 'PENTAFOUR';   
11. SELECT \* FROM SOFTWARE WHERE SCOST\*SOLD-DCOST > 5000;   
12. SELECT CEIL(DCOST/SCOST) FROM SOFTWARE;   
13. SELECT \* FROM SOFTWARE WHERE SCOST\*SOLD >= DCOST;   
14. SELECT MAX(SCOST) FROM SOFTWARE GROUP BY DEVIN HAVING DEVIN = 'VB';   
15. SELECT COUNT(\*) FROM SOFTWARE WHERE DEVIN = 'ORACLE';   
16. SELECT COUNT(\*) FROM STUDIES WHERE SPLACE = 'PRAGATHI';   
17. SELECT COUNT(\*) FROM STUDIES WHERE CCOST BETWEEN 10000 AND 15000;   
18. SELECT AVG(CCOST) FROM STUDIES;   
19. SELECT \* FROM PROGRAMMER WHERE PROF1 = 'C' OR PROF2 = 'C';   
20. SELECT \* FROM PROGRAMMER WHERE PROF1 IN ('C','PASCAL') OR PROF2 IN ('C','PASCAL');   
21. SELECT \* FROM PROGRAMMER WHERE PROF1 NOT IN ('C','C++') AND PROF2 NOT IN ('C','C++');

22. SELECT TRUNC(MAX(MONTHS\_BETWEEN(SYSDATE,DOB)/12)) FROM PROGRAMMER WHERE SEX = 'M';   
23. SELECT TRUNC(AVG(MONTHS\_BETWEEN(SYSDATE,DOB)/12)) FROM PROGRAMMER WHERE SEX = 'F';   
24. SELECT PNAME, TRUNC(MONTHS\_BETWEEN(SYSDATE,DOJ)/12) FROM PROGRAMMER ORDER BY PNAME DESC;   
25. SELECT PNAME FROM PROGRAMMER WHERE TO\_CHAR(DOB,'MON') = TO\_CHAR(SYSDATE,'MON');   
26. SELECT COUNT(\*) FROM PROGRAMMER WHERE SEX = 'F';   
27. SELECT DISTINCT(PROF1) FROM PROGRAMMER WHERE SEX = 'M';   
28. SELECT AVG(SAL) FROM PROGRAMMER;   
29. SELECT COUNT(\*) FROM PROGRAMMER WHERE SAL BETWEEN 5000 AND 7500;   
30. SELECT \* FROM PROGRAMMER WHERE PROF1 NOT IN ('C','C++','PASCAL') AND PROF2 NOT IN ('C','C++','PASCAL');   
31. SELECT PNAME,TITLE,SCOST FROM SOFTWARE WHERE SCOST IN (SELECT MAX(SCOST) FROM SOFTWARE GROUP BY PNAME);   
32.SELECT 'Mr.' || PNAME || ' - has ' || TRUNC(MONTHS\_BETWEEN(SYSDATE,DOJ)/12) || ' years of experience' “Programmer” FROM PROGRAMMER WHERE SEX = 'M' UNION SELECT 'Ms.' || PNAME || ' - has ' || TRUNC (MONTHS\_BETWEEN (SYSDATE,DOJ)/12) || ' years of experience' “Programmer” FROM PROGRAMMER WHERE SEX = 'F';   
II . SCHEMA :   
  
Table 1 : DEPT   
  
DEPTNO (NOT NULL , NUMBER(2)), DNAME (VARCHAR2(14)),   
LOC (VARCHAR2(13)   
  
Table 2 : EMP   
  
EMPNO (NOT NULL , NUMBER(4)), ENAME (VARCHAR2(10)),   
JOB (VARCHAR2(9)), MGR (NUMBER(4)), HIREDATE (DATE),   
SAL (NUMBER(7,2)), COMM (NUMBER(7,2)), DEPTNO (NUMBER(2))   
  
MGR is the empno of the employee whom the employee reports to. DEPTNO is a foreign key.   
QUERIES   
1. List all the employees who have at least one person reporting to them.   
2. List the employee details if and only if more than 10 employees are present in department no 10.   
3. List the name of the employees with their immediate higher authority.   
4. List all the employees who do not manage any one.   
5. List the employee details whose salary is greater than the lowest salary of an employee belonging to deptno 20.

6. List the details of the employee earning more than the highest paid manager.   
7. List the highest salary paid for each job.   
8. Find the most recently hired employee in each department.   
9. In which year did most people join the company? Display the year and the number of employees.   
10. Which department has the highest annual remuneration bill?   
11. Write a query to display a ‘\*’ against the row of the most recently hired employee.   
12. Write a correlated sub-query to list out the employees who earn more than the average salary of their department.   
13. Find the nth maximum salary.   
14. Select the duplicate records (Records, which are inserted, that already exist) in the EMP table.   
15. Write a query to list the length of service of the employees (of the form n years and m months).   
  
KEYS:   
  
1. SELECT DISTINCT(A.ENAME) FROM EMP A, EMP B WHERE A.EMPNO = B.MGR; or SELECT ENAME FROM EMP WHERE EMPNO IN (SELECT MGR FROM EMP);   
2. SELECT \* FROM EMP WHERE DEPTNO IN (SELECT DEPTNO FROM EMP GROUP BY DEPTNO HAVING COUNT(EMPNO)>10 AND DEPTNO=10);   
3. SELECT A.ENAME "EMPLOYEE", B.ENAME "REPORTS TO" FROM EMP A, EMP B WHERE A.MGR=B.EMPNO;   
4. SELECT \* FROM EMP WHERE EMPNO IN ( SELECT EMPNO FROM EMP MINUS SELECT MGR FROM EMP);   
5. SELECT \* FROM EMP WHERE SAL > ( SELECT MIN(SAL) FROM EMP GROUP BY DEPTNO HAVING DEPTNO=20);   
6. SELECT \* FROM EMP WHERE SAL > ( SELECT MAX(SAL) FROM EMP GROUP BY JOB HAVING JOB = 'MANAGER' );   
7. SELECT JOB, MAX(SAL) FROM EMP GROUP BY JOB;   
8. SELECT \* FROM EMP WHERE (DEPTNO, HIREDATE) IN (SELECT DEPTNO, MAX(HIREDATE) FROM EMP GROUP BY DEPTNO);   
9. SELECT TO\_CHAR(HIREDATE,'YYYY') "YEAR", COUNT(EMPNO) "NO. OF EMPLOYEES" FROM EMP GROUP BY TO\_CHAR(HIREDATE,'YYYY') HAVING COUNT(EMPNO) = (SELECT MAX(COUNT(EMPNO)) FROM EMP GROUP BY TO\_CHAR(HIREDATE,'YYYY'));   
10. SELECT DEPTNO, LPAD(SUM(12\*(SAL+NVL(COMM,0))),15) "COMPENSATION" FROM EMP GROUP BY DEPTNO HAVING SUM( 12\*(SAL+NVL(COMM,0))) = (SELECT MAX(SUM(12\*(SAL+NVL(COMM,0)))) FROM EMP GROUP BY DEPTNO);   
11. SELECT ENAME, HIREDATE, LPAD('\*', "RECENTLY HIRED" FROM EMP WHERE HIREDATE = (SELECT MAX(HIREDATE) FROM EMP) UNION SELECT ENAME NAME, HIREDATE, LPAD(' ',15) "RECENTLY HIRED" FROM EMP WHERE HIREDATE != (SELECT MAX(HIREDATE) FROM EMP);   
12. SELECT ENAME,SAL FROM EMP E WHERE SAL > (SELECT AVG(SAL) FROM EMP F WHERE E.DEPTNO = F.DEPTNO);   
13. SELECT ENAME, SAL FROM EMP A WHERE &N = (SELECT COUNT (DISTINCT(SAL)) FROM EMP B WHERE A.SAL<=B.SAL);   
14. SELECT \* FROM EMP A WHERE A.EMPNO IN (SELECT EMPNO FROM EMP GROUP BY EMPNO HAVING COUNT(EMPNO)>1) AND A.ROWID!=MIN (ROWID));   
15. SELECT ENAME "EMPLOYEE",TO\_CHAR(TRUNC(MONTHS\_BETWEEN(SYSDATE,HIREDATE)/12))||' YEARS '|| TO\_CHAR(TRUNC(MOD(MONTHS\_BETWEEN (SYSDATE, HIREDATE),12)))||' MONTHS ' "LENGTH OF SERVICE" FROM EMP;