PLSQL Interview Question:

DDL - Data definition Language

CREATE: Create table with Primary Key

```
CREATE TABLE table_name (
  emp_id INT,
  emp_name VARCHAR(10),
  emp_address VARCHAR(45),
  mobile_no INT,
  PRIMARY KEY (emp_id)
);
```

#Create table with Primary Key, Not Null, Unique and Auto Increment

```
create table  table_name (
sr_no  int  auto_increment,
me_code  varchar(15),
me_name  varchar(25),
mobile_no  int,
primary key  (sr_no),
UNIQUE INDEX  me_code_UNIQUE  (me_code)
);
```

#Create table with Foreign Key

```
create table table_team(
   team_name VARCHAR2(10),
   team_profile varchar2(15),
   emp_id int references table_name(emp_id)
);
```

ALTER:

a) Add Column

```
alter table table_name add empid int;
alter table table_name add emp_address varchar(45);
```

b)Remove Column

```
ALTER TABLE  table_name  DROP me_address;
ALTER TABLE table_name   DROP column me_adhar_no;
```

c)Modify Column

```
alter table table_name  MODIFY emp_address varchar(45);
alter table aksh4 modify mobile_no bigint;
```

d)Rename Table name

```
alter table table_name  rename to table_name2  ;
```

e)Constraints Modify

alter table table_name add **UNIQUE INDEX** me_code_UNIQUE (me_code);

alter table table_name add constraint foreign_key_name foreign key (team_id) references table_name(emp_id);

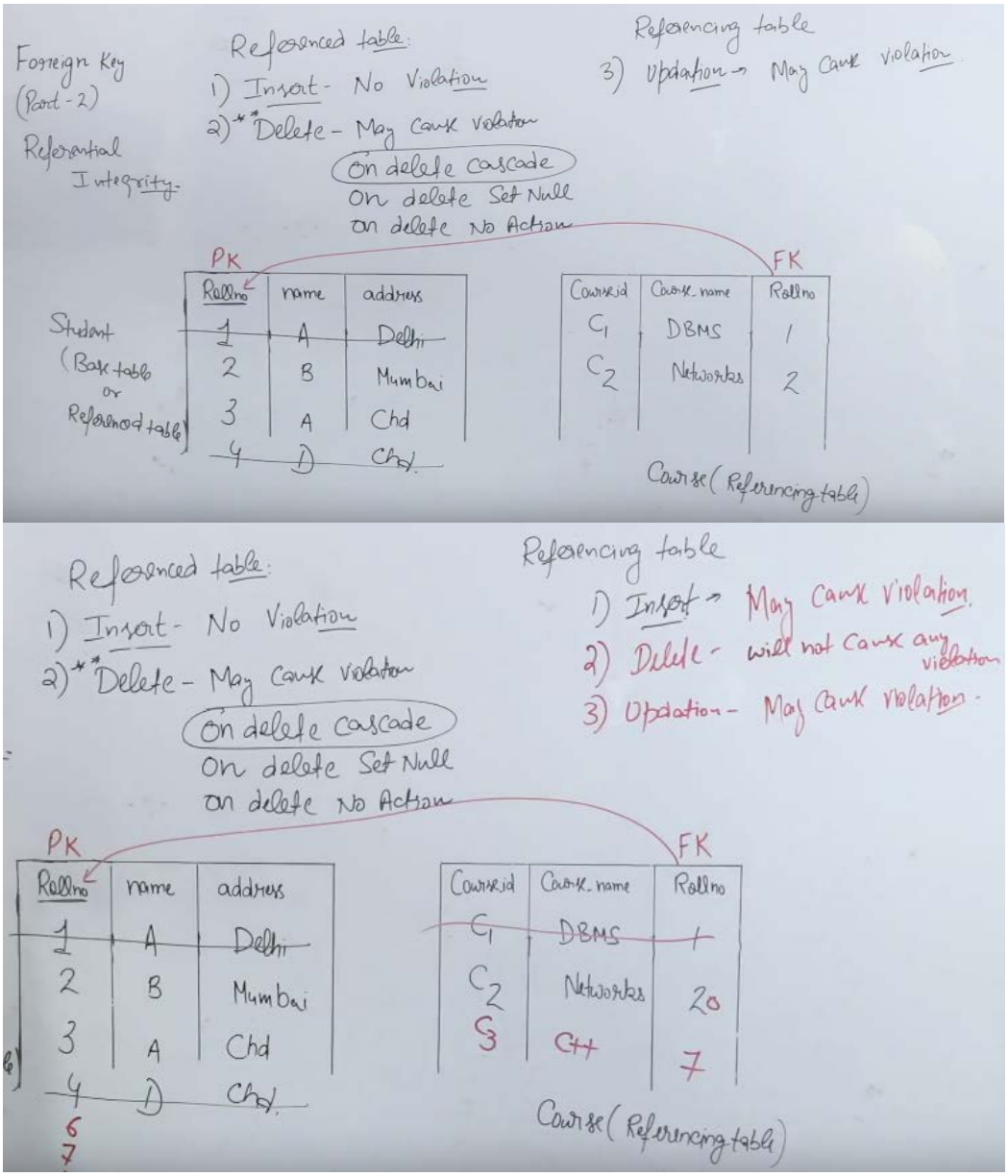
e.g

alter table table_team add constraint foreign_key_name foreign key (emp_id) references table_name(emp_id);

CONSTRAINTS:

Primary Key: In Single table only on primary key is allowed

Foreign Key: One table can have multiple foreign key column



DROP:

drop table table_name;

TRUNCATE:

truncate table table_name;

DML - Data Manipulation Language (DISU)

SET SQL_SAFE_UPDATES = 0;

SELECT :

LIKE CONDITION

```
select * from table_name where me_name like '%Sushil%';
select me_code,me_name from aksh4;.

select * from table_name:
SELECT COUNT(*) FROM CITY;
SELECT * FROM CITY order by Population asc;
SELECT * FROM CITY order by id desc;
SELECT * FROM CITY WHERE NAME='Kabul';
select * from city where countRycode='NLD' and district='Noord-Holland' and id=25;
select * from city where id between 100 and 105;
```

INSERT:

```
insert into table_name (empid,empname,empaddress) values (95,'sushil','mumbai');
insert into table_name (emp_name) values ('sushil');
```

UPDATE:

```
update  table_name  set mobile_no=8007306992461121458;
UPDATE table_name SET emp_add = 'navi mumbai' where sr_no=16;
UPDATE table_name SET EMP_NAME ='BMS';
```

DELETE:

```
delete from table_name where sr_no between 4 and 7;
```

Sequence:

```
CREATE SEQUENCE customers_seq
 START WITH     1000
 INCREMENT BY   1
 NOCACHE
 NOCYCLE;

E.g We have specify SEQUENCE
insert into aksh4 (SR_NO,me_code,me_name,mobile_no) values
(SEQ_SR_NO.NEXTVAL,'A113','Sushil33',1234567892);
```

Auto Increment:

```
ALTER TABLE table_name  AUTO_INCREMENT = 2000;

e.g No need to specify sr_no in insert query
insert into aksh4 (me_code,me_name,mobile_no) values ('A113','Sushil33',1234567892);

SELECT * FROM COLLEGESTD;
SELECT * FROM DEPT;

INSERT INTO COLLEGESTD (STD_ID,STD_NAME,STD_ADDRESS,MOBILE_NO,DEPT_ID) VALUES
(6,'bhumi','delhi',78794563,102);
```

update COLLEGESTD set dept_id=100 where std_id=1;

select COLLEGESTD.std_id,COLLEGESTD.std_name,dept.std_name,COLLEGESTD. mobile_no from COLLEGESTD
join DEPT
on COLLEGESTD.dept_id = dept.dept_id
where COLLEGESTD.std_id in (select max(COLLEGESTD.std_id) from COLLEGESTD group by COLLEGESTD.dept_id) ;

MySQL Database

PL/SQL:

Example 1:

```
CREATE DEFINER=`root`@`localhost` PROCEDURE `addition_proc`(IN FIR int,IN SEC int,OUT THI int)
BEGIN
 set  THI=FIR+SEC;
END
```

To run:

```
set @FIR=10, @SEC=20 ;
CALL addition_proc(@FIR,@SEC,@THI);
select @THI;
```

Example 2:

```
CREATE DEFINER=`root`@`localhost` PROCEDURE `city_list`(IN CITY_ID INT, OUT CITY_NAME VARCHAR(255) )
BEGIN
SELECT NAME INTO CITY_NAME FROM CITY  WHERE ID = CITY_ID;
END
```

To Run:

```
set @CITY_ID=2;
CALL city_list(@CITY_ID,@CITY_NAME);
SELECT @CITY_NAME;
```

SEQUENCE:

SELECT SEQ_MERCHANTCODE.NEXTVAL FROM DUAL;

DESC TABLE_NAME;

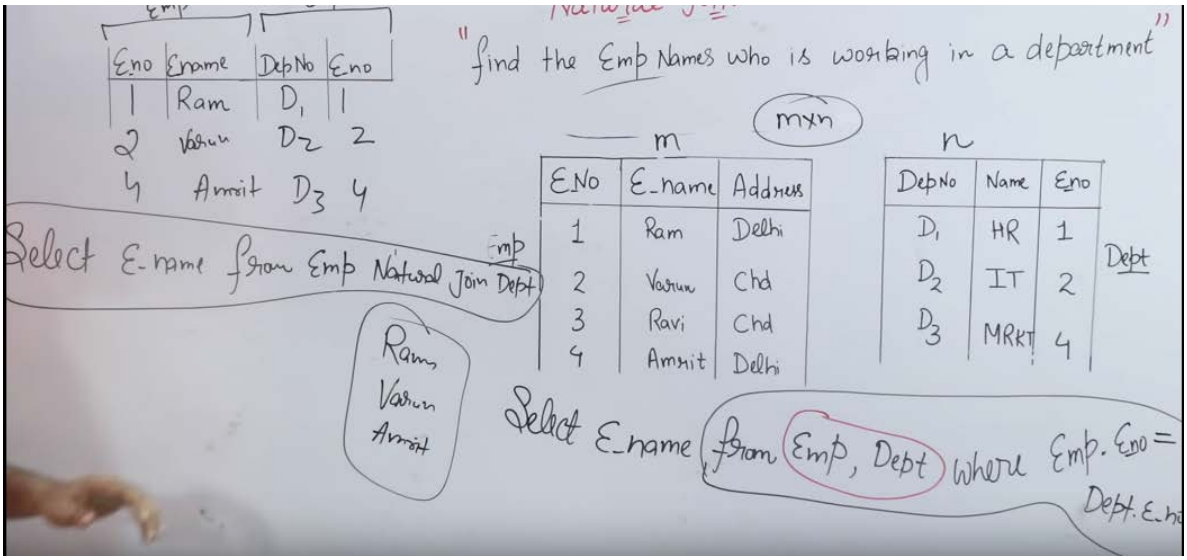
VIEWS:

FUNCTIONS:

TRIGGERS:

Joins IN SQL

NATURAL JOIN: if you are using natural join keyword in between then e_no should be same in both table , otherwise use (crossproduct + where conditions)



Example 1:

```
CREATE OR REPLACE PROCEDURE PROC_EMPLOYEE(EMPNAME IN VARCHAR2,ADDRESS IN VARCHAR2,MOBILENO
IN INT)
AS

SEQID INT;

BEGIN

SEQID :=SEQ_MERCHANTCODE.NEXTVAL;

INSERT
INTO TABLE_NAME
 (
  EMP_ID,
  EMP_NAME,
  EMP_ADDRESS,
  MOBILE_NO
 )
 VALUES
 (
  SEQID,
  EMPNAME,
  ADDRESS,
  MOBILENO
 );
 COMMIT;

 DELETE FROM TABLE_NAME WHERE EMP_ID=(SEQID-5);
```

```
 COMMIT;

 DBMS_OUTPUT.PUT_LINE('HELLO WORLD');
END PROC_EMPLOYEE;
```

Example:2

```
create or replace PROCEDURE PROC_DEMO1 ( NUM1 IN NUMBER , NUM2 IN NUMBER , NUM3 OUT NUMBER ) AS
BEGIN

 NUM3 := (NUM1+NUM2);
 DBMS_OUTPUT.PUT_LINE(NUM3);

END PROC_DEMO1;
```

TO procedure execute using command:

```
declare
x number;
BEGIN
PROC_DEMO1(10,20,x);
end ;
```

To Create Package and inside package multiple procedure

```
 Package:
 create or replace PACKAGE  YOUR_PACKAGE_NAME
 AS
 PROCEDURE  GET_DATA ( MID  VARCHAR2,FROMDATE DATE, MY_CURSOR  OUT  SYS_REFCURSOR );

 END  YOUR_PACKAGE_NAME;

 create or replace PACKAGE BODY  YOUR_PACKAGE_NAME
 AS
 PROCEDURE  GET_DATA ( MID  VARCHAR2,FROMDATE DATE,  MY_CURSOR OUT SYS_REFCURSOR )
 IS
 BEGIN

 IF MID IS NULL THEN
 OPEN  MY_CURSOR FOR

 SELECT * FROM  TABLE_NAME1;

 ELSE

 OPEN  MY_CURSOR FOR
 SELECT * FROM  TABLE_NAME2;

 END IF;
 EXCEPTION
```

```
WHEN OTHERS THEN
RAISE;

END GET_DATA;

END YOUR_PACKAGE_NAME;
```

Procedure:

1. cannot return any values through the RETURN statement.
2. CREATE PROCEDURE instructs the compiler to create new procedure. Keyword 'OR REPLACE' instructs the compile to replace the existing procedure (if any) with the current one.
3. Procedure name should be unique.
4. Keyword 'IS' will be used, when the procedure is nested into some other blocks. If the procedure is standalone then 'AS' will be used. Other than this coding standard, both have the same meaning.

EXAMPLE 1:

```
create or replace PACKAGE  YOUR_PACKAGE_NAME AS
PROCEDURE  GET_DATA (MY_CURSOR  OUT  SYS_REFCURSOR ); PROCEDURE
GET_SINGLE_RESPONSE(P_RESPONSE OUT  VARCHAR2);

END  YOUR_PACKAGE_NAME;

--BODY
create or replace PACKAGE BODY  YOUR_PACKAGE_NAME AS
PROCEDURE  GET_DATA(MY_CURSOR OUT SYS_REFCURSOR ) IS
BEGIN
OPEN  MY_CURSOR FOR
SELECT * FROM EPORTAL_TERMINAL; EXCEPTION
WHEN OTHERS THEN RAISE;
END GET_DATA;

PROCEDURE GET_SINGLE_RESPONSE(P_RESPONSE OUT  VARCHAR2) IS
 ERR_NUM  NUMBER; ERR_MSG
VARCHAR2(100); BEGIN
--ANY LOGIC CAN BE WRIITEN HERE
--SELECT * FROM EPORTAL_TERMINAL; P_RESPONSE
:='SUCCESS BHACCHI'; EXCEPTION
WHEN OTHERS THEN P_RESPONSE
 :='ERROR'; RAISE;
END GET_SINGLE_RESPONSE; END

YOUR_PACKAGE_NAME;
```

What is Function?

Functions is a standalone PL/SQL subprogram. Like PL/SQL procedure, functions have a unique name by which it can be referred. These are stored as PL/SQL database objects. Below are some of the characteristics of functions.

- Functions are a standalone block that is mainly used for calculation purpose.
- Function use RETURN keyword to return the value, and the datatype of this is defined at the time of creation.
- A Function should either return a value or raise the exception, i.e. return is mandatory in functions.
- Function with no DML statements can be directly called in SELECT query whereas the function with DML operation can only be called from other PL/SQL blocks.
- It can have nested blocks, or it can be defined and nested inside the other blocks or packages.
- It contains declaration part (optional), execution part, exception handling part (optional).
- The values can be passed into the function or fetched from the procedure through the parameters.
- These parameters should be included in the calling statement.
- Function can also return the value through OUT parameters other than using RETURN
- Since it will always return the value, in calling statement it always accompanies with assignment operator to populate the variables.

Procedure Vs. Function: Key Differences

Procedure	Function
• Used mainly to a execute certain process	• Used mainly to perform some calculation
• Cannot call in SELECT statement	• A Function that contains no DML statements can be called in SELECT statement
• Use OUT parameter to return the value	• Use RETURN to return the value
• It is not mandatory to return the value	• It is mandatory to return the value
• RETURN will simply exit the control from subprogram.	• RETURN will exit the control from subprogram and also returns the value
• Return datatype will not be specified at the time of creation	• Return datatype is mandatory at the time of creation

Built-in Functions in PL/SQL

PL/SQL contains various built-in functions to work with strings and date datatype. Here we are going to see the commonly used functions and their usage.

Conversion Functions

These built-in functions are used to convert one datatype to another datatype.

Function Name	Usage	EXAMPLE
TO_CHAR	Converts the other datatype to character datatype	TO_CHAR(123);
TO_DATE (string, format)	Converts the given string to date. The string should match with the format.	TO_DATE('2015-JAN-15', 'YYYY-MON-DD'); Output: 1/15/2015
TO_NUMBER (text, format)	Converts the text to number type of the given format. Informat '9' denotes the number of digits	Select TO_NUMBER('1234','9999') fro m dual; Output: 1234 Select TO_NUMBER('1,234.45','9,999. 99') from dual; Output: 1234

String Functions

These are the functions that are used on the character datatype.

Function Name	Usage	EXAMPLE
INSTR(text, string, start , occurance)	Gives the position of particular text in the given string. • text – Main string • string – text that need to be searched • start – starting position of the search (optional) • accordance – occurrence of the searched string (optional)	Select INSTR('AEROPLANE','E',2,1) from dual **Output**: 2 Select INSTR('AEROPLANE','E',2,2) from dual Output: 9 (2nd occurance of E)
SUBSTR (text, start, le ngth)	Gives the substring value of the main string. • text – main string • start – starting position • length – length to be sub stringed	select substr('aeroplane',1,7) from dual **Output**: aeropla
UPPER (text)	Returns the uppercase of the provided text	Select upper('guru99') from dual; **Output**: GURU99
LOWER (text)	Returns the lowercase of the provided text	Select lower ('AerOpLane') from dual; **Output**: aeroplane

Function Name	Usage	EXAMPLE
INITCAP (text)	Returns the given text with the starting letter in upper case.	Select ('guru99') from dual **Output**: Guru99 Select ('my story') from dual **Output**: My Story
LENGTH (text)	Returns the length of the given string	Select LENGTH ('guru99') from dual; **Output**: 6
LPAD (text, length, pad_char)	Pads the string in the left side for the given length (total string) with the given character	Select LPAD('guru99', 10, '$') from dual; **Output**: $$$$guru99
RPAD (text, length, pad_char)	Pads the string in the right side for the given length (total string) with the given character	Select RPAD('guru99',10,'-') from dual **Output**: guru99----
LTRIM (text)	Trims the leading white space from the text	Select LTRIM(' Guru99') from dual; **Output**: Guru99
RTRIM (text)	Trims the trailing white space from the text	Select RTRIM('Guru99 ') from dual; **Output**; Guru99

Date Functions

These are functions that are used for manipulating with dates.

Function Name	Usage	EXAMPLE
ADD_MONTHS (date, no.of months)	Adds the given months to the date	ADD_MONTH('2015-01-01',5); **Output**: 05/01/2015
SYSDATE	Returns the current date and time of the server	Select SYSDATE from dual; **Output**: 10/4/2015 2:11:43 PM
TRUNC	Round of the date variable to the lower possible value	select sysdate, TRUNC(sysdate) from dual; **Output**: 10/4/2015 2:12:39 PM 10/4/2015
ROUND	Rounds the date to the nearest limit either higher or lower	Select sysdate, ROUND(sysdate) from dual **Output**: 10/4/2015 2:14:34 PM 10/5/2015
MONTHS_BETWEEN	Returns the number of months between two dates	Select MONTHS_BETWEEN (sysdate+60, sysdate) from dual **Output**:

Q #3) How will you differentiate between VARCHAR & VARCHAR2?

VARCHAR can store characters up to 2000 bytes while VARCHAR2 can store up to 4000 bytes.

VARCHAR will hold the space for characters defined during declaration even if all of them are not used whereas VARCHAR2 will release the unused space.

Q #4) What is the difference between TRUNCATE & DELETE command?

Ans: Both the commands are used to remove data from a database.

The finer differences between the two include:

- TRUNCATE is a DDL operation while DELETE is a DML operation.
- The TRUNCATE command will free the object storage space while the DELETE command does not.

Q #7) What is the difference between SUBSTR & INSTR functions?

Ans: SUBSTR function returns the sub-part identified by numeric values from the provided string.
Example: [Select SUBSTR ('India is my country', 1, 4) from dual] will return "Indi".
INSTR will return the position number of the sub-string within the string.

Example: [SELECT INSTR ('India is my country', 'a') from dual] will return 5.

Q #8) How can we find out the duplicate values in an Oracle table?

```
SELECT EMP_NAME, COUNT (EMP_NAME)
FROM EMP
GROUP BY EMP_NAME
HAVING COUNT (EMP_NAME) > 1;
```

Q #10) What is a NVL function? How can it be used?

Ans: NVL is a function, which helps the user to substitute a value if null is encountered for an expression.
It can be used as the below syntax.
[NVL (Value_In, Replace_With)]

Q #11) What is the difference between a Primary Key & a Unique Key?

Ans: Primary key is used to identify each table row uniquely, while a Unique Key prevents duplicate values in a table column.
Given below are few differences:

- The primary key cannot hold null value at all while Unique key allows multiple null values.
- The primary key is a clustered index while a unique key is a non-clustered index.

Q #32) What is meant by an index?

Ans: An index is a schema object, which is created to search the data efficiently within the table. Indexes are usually created on certain columns of the table, which are accessed the most.
Indexes can be clustered or non-clustered.

Q #13) How can we find out the current date and time in Oracle?

```
SELECT SYSDATE into CURRENT_DATE from dual;
```

Q #17) What is the quickest way to fetch the data from a table?

Ans: The quickest way to fetch the data would be to use primary key column with index in the SQL Query.

Q #21) What is the use of Aggregate functions in Oracle?

Ans: Aggregate functions perform summary operations on a set of values to provide a single value. There are several aggregate functions that we use in our code to perform calculations.

Few of them are listed below:

- AVG
- MIN
- MAX
- COUNT
- SUM
- STDEV

Q #15) How will you write a query to get a 5th RANK student from a table STUDENT_REPORT?

Ans: The Query will be as follows:

```
SELECT TOP 1 RANK
FROM (SELECT TOP 5 RANK
FROM STUDENT_REPORT
ORDER BY RANK DESC) AS STUDENT
ORDER BY RANK ASC;
```

Q #22) What are the set operators UNION, UNION ALL, MINUS & INTERSECT meant to do?

Ans: Set operator facilitates the user to fetch the data from two or more than two tables at once if the columns and relative data types are same in the source tables.

- UNION operator returns all the rows from both the tables except the duplicate rows.
- UNION ALL returns all the rows from both the tables along with the duplicate rows.
- MINUS returns rows from the first table, which does not exist in the second table.
- INTERSECT returns only the common rows in both the tables.

Q #23) Can we convert a date to char in Oracle and if so, what would be the syntax?

Ans: We can use the TO_CHAR function to do the above conversion.

The syntax will be as follows:

[SELECT to_char (to_date ('30-01-2018′, 'DD-MM-YYYY'), 'YYYY-MM-DD') FROM dual;]

Q #24) What do you mean by a database transaction & what all TCL statements are available in Oracle?

Ans: Transaction occurs when a set of SQL statements are executed in one go. To control the execution of these statements, Oracle has introduced TCL i.e. Transaction Control Statements that use a set of statements.

The set of statements include:

- **COMMIT:** Used to make a transaction permanent.
- **ROLLBACK:** Used to roll back the state of DB to last the commit point.
- **SAVEPOINT:** Helps to specify a transaction point to which rollback can be done later.

Q #25) What do you understand by a database object? Can you list a few of them?

Ans: An object used to store the data or references of the data in a database is known as a Database object.

The database consists of various types of DB objects such as tables, views, indexes, constraints, stored procedures, triggers etc.

Q #27) Can we save images in a database and if yes, how?

Ans: BLOB stands for Binary Large Object, which is a datatype that is generally used to hold images, audio & video files or some binary executables.
This datatype has the capacity of holding data up to 4 GB.

Q #28) What do you understand by database schema and what does it hold?

Ans: Schema is a collection of database objects owned by a database user who can create or manipulate new objects within this schema.
The schema can contain any DB objects like table, view, indexes, clusters, stored procs, functions etc.

Q #30) What is a View and how is it different from a table?

Ans: A view is a user-defined database object that is used to store the results of a SQL query, which can be referenced later. Views do not store this data physically but as a virtual table, hence it can be referred as a logical table.
A table can hold data but not SQL Query results whereas View can save the query results, which can be used in another SQL Query as a whole.

The table can be updated or deleted while Views cannot be done so.

Q #31) What is meant by a deadlock situation?

Ans: Deadlock is a situation when two or more users are simultaneously waiting for the data, which is locked by each other and hence, results in all blocked user sessions.

Q #37) What are the parameters that we can pass through a stored procedure?

Ans: We can pass IN, OUT & INOUT parameters through a stored procedure and they should be defined while declaring the procedure itself.

Q #38) What is a trigger and what are its types?

Ans: A trigger is a stored program which is written in such a way that it gets executed automatically when some event occurs. This event can be any DML or a DDL operation.
PL/SQL supports two types of triggers:

- Row Level
- Statement Level

Q #39) How will you distinguish a global variable with a local variable in PL/SQL?

Ans: Global variable is the one, which is defined at the beginning of the program and survives until the end.
It can be accessed by any methods or procedures within the program, while the access to the local variable is limited to the procedure or method where it is declared.

Q #40) What are the packages in PL SQL?

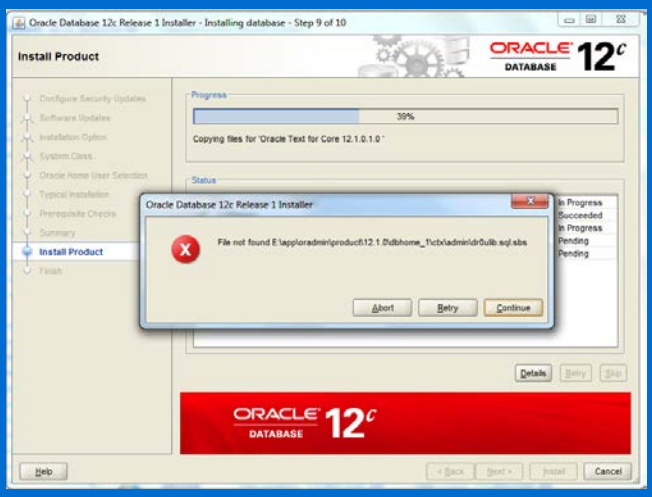
Ans: A Package is a group of related database objects like stored procs, functions, types, triggers, cursors etc. that are stored in Oracle database. It is a kind of library of related objects which can be accessed by multiple applications if permitted.

My Oracle Installation Guide:

winx64_12102_database_1of2
winx64_12102_database_2of2

Fixing missing files in Oracle 12c installation

Oracle 12c has a pretty dumb way of packaging the installer into two zip files along with the instructions of extracting the two zip files into one directory. This is commonly misunderstood as putting ***winx64_12c_database_1of2*** directory and ***winx64_12c_database_2of2*** directory in the one directory say oracle. This is also due to the default setting of the common extraction tools, such as Winzip etc.
However on using this instruction when the installation is started using the ***setup.exe*** the following error is returned:



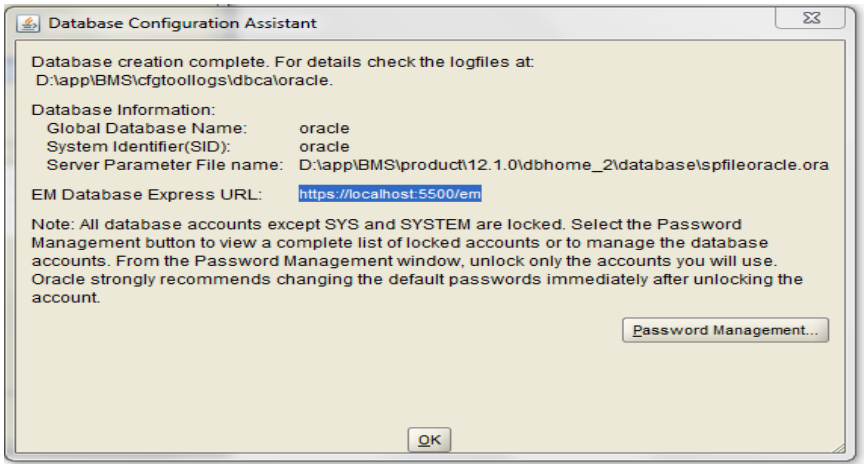
Files, such as ***dr0ulib.sql.sbs*** are reported by the installer as not found. To solve these you need to do the following:

1) Abort the current installer

2) Open the ***winx64_12c_database_2of2*** directory and navigate to ..***\winx64_12c_database_2of2\database\stage\Components*** directory copy all the files

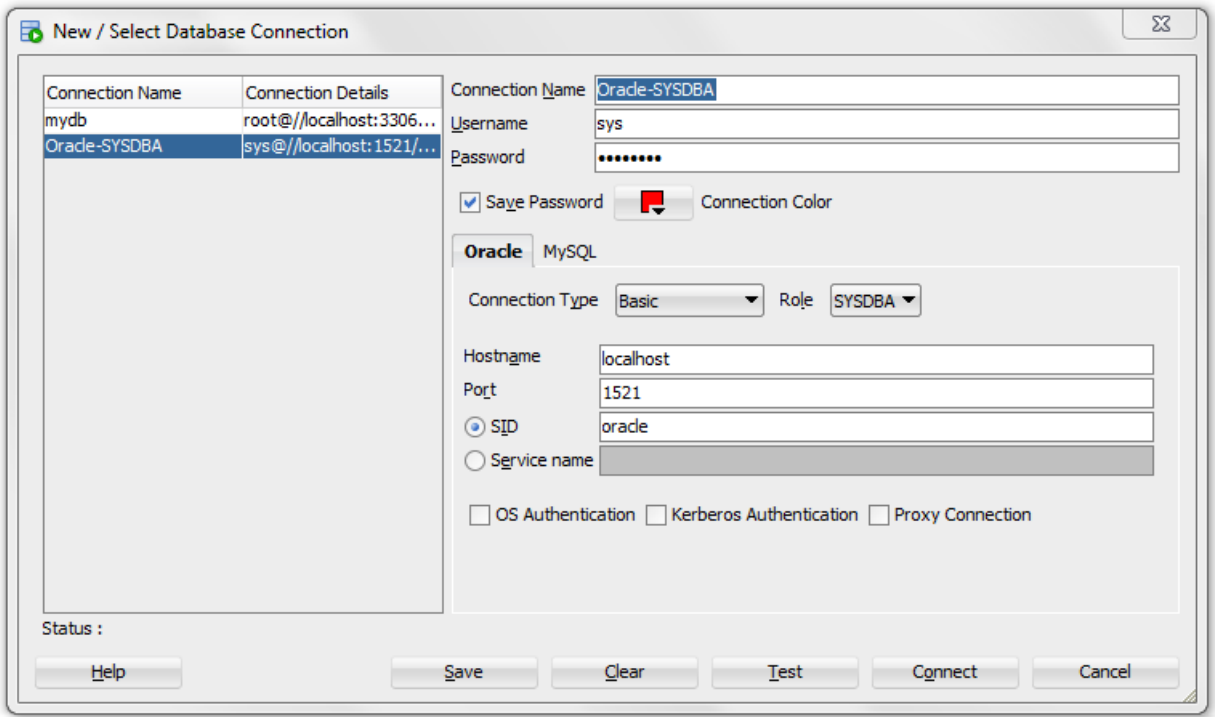
3) Paste all files to the following location ***..\winx64_12c_database_1of2\database\stage\Components***

Now run the ***setup.exe*** as admin and follow the instructions to complete the installation without error.



NOte: Role should be SYSDBA

Username:sys
Password: Asdf1234



TO connect to HR schema

Step 1: Open tnsnames.ora file , you can get in the below path

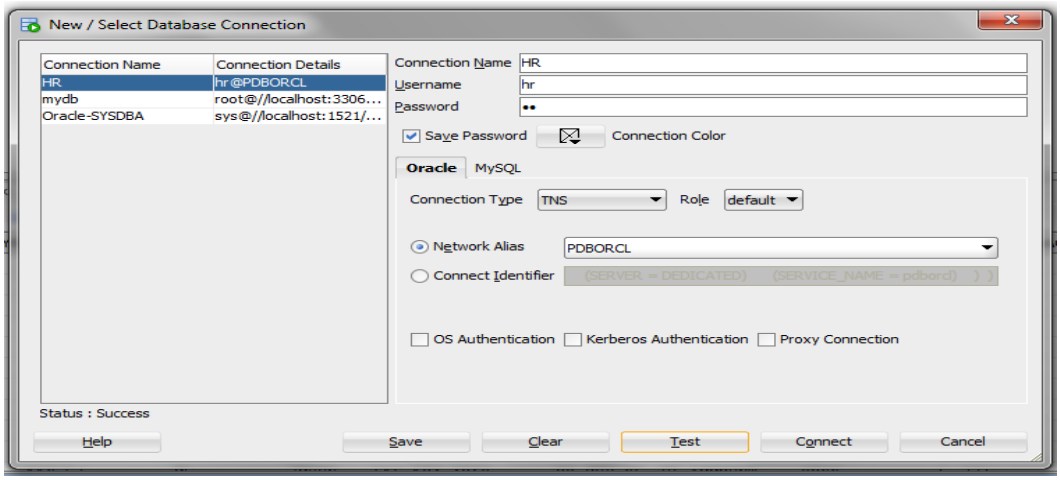
Path: D:\app\BMS\product\12.1.0\dbhome_2\NETWORK\ADMIN\tnsnames.ora

Step 2: Add below line and save it , close it

```
PDBORCL =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP)(HOST = localhost)(PORT = 1521))
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = pdborcl)
    )
  )
```

Step 3: Open CMD as administrator , type this ' lsnrctl reload'
Step 4: sqlplus / as sysdba
Step 5: show con_name
Step 6: alter session set container = pdborcl;
Step 7: select name, open_mode from v$pdbs;
Step 8: alter pluggable database open;
Step 9: alter user hr identified by hr account unlock;
Step 10: conn hr/hr@PDBORCL

Note: Username : hr , Password : hr



After Computer restart you wont be able to connect to HR schema , so do the following steps.
Step 1: Open CMD
Step 2: sqlplus / as sysdba
Step 3: alter session set container = pdborcl;
Step 4: alter pluggable database open;

Now, connect HR schema.

TO create custom user:
https://blogs.oracle.com/sql/how-to-create-users-grant-them-privileges-and-remove-them-in-oracle-database

1. Open CMD,
2. sqlplus
3.type username:system
4.password: DBA password i.e Asdf1234 in your case Password will be different
5. alter session set "_ORACLE_SCRIPT"=true;
6. create user user_name identified by password;
i.e create user **intellect** identified by Asdf1234;

```
// TO give grant by DBA to the user which is created
7. GRANT CONNECT, RESOURCE, DBA TO intellect;
```

Next you'll want to ensure the user has privileges to actually connect to the database and create a session using GRANT CREATE SESSION. We'll also combine that with all privileges using GRANT ANY PRIVILEGES.
8. grant create session grant any privilege to **intellect**;

We also need to ensure our new user has disk space allocated in the system to actually create or modify tables and data, so we'll GRANT TABLESPACE like so:
9. `alter user` **intellect** `quota unlimited on users;`

10. `grant create view, create procedure, create sequence to` **intellect**;

Username:intellect
Password:Asdf1234