**For Exam to learn (3)**

**Question 1.** As a DBA you receive a message from the user **db555** that when he tries to execute SQL command SELECT \* FROM **employees**; he gets an error ORA-00942: table or view does not exist.

(i) Identify at least 3 possible reasons for this problem. [6 marks]

(ii) Describe how you would solve this problem including necessary SQL commands. [12 marks]

**Answer:**

There are several possible causes of this error and possible solutions:

1. The user **tried to execute an SQL statement** that references a **table or view that either does not exist.**

Solution:Check to see if the table exists in Oracle by executing the following SQL statement:

select \* from dba\_objects

where object\_type in ('TABLE','VIEW')

and object\_name LIKE '%**EMPLOYEES**%';

2. The table belongs to another schema and the **user didn't reference the table by the schema name.**

*Solution:* Need to ask the user to rewrite the SQL statement to include the schema name.

In order to know what schema the EMPLOYEES table/view belongs to, following SQL is used to find out:

select owner from dba\_objects

where object\_type in ('TABLE','VIEW')

and object\_name = '**EMPLOYEES**';

User has to use the following SQL:

SELECT \* FROM HR.employees;

3. The user **doesn’t have access to a table specified**.

*Solution:* Need to grant with the appropriate privileges to this object to the user.

GRANT SELECT ON HR.EMPLOYEES TO **db555;**

**Question 2**. Critically evaluate the concepts and tools of the database management system.

Demonstrate systematic knowledge of the database architecture. Design database backup and recovery strategy. Develop critical awareness of issues relating to database management and practical skills to solve common database administration problems.

One of your users is complaining that he cannot login to the database using his username (wr445) and password (wr\_pass) because he receives an error ORA-28000: the account is locked.

(i) Discuss possible reasons for this problem. [5 marks]

(ii) Describe how you would solve this problem including necessary SQL commands.

[10 marks]

Answer.

**(i)** There are several possible reasons for this error:

1. The user account was created but was locked at the creation time.

2. The user exceeded the number of allowed failures during the login and the account was locked automatically.

3. The DBA locked the account explicitly.

**(ii)** In SQL\*Plus connect as the user sys with sysdba role:

SQL>connect as sys/sysdba as sysdba

SQL>ALTER USER **wr445** ACCOUNT UNLOCK;

**Question 3.**

The following PL/SQL code has a total of **5 errors** including syntax errors and logical or execution errors. Identify and correct each error in the code. Provide explanation.

DECLARE

v\_dept\_name VARCHAR2(30):= 'IT';

v\_dept\_id NUMBER;

v\_location VARCHAR2(20):=London;

SELECT MAX(department\_id) INTO v\_max\_deptno FROM departments;

v\_dept\_id = v\_max\_deptno + 10;

INSERT INTO departments (department\_id, department\_name, location)

VALUES (v\_dept\_id,v\_dept\_name,v\_location);

COMMIT;

CREATE TABLE new\_dept

(dept\_num NUMBER, name VARCHAR2(30));

END;

**Answer**

1. v\_location VARCHAR2(20):=London; character data type value ‘**London’ should be inclosed in single quotation marks** as following

**v\_location VARCHAR2(20):=’London’; – syntactic error**

2. **BEGIN reserved word is missing – syntactic error**

3. INTO **v\_max\_deptno - the variable v\_max\_deptno was not been declared and therefore cannot be used – execution error**

4. v\_dept\_id = v\_max\_deptno + 10; sthe assignement operator is := , so it should read

**v\_dept\_id := v\_max\_deptno + 10; - syntactic error**

5. CREATE TABLE new\_dept – **DDL commands are not allowed in PL/SQL block.** It should be replaced with dynamic SQL statement like **EXECUTE IMMEDIATE ‘CREATE TABLE new\_dept**…..’ **- logical error**

**Practice Again //Anonymous PL/SQL Block**

DECLARE

v\_count number;

v\_avg number;

v\_min number;

v\_max number;

BEGIN

SELECT COUNT(employee\_id), ROUND(AVG(salary)), MAX(salary), MIN(salary)

INTO v\_count,v\_avg,v\_max,v\_min

FROM hr.employees;

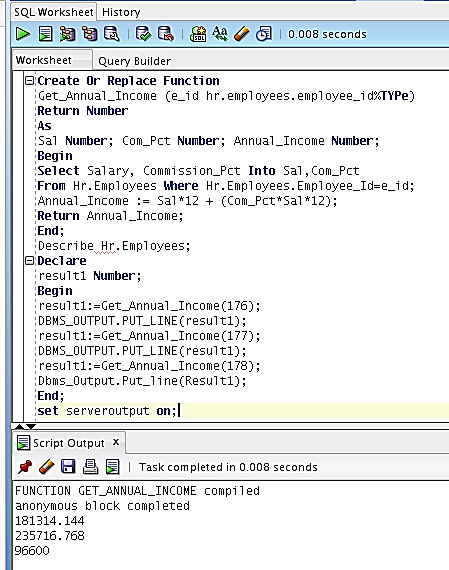
DBMS\_OUTPUT.PUT\_LINE('Today our company has '|| v\_count ||' employees ');

DBMS\_OUTPUT.PUT\_LINE('The average salary in the company is '|| v\_avg);

DBMS\_OUTPUT.PUT\_LINE('The maximum salary in the company is '|| v\_max);

DBMS\_OUTPUT.PUT\_LINE('The manimum salary in the company is '|| v\_min);

**//Practice again PL/SQL Function**



**Testing with PL/SQL Procedure**

**Create or Replace Procedure test\_commission IS**

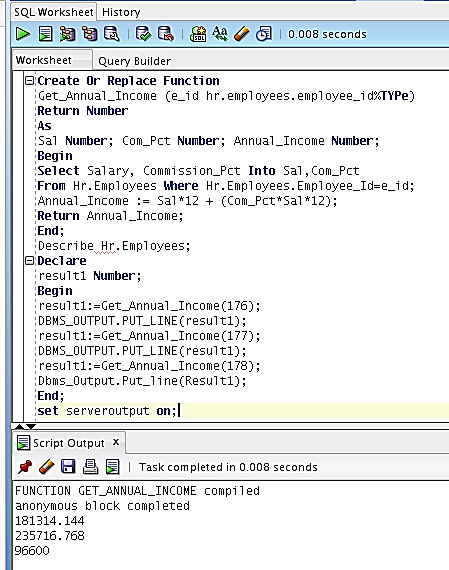
**BEGIN**

**dbms\_output.put\_line( get\_annual\_income (176));**

**dbms\_output.put\_line( get\_annual\_income (177));**

**END;**

**//Testing with anonymous block**



**Testing with SQL query**

**SQL> select get\_annual\_income(176) from dual;**

**True /False Questions and Explanations**

**1.** Table regions has following structure:



The table is empty. You execute the following statements:

INSERT INTO regions VALUES (10,’ASIA’);

INSERT INTO regions VALUES (20,’AMERICA’);

CREATE ROLE inv\_mgr;

UPDATE regions SET region\_name=’AFRICA’ WHERE region\_id=20;

ROLLBACK;

**Which of the following statements are correct about the result? Identify each statement as correct or not and provide an explanation to support your decision. [8 marks]**

**A.** The table regions will remain empty, because of the ROLLBACK.

A. is wrong, because the command ROLLBACK will have affect only on the UPDATE command

**B**. The table regions will have two records:

10 ASIA

20 AFRICA.

B. is wrong, because ROLLBACK will revert changes for ‘AFRICA’

**C**. The table regions will have two records:

10 ASIA

20 AMERICA.

C. is correct, because CREATE ROLE command has implicit COMMIT, so two INSERT commands will be committed

**D**. The role inv\_mgr will not be created.

D. is wrong; CREATE ROLE command has correct syntax, so it will be executed successfully.

**2.** Study following SQL statements: **Identify each statement as correct or not and provide an explanation to support your decision.**

**[8 marks]**

**1.** CREATE TABLE stats (id NUMBER, text VARCHAR2);

Line 1 will cause an error, because column data typeVARCHAR2 requires maximum size.

**2.** ALTER TABLE stats ADD CONSTRAINT id\_pk PRIMARY KEY;

Line 2 will cause an error, because column is not specified for a primary key constraint.

**3.** CREATE USER jsmith IDENTIFIED BY welcome1;

Line 3 will execute successfully.

**4.** GRANT SELECT TABLE TO jsmith;

Line 4 will cause an error since there is no such privilege as SELECT TABLE;

**3.** Only five (5) of the following ten (10) statements are true. Identify each statement as correct or incorrect statement. Explain why the statement is correct or not. If the statement is incorrect restate it correctly.

A. The instance shared memory is system global area (the SGA).

**CORRECT:**

**The Oracle instance consists of a block of shared memory known as SGA, and a number of background processes.**

B. Shutdown normal is the fastest and safe shutdown mode.

**INCORRECT:**

**Shutdown normal is the slowest shutdown mode. Shutdown immediate is the fastest and safe shutdown mode**

C. Creation of user accounts and assigning of privileges are responsibilities carried out by the DBA to ensure database security at data level.

**INCORRECT:**

**Creation of user accounts and assigning of user privileges are system level security responsibilities of the DBA.**

D. You cannot grant object privileges and system privileges and roles to a role.

**INCORRECT:**

**Roles can have any combination of system, object and role privileges.**

E. Tablespaces can be online or offline, read-write or read only.

**CORRECT:**

**Tablespaces can be in any of the above states.**

F. Indexes are used to improve the performance of queries.

**CORRECT:**

**Indexes have two functions: to enforce primary key and unique constraints, and to improve the performance.**

G. A unique constraint will prevent insertion of null values.

**INCORRECT:**

**A unique constraint stops insertion of duplicate values, but will not stop insertion of many null values.**

H. Undo data will always be kept until the transaction that generates it completes with a COMMIT or a ROLLBACK.

**CORRECT:**

**Undo data is the information needed to reverse the effects of DML statements. When transaction starts, Oracle will assign it to one undo segment to keep old data until the transaction completes.**

I. Flashback technology can be used when a logical corruption occurs in a database.

**CORRECT:**

**Flashback features can often reverse the unwanted changes as dropping a table or unwanted transactions. But flashback technologies will not help in case of physical corruption (file corruption).**

J. **SELECT ANY TABLE** is an object privilege.

**INCORRECT:**

**Unlike SELECT ON table\_name which is an object privilege, SELECT ANY TABLE is a system privilege and the grantee will be able to select from any table in the database**.

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**3. Consider following statements about creating constraints: Identify each statement as correct or not and provide an explanation to support your decision**

**A**. Constraints can be created at the same time the table is created.

A. The statement is correct; constraints can be included into CREATE TABLE

Command

**B.** All constraints must be defined at the column level.

B. The statement is incorrect: the constraints can be define on column level or table

Level

**C**. Constraints can be created after the table is created.

C. The statement is correct the constraints can be defined with ALTER TABLE ADD

constraint command.

**D**. Constraint names must start with **SYS\_C.**

D. The statement is incorrect: the constraints can have user defined names or system

defined names.

**E**. The table cannot have two columns with **UNIQUE** constraint.

E. The statement is incorrect: the table can have any number of columns with

UNIQUE constraint.

**F**. **UNIQUE** and **PRIMARY KEY** constraints need an index.

F. The statement is correct: both constraints require an index, so if an index doesn’t

exists on the constrained column(s), it will be created automatically.

**G**. **CHECK** constraint requires a value in the database to comply with a specified condition.

G. The statements is correct. The condition is specified in parenthesis, for example,

CONSTRAINT ord\_chk CHECK (price < 100.00)

**4.** Only **five (5)** of the following **ten (10)** statements are true. Identify each statement as correct or incorrect statement. Explain why the statement is correct or not. If the statement is incorrect restate it correctly.

**A.** One tablespace can have many segments.

C**orrect.**

**A tablespace is a logically a collection of one or more segments and physically a collection of one or more datafile.**

**B.** Static initialisation parameters can be changed without a shutdown/startup.

**Incorrect.**

**Static parameters cannot be changed without a shutdown/startup**

**C.** The online redo logs store recent change vectors applied to the database**.**

**Correct.**

**The redo log stores a continuous chain in chronological order of every change vector applied to the database.**

**D.** A tablespace can consist of only one datafile.

**Incorrect.**

**A tablespace can consist of multiple datafiles.**

**E.** There are three required file types in a database: the controlfile, the online redo log files and the datafiles**.**

**Correct.**

**The database can contain other types of files as well, but three types mentioned above are the mandatory files.**

**F.** Starting up a database is a staged process and the stages are NOMOUNT, MOUNT and OPEN.

**Correct.**

**During the startup process the instance must be started and the database must be mounted and opened.**

**G.** An index can be based on multiple columns of a table, but the columns must be of the same datatype.

**Incorrect.**

**Compound indexes need not be on columns of the same type.**

**H.** A unique constraint will prevent insertion of null values.

**Incorrect.**

**A unique constraint stops insertion of duplicate values, but will**

**not stop insertion of many null values.**

**I.** Preventing the reuse of a password by the same user can be controlled

by a user profile.

**Correct.**

**Setting the limits PASSWORD\_REUSE\_TIME and PASSWORD\_REUSE\_MAX of a user profile can be used to prevent the reuse of a password by the same user.**

**J.** Preventing a user from log on several times concurrently (creating several concurrent sessions) can be achieved by the use of a user profile.

**Correct.**

**Setting up resource limit LIMIT\_SESSIONS\_PER\_USER will achieve this task.**

[20 marks]

**4. Study following SQL statements: Identify each statement as correct or incorrect statement. Explain why the statement is correct or not. Explain what will be achieved by executing the statement. If the statement is incorrect restate it correctly.**

**[14 marks]**

1. ALTER DATABASE OPEN;

1. **Correct**

This is the correct SQL command to open the database after it has been mounted.

2. ALTER USER user1 PROFILE mgr\_profile;

2. **Correct**

This SQL command will assign profile mgr\_profile to the user user1.

3. ALTER TABLE accounts ADD CONSTRAINT id\_uk UNIQUE KEY;

3. **Incorrect**

The column name is missing in the definition of the constraint; the correct SQL would be:

ALTER TABLE accounts ADD CONSTRAINT id\_uk UNIQUE KEY(id);

4. GRANT SELECT ON hr.employees TO user1, user2;

4. **Correct.**

This is a correct SQL command to grant object privilege of selecting from the table employees which belongs to the user hr, to tw ousers user1 and user2.

5. DELETE FROM regions GROUP BY region\_id;

5. **Incorrect.**

You cannot use GROUP BY expression in DELETE command.

The correct statement should be:

DELETE FROM regions;

or DELETE FROM regions WHERE <where condition>;

6. CREATE PROFILE mgr\_profile;

6. **Incorrect.**

In order to create a profile you need to specify at least one resource limit parameter or password parameter as following:

CREATE PROFILE mgr\_profile

LIMIT IDLE\_TIME 10;

7. CREATE INDEX ON employees;

7. **Incorrect.**

In order to create a B-tree index, you need to provide an index name and specify the name of a column(s) in a particular table that will be indexed, as following:

CREATE INDEX emp\_idx ON employees(last\_name);

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//ExtraQ: In the context of the ANSI-SPARC Three-tier Database Architecture, explain the concept of data clearly stating the differences between ***Logical*** and ***Physical*** data independence. Please use some suitable examples in your explanations.

**ANS:**

The ANI-SPARC Three-tier Database Architecture consists of three tiers namely **External views**, for which you can have many of them, **one Conceptual view and one Internal view**.

There are two types of data independence namely, logical and physical.

**Logical data independence** means that users are shielded from changes in the logical structure (conceptual view changes) of the data (i.e. changes in the choice of relations), while physical data independence insulates users from changes in the physical storage (internal view changes) of the data.

*Consider the relation Employees(ename, dept, salary). If this relation is replaced by two relations DetpEmployees(ename, dept) and empSalary(ename, salary) for some reason, then the application programs that operate on the Employees relation can be shielded from this change by defining a view Employeesview(ename, dept, salary) alias Employees. This means that the application programs that refer to Employees need not be changed when the relation Employees is replaced by the other two relations.*