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WINTER – 15 EXAMINATION
<u>Model Answer</u>

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Marks

1. (A) Attempt any six of the following: **12**

a)   **List any four advantages of DBMS.**
        (Any Four advantages – ½ Mark)

Ans:

   Advantages of DBMS:
   - Reduction in Redundancy
   - Avoiding Inconsistency
   - Maintaining Integrity
   - Sharing of data.
   - Enforcement of Security.
   - Transaction support

b)   **What is domain and entity?**
        (Definition of Domain – 1 Mark; Definition of Entity – 1 Mark)

Ans:

   Domain: All permissible values of attributes is called as a domain.
   Entity: An entity is a thing or object in the real world with an independent existence. An entity may be an object with a physical existence.

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c)   **What is meant by database normalization?**
(Database Normalization – 2 Marks)

Ans:

Normalization can be defined as process of decomposition of database tables to avoid the data redundancy.

d)   **What statement is used in PL/SQL to display the output?**
(Correct statement – 2 Marks)

Ans:

   dbms_output.put_line(var/msg);
   OR
   set serveroutput on;
   dbms_output.put_line(var/msg);

e)   **What is data redundancy?**
(Data Redundancy – 2 Marks)

Ans:

Data redundancy means storing same data multiple times at different locations.

f)   **Explain the use of truncate statement. Give example.**
(Description – 1 Mark; Example 1 Mark)
Ans:

TRUNCATE TABLE removes all rows from a table, but the table structure and its columns, constraints, indexes, and so on remain.
Example:
TRUNCATE TABLE STUDENT;

g)   **What is Cursor?**
(Cursor Description – 2 Marks)
Ans:

 Oracle creates a memory area, known as context area, for processing an SQL statement, which contains all information needed for processing the statement, for example, number of rows processed, etc.

h)   **What do you mean by database security?**
(Database Security – 2 Marks; any relevant description shall be considered)

Ans:

Database security refers to the collective measures used to protect and secure a database or database management software from illegitimate use and malicious threats and attacks.

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Database security covers and enforces security on all aspects and components of databases like Data stored in database,Database server,DBMS.

(B)   **Attempt any two of the following:**   **8**

  a) **Explain three tier architecture with suitable diagram.**

   (Diagram – 2 Marks, Description – 2 Marks)

Ans:

In three tier architecture the communication taken place from client to application server and then application server to database system to access the data. The application server or web server is sometimes called middle layer or intermediate layer. The middle layer which processes applications and database server processes the queries. This type of communication system is used in the large applications or the world web applications. On WWW all clients requests for data and server serves it. There are multiple servers used like fax server, proxy server, mail server etc.
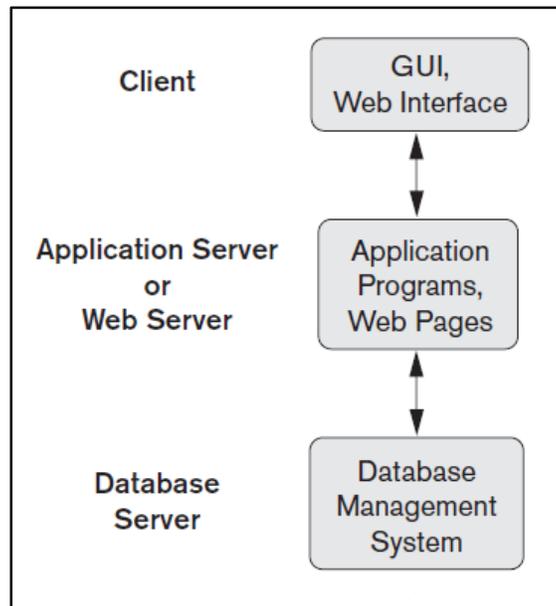
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b)   **Consider the structure of student (Name, Mark, Age, Place, Phone, Birthdate). Write SQL quries for the following:**

   i.   **To list name of student who do not have phone number**

   ii.   **To list students from Mumbai and Pune.**

   iii.   **To change mark of 'Ajay' to 88 instead of 80.**

   iv.   **To list the students whose age is more than 12.**

(Correct query – 1 Mark each)

Ans:

   i). **To list name of student who do not have phone number.**
   Select name from student where Phone is NULL

   ii). **To list student from Mumbai and Pune.**
    select name from student where Place = 'Mumbai' or Place = 'Pune';
    OR
   Select name from student where Place in('Mumbai','Pune');

   iii). **To change mark of 'Ajay' to 88 instead of 80.**
   update student set Mark = 88 where Name = 'Ajay';

   iv). **To list the student whose age is more than 12.**
   select * from student where Age >12;

c)   **Describe exception handling in brief.**

(Description of exception – 2 Marks; syntax – 2 Marks)

Ans:

Exception is nothing but an error. When the system throws a warning or has an error it can lead to an exception. Such exception needs to be handled and can be defined internally or user defined. Exception handling is nothing but a code block in memory that will attempt to resolve current error condition.

Syntax:
DECLARE
        ; Declaration section

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…executable statement;

EXCEPTION
WHEN ex_name1 THEN
        ; Error handling statements/user defined action to be carried out;
END;

2.   **Attempt any four of the following:**   **16**

a)   **Explain any four integrity constraints.**

(Any 4 Integrity constraint – 1 Mark each)
*[** Note: Either syntax or example can be considered]*

Ans:

1). Not Null: By default all columns in tables allows null values. When a NOT NULL constraint is enforced on column or set of columns it will not allow null values.
Syntax for NOT NULL
CREATE TABLE TABLE_NAME
(COLUMN_NAME DATA_TYPE, COLUMN_NAME DATA_TYPE NOT NULL);
Example:
SQL>CREATE TABLE STUDENT (ROLL_NO NUMBER(5), NAME VARCHAR2(20) NOT NULL);

2). CHECK: The constraint defines a condition that each row must satisfy. A single column can have multiple check condition.
Syntax:-
CREATE TABLE TABLE_NAME
(COLUMN_NAME DATA_TYPE,
COLUMN_NAME   DATA_TYPE   *CONSTRAINT   CONSTRAINT_NAME   CHECK*
<CONDITION>);
Example:
SQL> CREATE TABLE EMP
(ID NUMBER(5),
 NAME VARCHAR2(10),
 SAL NUMBER(10) CONSTRINT CHK_SAL CHECK (SAL>15000));

3). Primary Key constraint: It is use to avoid redundant/duplicate value entry within the row of specified column in table. It restricts null values too.
Syntax:
CREATE TABLE TABLE_NAME

_____

(COLUMN_NAME DATA_TYPE,

COLUMN_NAME DATA_TYPE *CONSTRAINT CONSTRAINT_NAME PRIMARY KEY*);

Example:
SQL> CREATE TABLE EMP
(ID NUMBER (5)***CONSTRAINT ID_PK PRIMARY KEY***,
NAME VARCHAR2 (10),
 SAL NUMBER (10));

4). Unique Constraint: The UNIQUE constraint uniquely identifies each record in a database table. The UNIQUE and PRIMARY KEY constraints both provide a guarantee for uniqueness for a column or set of columns.
Syntax:
CREATE TABLE TABLE_NAME
 (COLUMN_NAME DATA_TYPE,
 COLUMN_NAME DATA_TYPE CONSTRAINT CONSTRAINT_NAME UNIQUE);

Example:
CREATE TABLE PERSONS
(P_ID NUM CONSTRAINT P_UK UNIQUE ,
FIRSTNAME VARCHAR(20),
CITY VARCHAR(20));

5). Referential Integrity Constraint: It is a relational database concept in which multiple tables share a relationship based on the data stored in the tables, and that relationship must remain consistent. A value of foreign key is derived from primary key which is defined in parent table.
Syntax:
CREATE TABLE TABLE_NAME
(COLUMN_NAME DATA_TYPE,
COLUMN_NAME DATA_TYPE CONSTRAINT CONSTRAINT_NAME REFERENCES PARENT_TABLE_NAME (PARENT_TABLE_COL_NAME ON DELETE CASCADE,
COLUMN_NAME DATA_TYPE);
Example:
    CREATE TABLE DEPARTMENT (EMP_ID NUMBER(5) REFERENCES EMP(EMP_ID),
DNO NUMBER(3));

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b)   **Describe enhanced E-K model with the help of example.**

   (Description – 2 Marks, Diagram - 2 Marks)

   [**NOTE: Assuming question as Enhanced E-R Model]

Ans:

   The enhanced entity-relationship model is a high level or conceptual data model incorporating extensions to the original Entity – Relationship model (E-R) model, used in design of database
   EER model includes all modeling concepts of the ER model. In addition, EER includes: **Subclasses and superclasses, specialization and generalization.**

Generalization
   Generalization is a bottom-up approach in which two lower level entities combine to form a higher level entity. In generalization, the higher level entity can also combine with other lower level entity to make further higher level entity.

Specialization
   Specialization is opposite to Generalization. It is a top-down approach in which one higher level entity can be broken down into two lower level entity. In specialization, some higher level entities may not have lower-level entity sets at all.
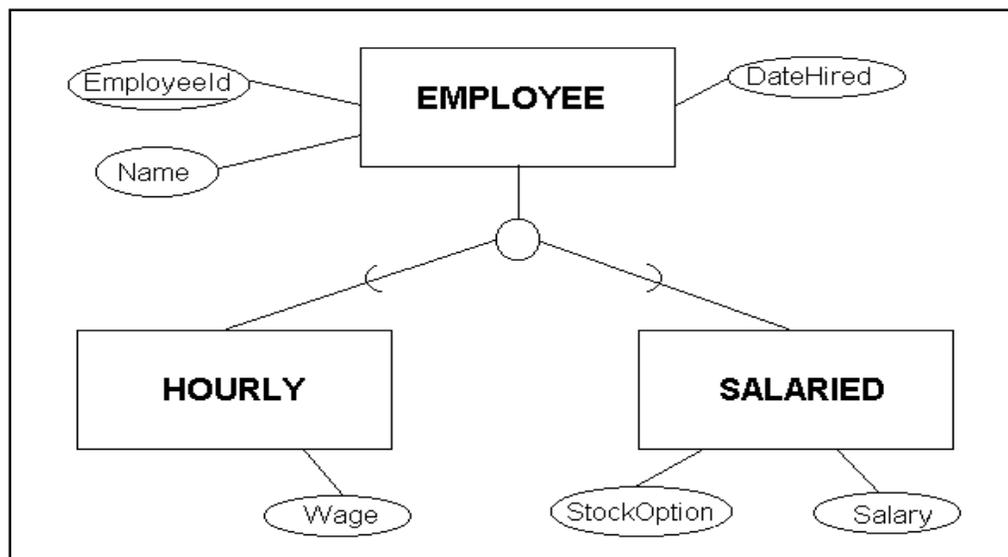
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c)   **Describe how to delete the data from table with an example.**

(Description - 2 Marks; Syntax - 1 Mark; Example - 1 Mark)

Ans:

The SQL DELETE Query is used to delete the existing records from a table. You can use WHERE clause with DELETE query to delete selected rows, otherwise all the records would be deleted.

Syntax:
DELETE FROM table_name
WHERE [condition];
You can combine multiple conditions using AND or OR operators.
Example:
1) To Delete record from customer table with Name as JACK
    DELETE FROM CUSTOMERS WHERE NAME = 'JACK';

2) To Delete all data from table one can use following query;
    DELETE FROM CUSTOMER;

d)   **Explain sequences with example.**

(Definition of sequence - 1 Mark, syntax – 2 Marks, Example - 1 Mark)

Ans:

Definition
A sequence refers to a database object that is capable of generating unique and sequential integer values.
Syntax:
Create sequence <seq_name> [increment by num] [start with num] [maxvalue num] [minvalue num][cycle/nocycle][cache num/nocache];

Where,
Increment by num: Used to specify the interval between sequence numbers.
Start with num: States the first sequence numbers that needs to be generated.
Minvalue num: This is used to state the minimum value of the sequence.
Maxvalue num :It states the maximum value generated by sequence.
Cycle: Cycle indicates that the sequence will be continued for generating the values from the starting after reaching either its maximum value or minimum value.

Cache: The cache option is used to pre-allocates a set of sequence numbers and keep these numbers in the memory so that they can be accessed.

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No Cache: This states that there is no pre-allocation for the values of sequence.
Example:
Create sequence student_seq increment by 1 start with 1 maxvalue 60 nocycle;

e)   **Explain implicit and explicit locking strategy.**

(Implicit Locking Strategy - 1 Mark; Explicit Locking Strategy - 3 Marks)

Ans:

Implicit Locking:
Implicit locks are generally placed by the DBMS automatically.
Explicit Locking:
The technique of lock taken on a table or its resources by a user is called Explicit Locking.
Users can lock tables they own or any tables on which they have been granted table privileges (such as select, insert, update, delete). Explicit locking done by two ways as

1) The Select........For Update statement
It is used for acquiring exclusive row level locks in anticipation of performing updates on records.

2) Using lock table statement:
To manually override Oracle's default locking strategy by creating a data lock in a specific mode.
Syntax:

LOCK TABLE <TableName> [, <TableName>]…
IN { ROW SHARE| ROW EXCLUSIVE|SHARE UPDATE|SHARE|SHARE ROW EXCLUSIVE|EXCLUSIVE}
[NOWAIT]

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f)   Compare DBMS and RDBMS (any four points).

(Any four points - 1 Mark each)

Ans:

DBMS	RDBMS
Old version of software to handle the databases.	Latest version of software for handling databases.
Can relate one table to another table.	RDBMS can relate one database to another database.
Data security is low as compare to RDBMS.	Level of data security is very high as compare to DBMS.
Data storage capacity is less as compare to RDBMS.	Data storage capacity is very high.
Not easy to maintain data integrity.	Data integrity is one of the most important features of RDBMS. It can be maintained easily in RDBMS.
Works better in single user or few user systems.	Works very efficiently and give good performance over the network.
All Codd's 12 rules are not followed.	All Codd's 12 rules are followed.
DBMS normalization process will not be present.	RDBMS fully support normalization
e.g. FoxPro,Ms-Access	e.g SQL-server, Oracle,IBM-DB2

3.   Attempt any four of the following: 16

a)   Write PL/SQL program to print even or odd numbers from given range. (Accept number from user.)

(Correct logic - 2 Marks, correct syntax – 2 Marks)
[Note: Any relevant logic can be considered]**

Ans:

<u>**Logic 1 :**</u>
Declare
n1 number := &n1;
n2 number :=&n2;
i number ;
begin

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```
dbms_output.put_line('Even numbers are :');
 for  i in n1..n2
  loop
      if mod(i,2)=0 then
       dbms_output.put_line(i);
      end if;
    end loop;
dbms_output.put_line('Odd numbers are :');
for  i in n1..n2
  loop
      if mod(i,2)!=0 then
       dbms_output.put_line(i);
      end if;
    end loop;
  end;
```

<u>Logic 2 :</u>

```
Declare
n1 number := &n1;
n2 number :=&n2;
i number ;
begin
for  i in n1..n2
  loop
      if mod(i,2)=0 then
       dbms_output.put_line('Even :' || i);
      else
       dbms_output.put_line('Odd :' || i);
      end if;
    end loop;
  end;
```

b)   Explain conditional control structure in PL/SQL.

(Explanation of each structure - 1 Mark, syntax of each - 1 Mark)

Ans:

Conditional control statements in PL/SQL:

1. If then Else End if statement:
 PL/SQL provide 'if' statement to check conditions in program. If the given condition is true, then the part after If statement gets executed, otherwise, part below else gets executed.

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Syntax:
      If <condition> then
            <action>
      Else
            <action>
      End if;

2. Case
Evaluates a list of conditions and returns one of multiple possible result expressions.
CASE can be used in any statement or clause that allows a valid expression
Syntax:
                  CASE [expression]
                        WHEN condition_1 THEN result_1
                        WHEN condition_2 THEN result_2
                        ...
                        WHEN condition_n THEN result_n
                  ELSE result
                  END CASE;

c)   **Describe functional dependencies with example.**

      (Explanation of functional dependency – 2 Marks, Example – 2 Marks)

Ans:

      Functional Dependency:
      A functional dependency occurs when one attribute in a relation uniquely determine
      another attribute.
      OR
      Let 'R' be a relation and let X and Y be any arbitrary attributes of R, then it can be said that Y is
      functionally dependent on X if and only if, each X value is associated with precisely one Y value.
      And it can be shown as $X \longrightarrow Y$.
      e.g. emp_id $\longrightarrow$ ename   meaning ename functionally dependent on emp_id

Emp_id	Ename
101	Abc
102	Pqr
103	Xyz
104	Abc

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In the sense that for every ename there exists a unique emp_id.

d)   **Explain views with example.**

(Explanation of view with syntax – 3 Marks, Example - 1 Mark)

Ans:

Views are created for security reasons. Instead of coping same table multiple times for different requirements, views can be created. View is a logical copy of physical table. It doesn't exist physically. With the help of view, we can give restricted access to users. When view is used, underlying table is invisible, thus increasing security. Views can be used to see, insert, update and delete data from base table.

Syntax for creating view:-

Create [OR Replace][Force /Noforce] view

<viewname>[alias name ….]

As subquery

[with CHECK OPTION[CONSTRAINT]]

[with READ ONLY];

Example :
Create view emp_info as select Emp_no, Emp_name from Employee where salary>12000;
        To describe content of view
                Select * from emp_info;
        To describe structure of view
                describe emp_info;

e)   **What is lock based protocol? Explain share and exclusive mode protocols in lock based protocol.**

(Lock based protocol explanation – 2 Marks, shared and exclusive lock explanation – 2 Marks)

Ans:

Two phase locking protocol:
This protocol is for ensuring serializability.
It requires the locking and unlocking of the transaction to be done in two phases.
1) **Growing phase:** In this phase, a transaction may obtain locks, but may not release locks.

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2) **Shrinking phase:** In this phase, a transaction may release locks, but may not acquire any new locks.

The two commonly used locks are 1) shared and 2) Exclusive

1) **Shared lock:** It can lock the transaction only for reading.

2) **Exclusive Lock:** It can lock the transaction for reading as well as writing.

The compatibility table for these two locks can be given as:

Lock	Shared	Exclusive
Shared	Compatible	Not compatible
Exclusive	Not compatible	Not compatible

f)   What are data independence? What are its types?

(Definition of data independence - 1 Mark, list of types - 1 Mark, definition of each type - 1 Mark each)

Ans:

Data Independence: It is the ability to modify a schema in one level without affecting schema in another level.
There are two types of data independence:
1) Logical data independence
2) Physical data independence.
Logical data independence: It is the ability to change conceptual schema without affecting external schema or application programs.
Physical data independence: It is the ability to change internal schema without affecting conceptual or external schema.

4.   (A) Attempt any four of the following: 16

a)   Define the term.

> **(i) Candidate key**
>
> **(ii) Primary key**

(Candidate key definition – 2 Marks, Primary key Definition – 2 Marks)

Ans:

Candidate key:
In a relation, there may be a primary key or may not, but there may be a key or combination of keys which uniquely identify the record. Such a key is called as Candidate key.

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Primary key:
A key which is selected by the designer to uniquely identify the entity is called as Primary key. **A primary key cannot contain duplicate values and it can never contain null values inside it.**

b)   **What are adv.of PL/SQL?**

(Any four advantages – 1 Mark each)

Ans:

Advantages of PL/SQL:
1. PL/SQL is that development tool which not only supports SQL data manipulations but also provides facilities of conditional checking and looping.
2. PL/SQL sends an entire block of SQL statement to the ORACLE engine all in one go.
3. PL/SQL also permits dealing with errors as required, and facilitates displaying user friendly messages, when errors are encountered.
4. PL/SQL allows declaration and use of variables in blocks of code. These variables can be used to store intermediate results of a query for later processing, or calculate values and insert them into an ORACLE table later. PL/SQL variables can be used anywhere, either in SQL statements or in PL/SQL blocks.
5. Applications written in PL/SQL are portable to any computer hardware and operating system, where Oracle is operational.

c)   **Explain the select clause in SQL with suitable example.**

(Use of select statement – 1 Mark, Syntax of Select statement -2 Marks, Any relevant Example - 1 Mark)

Ans:

Select statement is used to display data from table.

Syntax:
Select [distinct] <*/column list>
from <tablename>
[where <condition>]
[group by <column name>]
 [order by <column name> asc/desc];

Distinct- can be used to eliminate duplicate values from given attribute.
Eg: select distinct deptno from emp;
      Where – this clause can be used when a condition satisfying records are to be displayed.
Eg: select * from emp where salary> 50000;
      Group by – this clause is used to group records on values of certain attribute.
Eg: select count(*) from emp group by deptno;

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Order by – it is used to arrange records in ascending or descending order.
Eg: select * form emp order by salary desc;

d)   **Write PL/SQL program to display factorial of any number.**
           (Correct logic – 2 Marks, correct syntax – 2 Marks)
           [Note: Any other relevant logic can be considered]**

Ans:

```
declare
    f number :=1;
     n number := &n;
begin
    for i in 1..n
    loop
    f  := f * i;
    end loop;
    dbms_output.put_line(f);
end;
```

e)   **Explain snapshot with example.**

           (Explanation of snapshot – 3 Marks, example – 1 Mark)

Ans:

Snapshot:
- It is also known as materialized view.
- It is a copy of either an entire single table or set of its rows or collection of tables, views or rows using join, grouping and selection criteria.
- Useful in distributed environment

It has two types:
Simple snapshot and complex snapshot. Simple snapshot related to single table and complex snapshot related to joined tables.

Example:
Snapshot for emp table:
Create snapshot emp_data refresh with rowid as select * from emp;

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f) **Explain the overall structure of DBMS with suitable diagram.**

(Explanation- 2 Marks, Diagram – 2 Marks)

Ans:
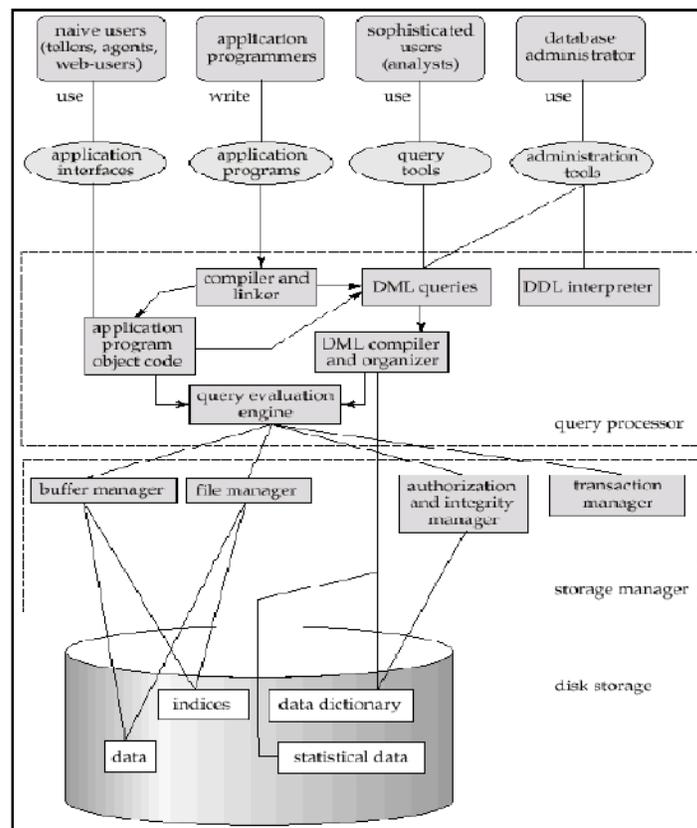
Components of DBMS structure are classified in 3 categories as:

1. **Query processor :**
- **Embedded DML pre compiler:** It converts DML statements embedded in application program to normal procedural calls in host language.
- **DML Compiler:** It translates DML statements of high level language into low level instruction that a query evaluation engine understands.
- **DDL interpreter:** It interprets DDL statements and records them in a set of tables containing metadata.
- **Query evaluation Engine:** It executes low level instructions generated by DML compiler and DDL interpreter.

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2. **Storage Manager Components :**

- **Transaction manager:** It ensures that the database remains in consistenet state despite of the system failure and that concurrent transaction execution proceeds without conflicting.
- **File Manager:** It manages the allocation of space on disk storage and data structures used to represent information stored on disk.
- **Buffer Manager:** It is responsible for fetching data from disk storage into main memory and deciding what data to cache memory.

3. **Disk storage :**
- Data files: It stores the database.
- Data Dictionary: It stores metadata that hold particular values.
- Indices: Provide fast access to data items that hold particular values.

Statistical data : It stores statistical information about the data in the database. This information is used by query processor to select efficient ways to execute query.

5.   **Attempt any four of the following:**   **16**

a)   **Explain different applications of DBMS.**

         (Any four relevant applications – 1 Mark each)

Ans:

 <u>Airlines and Railways</u>**:** Online database for reservation, displaying the schedule information.

<u>Banking</u>**:** Customer inuiry, accounts, loans, and other transactions.

<u>Education</u>**:** Course registration, result, and other information.

<u>Telecommunications</u>**:** Communication network, telephone numbers, record of calls, for generating monthly bills, etc.

<u>E-commerce</u>**:** Business activity such as online shopping, booking of holiday package, consulting a doctor, etc.

<u>Human resources</u>**:** Organizations use database for storing information about their employees, salaries, benefits,taxes, and for generating salary checks.

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b)   **Explain the concept of indexing with neat diagram.**

(Explanation - 3 Marks, Any relevant Diagram - 1 Mark)

 Ans:

 Index: An index is a schema object that can speed up the retrieval of rows by using pointer. An index provides direct and fast access to rows in a table. Indexes are created explicitly Or automatically. Indexes are used to speed up searches/queries.
Types of Index:

Simple index(Single column): An index created on single column of a table is called a Simple Index.
Unique indexes are used not only for performance, but also for data integrity. A unique index does not allow any duplicate values to be inserted into the table.

Composite (concatenated): Indexes that contain two or more columns from the same table which are useful for enforcing uniqueness in a table column where there's no single column that can uniquely identify a row.
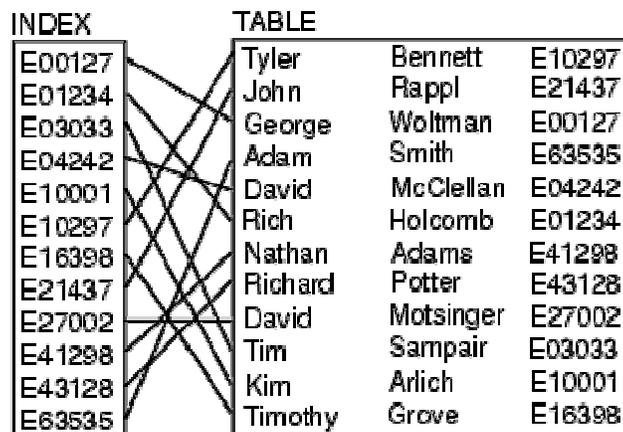
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c)   Explain implicit and explicit cursors.

(Implicit cursor – 2 Marks, Explicit cursor – 2 Marks)

Ans:

Implicit Cursor:
Implicit cursors are automatically created by Oracle whenever an SQL statement is executed, when there is no explicit cursor for the statement.
Whenever a DML statement (INSERT, UPDATE and DELETE) is issued, an implicit cursor is associated with this statement. For INSERT operations, the cursor holds the data that needs to be inserted. For UPDATE and DELETE operations, the cursor identifies the rows that would be affected.
In PL/SQL, you can refer to the most recent implicit cursor as the **SQL cursor**, which always has the attributes like %FOUND, %ISOPEN, %NOTFOUND, and %ROWCOUNT. The following   table provides the description of the most used attributes

•   **Explicit cursor:**
Explicit cursors are programmer defined cursors for gaining more control over the **context area**. An explicit cursor should be defined in the declaration section of the PL/SQL Block. It is created on a SELECT Statement which returns more than one row.
Working with an explicit cursor involves four steps:

•   Declaring the cursor for initializing in the memory
        Cursor cursor_name IS select_statement;

•   Opening the cursor for allocating memory
        Open cursorname;

•   Fetching the cursor for retrieving data
        Fetch cursorname INTO variable1,variable2…

•   Closing the cursor to release allocated memory
        Close cursorname;

d)   Explain parameterized cursor with example.

(Explanation - 2 Marks, Any relevant Example - 2 Marks)

Ans:

PL/SQL Parameterized cursor pass the parameters into a cursor and use them in to query.

PL/SQL Parameterized cursor define only datatype of parameter and not need to define it's length.

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Default values is assigned to the Cursor parameters and scope of the parameters are locally.

Parameterized cursors are also saying static cursors that can passed parameter value when cursor are opened.

Syntax to declare parameterized cursor:

CURSOR CursorName(VariableName Datatype)IS<SELECT statement…>

Opening A parameterized Cursor And Passing Values to the Cursor

OPEN CursorName(Value / Variable / Expression);

Example

Cursor display employee information from emp_information table whose emp_no is four (4).

```
DECLARE
    cursor c(no number) is select * from emp_information
    where emp_no = no;
    tmp emp_information%rowtype;
BEGIN
    OPEN c(4);
    FOR tmp IN c(4) LOOP
    dbms_output.put_line('EMP_No:    '||tmp.emp_no);
    dbms_output.put_line('EMP_Name:  '||tmp.emp_name);
    dbms_output.put_line('EMP_Dept:  '||tmp.emp_dept);
    dbms_output.put_line('EMP_Salary:'||tmp.emp_salary);
    END Loop;
CLOSE c;
END;
/
```

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e)   Explain tuple relational calculus with example.
(Description - 3 Marks, example - 1 Mark)

Ans:

Tuple relation calculus:
It is a non procedural calculus. It describes information without giving a specific procedure for obtaining that information. A query in tuple calculus is expressed as

        {t|P(t)} i.e. the set of all tuples (t) such that predicate (P[condition]) is true for 't'.

We use 't[A]' to denote the value of tuple on attribute 'A' & we use 't∈ r' to denote that tuple 't' is in relation 'r'.There are different symbols with specific meaning which can be used to write tuple calculus expression;-

1. ε- belong to

2. ∃-There exits

3. ∀ – for all

4. ¬ – not

5. => implies

6. ^ -and

7. ∨- or

Example:
Find records of employees where salary is more than 20000.
{t|s ε emp(s[salary]>20000)}

f)   Explain the set operator with help of example.

(Each operator - 1 Mark)

Ans:

Set operators combine the results of two component queries into a single result. Queries containing set operators are called as compound queries. Set operators in SQL are represented with following special keywords as: Union, Union all, intersection & minus.
Consider data from two tables emp1 and emp2 as

emp1	emp2
ename	ename
abc	pqr
xyz	xyz

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lmn

1) **Union** : The Union of 2 or more sets contains all elements, which are present in either or both.

   Union works as or.

   Eg select ename from emp1 **union** select ename from emp2;

   The output considering above data is :

   Ename

    abc

   xyz

    lmn

    pqr

2) **Union all** : The Union of 2 or more sets contains all elements, which are present in both, including duplicates.

   Eg select ename from emp1 **union all** select ename from emp2;

   The output considering above data is :

   Ename

    abc

    x yz

    lmn

    pqr

    xyz

3) **Intersect:** The intersection of 2 sets includes elements which are present in both.

   Eg select ename from emp1 **intersect** select ename from emp2;

   The output considering above data is:

   Ename

   xyz

4) **Minus:** The minus of 2 sets includes elements from set1 minus elements of set2.

   Eg select ename from emp1 **minus** select ename from emp2;

   The output considering above data is:

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Ename

abc

lmn

6.   **Attempt any four of the following:**   16

a)   **What is DBMS? Explain its functions.**

(DBMS definition – 1 Mark, explanation of any three function – 1 Mark each (Any other functions of DBMS is considered))

Ans:

DBMS: A database-management system is a collection of interrelated data and a set of programs to access those data.

Database Communication Interfaces: The end-user's requests for database access are transmitted to DBMS in the form of communication messages.

Authorization / Security Management: The DBMS protects the database against unauthorized access, either international or accidental. It furnishes mechanism to ensure that only authorized users an access the database.

Backup and Recovery Management: The DBMS provides mechanisms for backing up data periodically and recovering from different types of failures. This prevents the loss of data.

Concurrency Control Service: Since DBMSs support sharing of data among multiple users, they must provide a mechanism for managing concurrent access to the database. DBMSs ensure that the database kept in consistent state and that integrity of the data is preserved.

Transaction Management: A transaction is a series of database operations, carried out by a

single user or application program, which accesses or changes the contents of the database. Therefore, a DBMS must provide a mechanism to ensure either that all the updates corresponding to a given transaction are made or that none of them is made.

Database Access and Application Programming Interfaces: All DBMS provide interface to enable applications to use DBMS services. They provide data access via Structured Query Language (SQL). The DBMS query language contains two components: (a) a Data Definition Language (DDL) and (b) a Data Manipulation Language (DML).

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Data integrity and consistency: To provide data integrity and data consistency, the dbms uses sophisticated algorithms to ensure that multiple user can access the database concurrently without compromising the integrity of the database.

b) **Explain on delete cascade clause with suitable example.**

(Explanation - 2 Marks, Example – 2 Marks)

Ans:

On delete cascade:

When a relation is created between two tables, it is permissible to delete records in child table, but a vice–versa operation is not allowed. i.e. deleting records from parent table when it is referenced from some other table is not allowed.

On delete cascade clause allows automatic deletion of child records when parent record is deleted.

Eg :
create table Emp (empid number(5), deptno number(5) references dept(deptno) on delete cascade, ename varchar(10));
OR
 Alter table Emp add constraint foreign key emp(deptno) references dept(deptno) on delete cascade;

c) **Explain any four date function with example**

(Any four functions -1 Mark Each)

Ans:

1) Month_between(d1,d2)
where d1 and d2 are dates.
Months_between finds the number of months between d1 and d2. If date d1 is later than d2 the result is positive. If date d1 is earlier than d2 the result is negative.

 Example: Select months_between ('05-MAY-1996', '05-JAN-1996') from dual;

2) add_months(d,n)
where d-date, n-number of months to be added to the date
Return date after adding the number of months specified with the function.

Example: Select add_months(hiredate,2) from emp where empno=7369;

3) next_day(d,char)
where d-date, char-day of week.

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Return the date of the first weekday named 'char' that is later than date 'd'.

Example: Select next_day('01-FEB-2006', 'Wednesday') "next_day" from dual;

4) **Last_day(d)**
Where d-date
Return the last day of the month that contain date 'd'. Used to determine how many days left in a month.
Example: Select last_day(sysdate) "last" from dual;

5) **round(date,[fmt])**
where 'fmt'-format model: Month,Day.Year
Return date rounded to the unit specified by the format model 'fmt'. If the format model 'fmt' is omitted, date is rounded to the nearest date.
Example: Select round(sysdate, 'day') "round_day" from dual;

6) **trunc(date,[fmt])**
where 'fmt'-format model: Month, Day, Year
Return date with the time portion of the day truncated to the unit specified by the format model fmt. If the format model fmt is omitted, date is truncated to the nearest day.
Example: Select trunc(sysdate, 'day') "trunc_day" from dual;

d)   **Explain not null constraints by suitable example.**

(Explanation -2 Marks, Example -2 Mark)

Ans:

Not null constraint: It is a type of Domain integrity constraint. It is used to maintain the value according to user specification. By default columns allows null values. When not null constraint is assigned on a column or set of column, then it will not allow null values.
Syntax:

Create table <tablename>(column1 datatype(size),column2 datatype(size) not null);

Example:

Create table Emp (EmpId number(4),Empname varchar(20) not null);

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e)   **Give block structure of PL/SQL and explain main components.**

(Block structure - 2 Marks, Explanation - 2 Marks)

Ans:

Declare

   Declaration of memory variables

BEGIN (Mandatory)

   SQL executable statements

Exception

   Handling errors

END; (Mandatory)

A block begins with a declarative section where variables are declared. This is followed by a section containing the procedural statements surrounded by BEGIN and END keywords. Each block must have Begin and End statements and may optionally include an exception section to handle errors.

f)   **Explain ACID properties of transaction.**

     (Each property – 1 Mark)

Ans:

   ACID Properties:

   • **Atomicity:** Either all operations of the transaction are reflected properly in the database, or none are.
   • **Consistency:** Execution of a transaction in isolation (that is, with no other transaction executing concurrently) preserves the consistency of the database.
   • **Isolation**. Even though multiple transactions may execute concurrently, the system guarantees that, for every pair of transactions Ti and Tj, it appears to Ti that either Tj finished execution before Ti started, or Tj started execution after Ti finished. Thus, each transaction is unaware of other transactions executing concurrently in the system.
   • **Durability**. After a transaction completes successfully, the changes it has made to the database persist, even if there are system failures.