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Module: Oracle Database administration

Q1. Describe oracle memory structures and background process.

1. System Global Area (SGA): this is a group shared memory structures and control information for one oracle database instance. It comprises several components such as:

- I. Buffer cache for data blocks
- II. Shared pool for SQL and PL/SQL Statement
- III. Redo log buffer for recording changes

2. Program Global Area (PGA): it is a nonshared memory region that contains data and control information exclusively for use by an oracle process.

Background processes: oracle employs various background processes to manage tasks such as recovery, locking, and I/O. there are some important includes:

- I. DBWn(Database Writer): writes modified blocks from the database buffer cache to data files.
- II. LGWR(log writer): writes redo log entries to disk, ensuring transaction durability.
- III. ARCH(Archiver): copies redo log files to archival storage for backup and recovery.

Q2. Describe oracle logical & physical storage structures

In part of logical storage structures, we have the following:

- I. Table: the primary logical storage structure is the table, which represents the stored data.
- II. View: logical view is virtual table based on the result of a SELECT query. It does not store data itself but provides a way to present data from one or more tables in a customized manner.
- III. Index: are logical structures that provide a quick and efficient way to look up data based on values in one or more columns and it increases the performance of data retrieval.
- IV. Cluster: are groups of one or more tables physically stored together.

In a part of Physical storage structure, we have the following:

- I. Datafiles: Datafiles are physical files on the disk that store the actual data for an oracle database.
- II. Tablespaces: are containers for datafiles, providing an abstraction layer between the logical and physical storage
- III. Segments: is a set of extents that corresponds to a specific logical storage structure (eg: table or index)

- IV. Extents: are contiguous blocks of data within a datafiles when segment requires more space it allocated in the form of extents.