### Reg no:22RP08551

### Q 1.MEMORY STRUCTURE AND BACKGROUND PROCESSES

### Memory Structure:

* System Global Area (SGA):
  + SGA is a shared memory region that holds data and control information for an Oracle instance.
  + It consists of several components:
  + Database Buffer Cache: Stores copies of data blocks read from data files to minimize physical I/O.
  + Shared Pool: Contains shared memory areas such as the library cache (SQL statements, parsed execution plans) and the data dictionary cache (metadata).
  + Large Pool (Optional): Used for large memory allocations such as parallel query operations, backup, and recovery.
  + Java Pool (Optional): Stores session-specific Java code and data.
  + Streams Pool (Optional): Used for Oracle Streams, a feature for data replication and integration.
* Program Global Area (PGA):
  + PGA is a private memory region for each Oracle session or process.
  + It includes variables and data structures that are not shared among multiple sessions.
  + It holds session-specific information like bind variables, sort areas, and session-related control structures.

### Background Processes:

* System Monitor Process (SMON):
  + Performs crash recovery when an instance fails.
  + Cleans up temporary segments and frees resources after a transaction aborts.
* Process Monitor Process (PMON):
* Performs process recovery by cleaning up after failed user processes.
* Reclaims resources such as locks and memory held by terminated sessions.
* Database Writer Process (DBWn):
  + Writes modified buffers from the buffer cache to data files.
  + Helps ensure changes are permanently saved to disk.
* Log Writer Process (LGWR):
  + Writes redo log entries from the redo log buffer to the redo log files.
  + Ensures transactional durability and recoverability.
* Checkpoint Process (CKPT):
  + Signals DBWn to write dirty buffers to data files during a checkpoint.
  + Helps ensure recovery time is minimized in the event of an instance failure.
* Archiver Process (ARCn):
  + Copies online redo log files to archival storage (e.g., tape) for backup and recovery purposes.
  + Crucial for maintaining a complete set of redo logs for recovery.
* Listener Process (Listener):
  + Listens for incoming connection requests from clients and establishes network sessions.
  + Routes client requests to the appropriate Oracle instance.
* Dispatcher Processes (Optional - Shared Server Configuration):
  + Handle multiple user connections concurrently in a shared server configuration.
  + Improve resource utilization by sharing server processes among multiple clients.

### Q 2.ORACLE LOGICAL AND PHYSICAL STORAGE

Oracle's logical storage structure includes tablespaces, which are logical storage containers for organizing and separating data within a database. Tables, indexes, and other database objects are stored within tablespaces. The logical structure defines how data is organized and related in the database, providing a conceptual framework for database management.

On the other hand, Oracle's physical storage structure involves the actual storage mechanisms used to store data on the disk. Datafiles are the physical files on the disk that store the actual data for tablespaces. Each tablespace consists of one or more datafiles, and these files are managed by the operating system.

In summary, the logical storage structure (tablespaces, tables, indexes, etc.) provides a high-level organization of data, while the physical storage structure (datafiles) represents the actual storage on the disk where the data resides. These structures work together to manage and access data efficiently within an Oracle database.