Database Administration and Management – BITF21 (Morning)

Solution Key | **Quiz 3** | **Chapters 11 to 15**

1. **Write the difference between following datatypes:** **(10)**

- **CHAR(N), VARCHAR2(N)**
- **CHAR(N), NCHAR(N)**
- **VARCHAR2(N), NVARCHAR2(N)**

CHAR(N) vs. VARCHAR2(N)

- CHAR(N):
  - Fixed length
  - Padded with spaces
  - Suitable for codes, abbreviations
- VARCHAR2(N):
  - Variable length
  - Not padded
  - Suitable for names, descriptions

CHAR(N) vs. NCHAR(N)

- CHAR(N):
  - Uses database character set (ASCII)
  - Limited language support
- NCHAR(N):
  - Uses Unicode character set (UTF-8)
  - Supports multiple languages

VARCHAR2(N) vs. NVARCHAR2(N)

- VARCHAR2(N):
  - Uses database character set (ASCII)
  - Limited language support
- NVARCHAR2(N):
  - Uses Unicode character set (UTF-8)
  - Supports multiple languages

2. List the different types of indexes and their uses. (10)

- Logical
  - Single column
  - Concatenated
  - Unique
  - Non-unique
  - Function-based
  - Domain
  - Benefits: Improves query performance and reduces disk I/O.

- Physical
  - Partitioned or non-partitioned
  - B-tree
    - Normal or reverse key
    - Used to Speed up queries with equality and range conditions
  - Bitmap
    - Used to Improve query performance for low-cardinality columns

3. Describe Data Integrity. Explain various types of Data Integrity Constraints. (10)

Data integrity refers to the accuracy, consistency, and reliability of data stored in a database or information system. It ensures that data is:

1. Accurate: Free from errors and inconsistencies.
2. Consistent: Adheres to defined rules and formats.
3. Reliable: Trustworthy and dependable.
4. Complete: Not missing or incomplete.

Types of Constraints

Constraint	Description
NOT NULL	Specifies that a column cannot contain null values
UNIQUE	Designates a column or combination of columns as unique
PRIMARY KEY	Designates a column or combination of columns as the table's primary key
FOREIGN KEY	Designates a column or combination of columns as the foreign key in a referential integrity constraint
CHECK	Specifies a condition that each row of the table must satisfy

4. **For what purpose these datatypes are used: ROWID, UROWID? Distinguish between an extended versus a restricted ROWID** **(10)**

ROWID and UROWID are data types in Oracle databases:

ROWID:

- Uniquely identifies each row in a table.
- Stores Physical address of a row.
- Length 18 bytes (hexadecimal).

UROWID:

- Stores universal row IDs.
- Stores Logical address of a row.
- Variable Length (up to 4000 bytes).

Extended ROWID:

- 18 bytes long.
- Stores physical address of a row.
- Supports partitioned tables.

Restricted ROWID:

- 6 bytes long (limited address space).
- Not supported for partitioned tables.

Key differences:

- Length: Extended (18 bytes) vs Restricted (6 bytes).
- Partitioning support: Extended (yes) vs Restricted (no).
- Address space: Extended (larger) vs Restricted (limited).

5. **How do you compute PCTFREE and PCTUSED.** **(10)**

$$PCTFREE = \frac{(Average\ Row\ Size - Initial\ Row\ Size) \times 100}{Average\ Row\ Size}$$

$$PCTUSED = 100 - PCTFREE - \frac{Average\ Row\ Size\ \times 100}{Available\ Data\ Space}$$