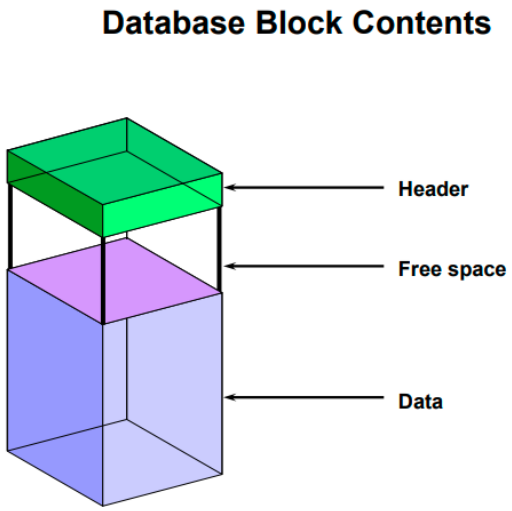
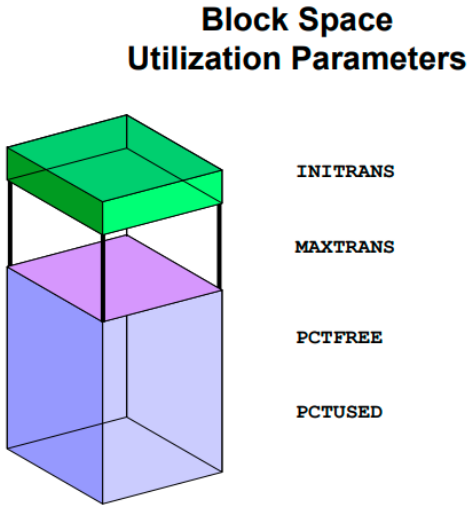
Database Administration and Management – BITF21 (Morning)

Solution Key | **Quiz 1** | **Chapters 1 to 8**

1. Explain how a block works with a diagram. **(10)**

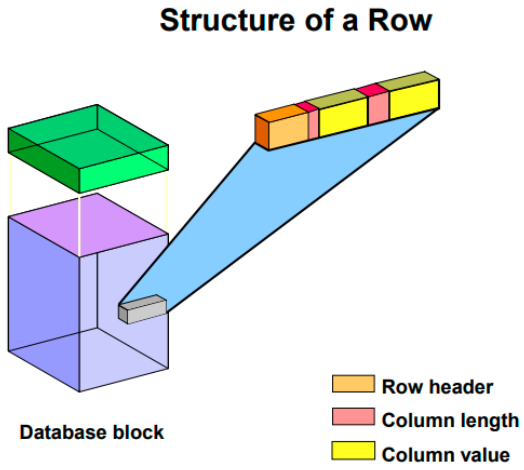
A DB block, short for database block, is the fundamental unit of storage in a database system. It's a fixed-size chunk of memory or disk space that is used to store data. Think of it as a page in a book, where each page can hold a certain amount of information.
Data is divided into records, which are grouped and stored within blocks.
The database system manages the allocation and deallocation of blocks to efficiently store and retrieve data.
To access specific data, the system locates the correct block using indexes and reads its contents into memory.





2. Explain the extended row structure with a diagram. **(15)**

An extended row structure is a database storage mechanism designed to handle rows that exceed the size of a single block. In this structure, a row is divided into multiple blocks. The initial block, known as the in-row block, contains the fixed-size header and a portion of the row data. The remaining data is stored in additional blocks, referred to as overflow blocks. This approach allows for efficient storage of variable-length data, particularly large text fields or binary objects.



3. Comparison of B-Tree index and BIT map Index. **(15)**

B-Tree	Bitmap
Suitable for high-cardinality columns	Suitable for low-cardinality columns
Updates on keys relatively inexpensive	Updates to key columns very expensive
Inefficient for queries using OR predicates	Efficient for queries using OR predicates
Useful for OLTP	Useful for data warehousing

4. Write command to create table with segment setting. **(10)**

```
CREATE TABLE my_table (
    column1 NUMBER(10),
    column2 VARCHAR2(50)
)
PCTFREE 10
PCTUSED 80
STORAGE (NEXT 1M
    MINEXTENTS 1
    MAXEXTENTS 256
);
```

5. What is locally managed tablespace and BMB chart for blocks. Explain in detail. **(10)**

Locally managed tablespace:

- Free extents managed in the tablespace
- Bitmap is used to record free extents
- Each bit corresponds to a block or group of blocks
- Bit value indicates free or used
- Reduced contention on data dictionary tables
- No undo generated when space allocation or deallocation occurs
- No coalescing required

BMB

A BMB (Block Map Bitmap) chart is a graphical representation of the free and used blocks within a data file. It's a useful tool for understanding the physical storage layout of a database.

How BMB Charts Work:

Block Representation: Each block in a data file is represented by a bit in the BMB.

Bit Value: A bit value of 0 indicates a free block, while a bit value of 1 indicates a used block.

Chart Visualization: The BMB is typically visualized as a grid, where each row represents a block and each column represents a bit.