23K-0001
BAI-5A
"DBMS Assignment-1"

Lunar ___ 143
Solar ___ 201

Q1)

(a) Problems with file system data management

(1) Data redundancy & inconsistency: Multiple copies of same data may exist.

(2) Lack of data sharing & isolation: Difficult to access & share data among multiple users.

(3) No data integrity & security: Constraints & rules are hard to enforce.

(4) Poor concurrency control: Multiple users updating data may lead to conflicts.

(5) Difficult data access: Complex Programming is required to retrieve data.

(b) A composite Primary key consists of two or more attributes that together uniquely identify a record.
For example: In a table enrollment (Student ID, Course ID, Grade)

- Student ID alone is not unique (a student can enroll in many courses).
- Course ID alone is not unique (many students can enroll in the same course).
- But (Student ID, Course ID) together uniquely identified each record.

(c) Operations performed by the application program when DBMS is used:
(1) Data definition: creating or modifying database structure (table, schemas).
(2) Data manipulation: Inserting, updating, deleting, & retrieving data.
(3) Transaction Management: Ensuring ACID properties (atomicity, consistency, isolation, durability).
(4) Authorization & Access Control: Managing user permissions.
(5) Error handling & Recovery: Ensuring data consistency in case of failure.

(d) (1) Physical data independence is easier to achieve.
(2) Logical data independence is more difficult because changes in conceptual schema (eg. adding a new field to a table) often require changes in application programs or views.

(e) (1) A superkey is any set of attributes that uniquely identifies a record.
(2) A key is minimal superkey (no extra attribute can be removed & still uniquely identifies records).
(3) For Student (RollNo, Name, Email)
RollNo is a key & superkey.
(RollNo, Name) is a superkey but not a key because Name is unnecessary for unique identification.