MID 1 DB SOLUTION

Question 1:

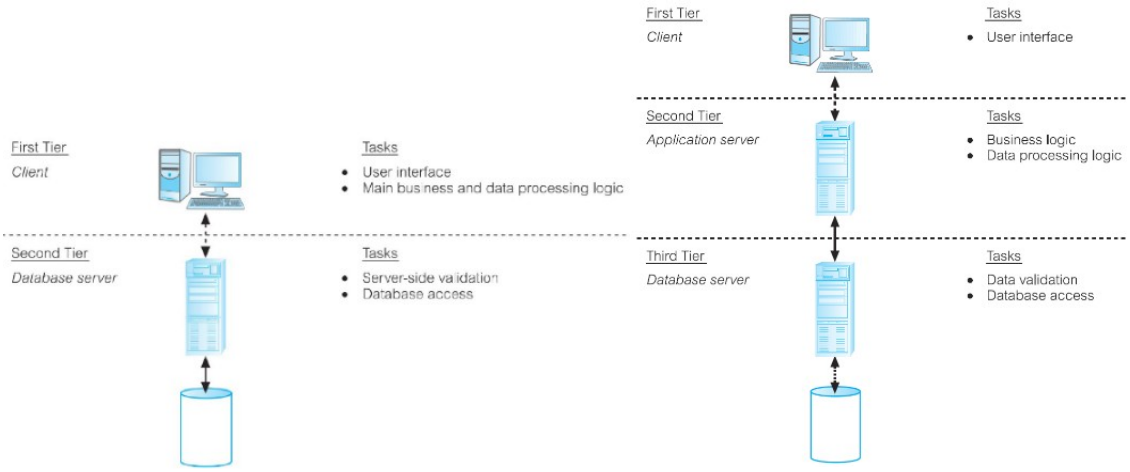
a.
```
Create Table Dancer (
        did             int     PRIMARY KEY,
        name            varchar(20),
        birthyear       int,
        country         varchar(20)
);
Create Table Role (
        did             int     references Dancer,
        sid             int     references Show,
        role            varchar (20),
        company         varchar (20) references Company,
        Primary key (did, sid, role, company)
);
```

b.
```
SELECT      distinct dancer.name, role.company
FROM        role, show, dancer
WHERE       role.sid = show.sid
AND         role.did = dancer.did
AND         role.role = "Black Swan"
AND         show.title = "Swan lake"
ORDER BY    dancer.name;
```

c.
```
SELECT      dancer.did, dance.name
FROM        dancer, role
WHERE       dancer.birthyear <= 1950
AND         dancer.did = role.did
GROUP BY    dancer.did, dancer.name
HAVING  count (DISTINCT role.sid) >=3;
```

d.
```
SELECT      distinct dancer.name, company.name
FROM        dancer, role, company
WHERE       dancer.did = role.did
AND         role.company = company.name
AND         company.country <> dancer.country;
```

Question 2



Question 3:

- **Data:** Data is **raw**, unorganized facts that need to be processed
- **Information:** When data is processed, organized, structured or presented in a given context so as to make it useful, it is called information.
- **Database:** A **database** is a collection of related data.
- **Database Management System:** A software package/ system to facilitate the creation and maintenance of a computerized database.
- **Database System:** The DBMS software together with the data itself. Sometimes, the applications are also included.

MID 1 DB SOLUTION

Question 4:

Cost, domain of application, concurrency, usage and security are the main concerns on which we decide the system to be developed using DBMS or not

As it is already mentioned in the statement that the data of the hand punch machine is only useful till the salary is not being generated. After that they flush the data. In that case we gave priority to a file base system on any DBMS.

Question 5:

Benefits / Advantages of Dbms

1. Controlling Redundancy
2. Restricting Unauthorized Access
3. Providing Persistent Storage for Program Objects
4. Providing Storage Structures and Search Techniques for Efficient Query Processing
5. Providing Backup and Recovery
6. Providing Multiple User Interfaces
7. Representing Complex Relationships among Data
8. Enforcing Integrity Constraints

Demerits/ Limitation of File Based System

1. Separation & Isolation of Data.
2. Duplication of records /data.
3. Data Security Issue.
4. File accessing Issue
5. Fixed Queries.

Question 6:

a. *Alter table Reservation*

Add (GID varchar(10),

Constraint Guest_ID

Foreign Key (GID) References Guest (GID));

b. *Insert into Reservation values(R-123, 1, 2, 29-09-2018, 1, NULL, R-109, G123);*

c.

Key Constraint violation (If primary key already exists)
Entity Integrity Constraint Violation (If primary key is NULL)
Referential Integrity Constraint Violation (If Inserted RID doesn't belong to PK)
Domain Constraint Violation

Question 7

Let $D_1, D_2, \ldots, D_n$ be n sets. Their Cartesian product is defined as:

$$D_1 \times D_2 \times \ldots \times D_n = \{(d_1, d_2, \ldots, d_n) \mid d_1 \in D_1, d_2 \in D_2, \ldots, d_n \in D_n\}$$

Any set of n-tuples from this Cartesian product is a relation on the n sets. Now let $A_1, A_2, \ldots, A_n$ be attributes with domains $D_1, D_2, \ldots, D_n$. Then the set $\{A_1{:}D_1, A_2{:}D_2, \ldots, A_n{:}D_n\}$ is a relation schema. A relation R defined by a relation schema S is a set of mappings from the attribute names to their corresponding domains. Thus, relation R is a set of n-tuples:

$(A_1{:}d_1, A_2{:}d_2, \ldots, A_n{:}d_n)$ such that $d_1 \in D_1, d_2 \in D_2, \ldots, d_n \in D_n$

Each element in the n-tuple consists of an attribute and a value for that attribute.