**Assignment – I**

Part - A

a. Functional Dependencies:

1. {PILOT, DATE}  FLIGHT

2. {DATE, DEPARTS}  PILOT

3. FLIGHT  DEPARTS

4. {FLIGHT, DATE}  PILOT

5. {PILOT, DEPARTS} DATE

6. {PILOT, DATE} DEPARTS

7. {PILOT, FLIGHT} DEPARTS

8. {PILOT, DATE, DEPARTS} FLIGHT

9. {FLIGHT, DATE} DEPARTS

b. Candidate Keys:

1. {DATE, DEPARTS}

2. {FLIGHT, DATE}

3. {PILOT, DATE}

5. {PILOT, FLIGHT, DATE}

6. {PILOT, DATE, DEPARTS}

7. {FLIGHT, DATE, DEPARTS}

8. {DEPARTS, PILOT}

9. {DATE, FLIGHT}

Part – B

ASSUMPTIONS I MADE TO FIND FOREIGN KEYS:

* From the table EMPLOYEES, the attribute “ReportsTo” is directed to the employees’ Senior or Head. This column shows that, there would be a different table which contains all the information of “Senior Manager” or something like that. And it has a primary key “Manager ID”, so that we can uniquely identifies which employee reports to which Manager. Second, there is no Senior Manager table, because Manager is also an employee of an organization. But whatever it is, the attribute “ReportsTo” must be linked with some other data. Hence, I choose “ReportTo” as my foreign key from the EMPLOYEES table.
* I have written my answers to keep this in mind that, “The foreign key name may not match the spelling of the corresponding primary key”.
* Whereas, in the table ORDERS, the attribute “ShipVia” is the “ShipperID” from SHIPPERS table, so, we will able to find which “shipper” will deliver the product to customer.
* In the table ORDER\_DETAILS, both the primary keys are foreign keys. So, it is necessary for the “Order” & “Product” tables to create an attribute named “Bill/Invoice/Financial Statement” and also necessary to keep updated with the changes.

Foreign keys in the schema for Northwind database:

1. **ReportsTo** is foreign key in **EMPLOYEES** table. 🡪 Followed by assumption (a)
2. **ShipVia**, **Customer** and **Employee** are foreign keys in **ORDERS** table. 🡪 Followed by assumption (c)
3. **Supplier** and **Category** are foreign keys in **PRODUCTS** table.
4. **Order** and **Product** are foreign keys in **ORDER\_DETAILS** table. 🡪 Followed by assumption (d)

Part - C

1. Functional dependencies that exist between the columns of the table:
2. DriverID  DriverName
3. ClientID  ClientName
4. DriverName  DriverID
5. DriverName TaxiID
6. DriverID  TaxiID
7. JobPickUpAddress  TaxiID
8. {DriverID , DriverName}  TaxiID
9. Primary Key : **JobID**
10. Candidate Keys :
11. {**TaxiID , JobTime , JobDate**}
12. {**JobDate , JobTime , ClientID**}
13. {**DriverID , JobTime , JobDate**}
14. {**JobDate , JobTime , DriverName**}
15. {**JobDate , JobTime , ClientName**}
16. {**ClientID, JobDate, JobTime**}
17. {**TaxiID, JobDate, JobTime**}
18. {**JobDate, DriverID**}
19. {**JobDate, DriverName**}
20. {**DriverName, JobDate**}