(3 Hours) **[Total Marks: 80]**

N.B. :   (1) Question No. 1 is **compulsory**
          (2) Solve any **three** questions out of remaining **five**

1. (a) Explain View and Give Difference between View and Base Table **5**
    (b) What is Write –Ahead Logging and when it is used? **5**
    (c) Write a short note on SQL Injection. **5**
    (d) Define a lock and describe the types of locks used in concurrency control. **5**

2. (a) Design a schema in SQL for a Library System. Show one example each for **10**
        PRIMARY KEY and FOREIGN KEY constraint. Create one assertion for the
        following Constraint: "No member can borrow more than three books at a time".
    (b) Explain use of SQLJ with two types of iterators available in SQLJ. **10**

3. (a) Describe ARIES recovery algorithm with example. **10**
    (b) Explain Query Processing and Optimization in Distributed database. **10**

4. (a) Explain multilevel indexing with suitable example? **10**
    (b) Explain with suitable example object identity, object structure and type **10**
        constructors in OODB.

5. (a) Explain data warehouse architecture in detail. **10**
    (b) Compare MAC and DAC and RBAC for multi level security. **10**

6. Consider a Dataware house for a hospital where there are three dimensions: **20**
                1) Doctor
                2) Patients.
                3) Time and two measures count and charge.
        Using above example perform following
        a.   Star schema
        b.   Snakeflake schema
        c.   Rollup & drilldown operations
        d.   Pivot operation
        e.   Slice and Dice operations