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

N.B.: (1) Question no. 1 is compulsory.
(2) Attempt any three questions from remaining.
(3) Assume suitable data wherever necessary.

Q1 Attempt the following.

(a) What is difference between weak and strong entity sets? (05)

(b) List four significant differences between file processing system and DBMS. (05)

(c) Explain referential integrity constraints in SQL. (05)

(d) Explain ACID properties of transaction. (05)

Q2(a) Draw ER diagram for bank management system. Transform it into relational model. (10)

Q2(b) What are the types of failure in database system? Explain shadow copy and shadow paging schemes of recovery. (10)

Q3(a) Explain following SQL clauses with syntax and example of each clause: IN, LIKE, ORDER BY and COUNT. (10)

Q3(b) What is normalization? Explain 1NF, 2NF & 3NF with suitable example. (10)

Q4(a) Explain two phased locking protocols in concurrency control. (10)

Q4(b) Explain various joins in SQL with example. (10)

Q5(a) What is a deadlock? Explain different types of deadlock prevention schemes. (10)

Q5(b) Explain four relational algebra operations with example. (10)

Q6 Attempt the following **(any two)** (20)

(a) Database system architecture

(b) Views and triggers in SQL

(c) Generalization-specialization and aggregation

(d) Cost based query optimization

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