

Q.P. Code : 541600

(3 Hours)

Total Marks: 80

- N.B.:** (1) Question No.1 is **compulsory**.
 (2) Solve any **three** questions out of the remaining questions.
 (3) Make **suitable** assumptions if **needed**.

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| 1. (a) Explain BCNF with example. | 5 |
| (b) Write short note on Deadlocks. | 5 |
| (c) Explain Total and Partial Participation. | 5 |
| (d) Discuss the role of Database Administrator. | 5 |
| 2. (a) Discuss steps in query processing. Also describe cost based query optimization. | 10 |
| (b) Draw an ER Diagram and convert it into relational model for a Company, which has several Employees working on different types of Projects. Several Employees are working for one Department, every Department has a Manager. Several Employees are supervised by one Employee. | 10 |
| 3. (a) Explain types of integrity constraints with example. | 10 |
| (b) Discuss Data Definition and Manipulation Commands in SQL. | 10 |
| 4. (a) Describe the overall architecture of DBMS with suitable diagram. | 10 |
| (b) Explain Security and Authorization in DBMS. | 10 |
| 5. (a) Explain the following Relational Algebra Operations with example: | 10 |
| i. Natural Join iii. Generalized Projection | |
| ii. Set Intersection iv. Division Operator | |
| (b) Explain Assertions and Triggers in detail. | 10 |
| 6. Write Short notes on | 20 |
| (a) ACID properties | |
| (b) Shadow Paging | |
| (c) Specialization and Generalization | |
| (d) Aggregate Functions in SQL | |