

| Paper Code: HCSCR4102T | Database Management Systems (Theory) | Marks: 60 |
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| S NO | Topic | No. of Periods |
| Group A | | 27 |
| 1. | Fundamental concepts of DBMS; Purpose of Database Systems; Data Abstraction: Physical, Conceptual and External Levels; Data Models; Database Languages; Database Users; Database Manager; Database Administrator; DBMS Structure. | 9 |
| 2. | Entity Relationship Model: Entity Sets; Relationship Sets; Mapping Constraints; Keys; E R Diagrams; Strong and Weak Entity Sets; Extended ER Features: Specialization/Generalization, Aggregation. | 9 |
| 3. | Relational Model: Structure of Relational Databases; Database Schema; Query Languages: Relational Algebra: Fundamental Operations, Additional Operations; Tuple and Domain Relational Calculus; Structured Query Languages | 9 |
| Group B | | 25 |
| 4. | Database design: Constraints: Domain Constraints; Referential Integrity; Functional Dependencies, Normalization: 1NF, 2NF, 3NF and BCNF | 5 |
| 5. | File Organization: Operations on files, Records: Fixed length, Variable Length, Sequential File Organization, Indexing structures for files (Primary index, secondary index, clustering index), Multilevel indexing using B and B+ trees. Hashing: Hash functions; Static and Dynamic Hashing. | 7 |
| 6. | Transaction Processing: ACID properties, concurrency control | 5 |
| 7. | Introduction to Distributed Databases: Introduction; Comparison with traditional databases; DDBMS Components; Fragmentation, Replication, Allocation. | 8 |
| Total | | 52 |
| Books and References: | | |
| 1. R. Elmasri, S.B. Navathe, Fundamentals of Database Systems 6th Edition, Pearson Education, 2010. | | |
| 2. A. Silberschatz, H.F. Korth, S. Sudarshan, Database System Concepts 6th Edition, McGraw Hill, 2010. | | |
| 3. R. Ramakrishnan, J. Gehrke, Database Management Systems 3rd Edition, McGraw-Hill, 2002. | | |
| 4. Distributed Databases: Principles and Systems; Stefano Ceri, Giuseppe Pelagatti, Tata McGraw Hill | | |

| Paper Code: HCSCR4102P | Database Management Systems (Practical) | Marks: 40 |
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