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|  |  | |  | | | | |
| Hours / Week | : | 4 | |  | Sessional Marks | : | 40 |
| Credits | : | 4 | |  | End Examination Marks | : | 60 |

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| **UNIT – I** |
| **Database-System Architectures**: Centralized and Client–Server Architectures, Server System Architectures, Parallel Systems, Distributed Systems, Network Types.  **Query Processing**: Overview, Measures of Query Cost, Selection Operation, Sorting, Join Operation, Other Operations, Evaluation of Expressions. |
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| **UNIT – II** |
| **Parallel Databases**: Introduction, I/O Parallelism, Interquery Parallelism, Intraquery Parallelism, Intraoperation Parallelism, Interoperation Parallelism, Query Optimization, Design of Parallel Systems, Parallelism on Multicore. |
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| **UNIT – III** |
| **Distributed Databases**: Homogeneous and Heterogeneous Databases, Distributed Data Storage, Distributed Transactions, Commit Protocols, Concurrency Control in Distributed Databases, Availability, Distributed Query Processing, Heterogeneous Distributed Databases, Cloud-Based Databases, Directory Systems. |
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| **UNIT – IV** |
| **Object-Based Databases**: Overview, Complex Data Types, Structured Types and Inheritance in SQL, Table Inheritance, Array and Multiset Types in SQL, Object-Identity and Reference Types in SQL, Implementing O-R Features, Persistent Programming Languages, Object-Relational Mapping, Object-Oriented versus Object-Relational |
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| **UNIT - V** |
| **CASE STUDY**  Oracle: Database Design and Querying, Tools, SQL Variations and Extensions, Storage and Indexing, Query Processing and Optimization, Concurrency Control and Recovery, System Architecture, Replication, Distribution, and External Data, Database Administration Tools, Data Mining. |
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| TEXT BOOKS |
| 1. Abraham Silberchatz, Henry F. Korth, S.Sudarsan, Database System Concepts, Fifth Edition, McGraw-Hill, 2006. |
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| REFERENCE BOOKS |
| 1. Ramez Elmasri & Shamkant B. Navethe, Fundamentals of Database Systems, fourth Edition, Pearson Education, 2004. 2. Stefano Ceri, Giuseppe Pelagatti, Distributed Databases Principles and Systems, McGraw-Hill International Editions, 1985. 3. Thomas M. Connolly, Carolyn E. Begg, Database Systems – A Practical Approach to Design, Implementation and Management, Third edition, Pearson Education, 2003. |