

Hemchandracharya North Gujarat University, Patan

B.E. SEMESTER – III (IT)

IT306: DATABASE MANAGEMENT SYSTEM

Teaching Scheme

Theory	03 Hrs/Week
Tutorial	-
Practical	02 Hrs/Week
Total	05 Hrs/Week

Examination Scheme

Theory	100 Marks
Practical	25 Marks
Term work	25 Marks
Total	150 Marks

1. **Introductory concepts of DBMS:**

Introduction and applications of DBMS, Purpose of data base, Data Independence, Database System architecture- levels, Mappings, Database users and DBA

2. **Relational Model:**

Structure of relational databases, Domains, Relations, Relational algebra – fundamental operators and syntax, relational algebra queries

3. **Entity-Relationship Model:**

Basic concepts, Design process, constraints, Keys, Design issues, E-R diagrams, weak entity sets, extended E-R features – generalization, specialization, aggregation, reduction to E-R database schema

4. **Relational Database design:**

Functional Dependency – definition, trivial and non-trivial FD, closure of FD set, closure of attributes, irreducible set of FD, Normalization – 1NF, 2NF, 3NF, Decomposition using FD-dependency preservation, BCNF, Multivalued dependency, 4NF, Join dependency and 5NF

5. **Query Processing & Query Optimization:**

Overview, measures of query cost, selection operation, sorting, join, evaluation of expressions, transformation of relational expressions, estimating statistics of expression results, evaluation plans, materialized views

6. **Transaction Management:**

Transaction concepts, properties of transactions, serializability of transactions, testing for serializability, System recovery, Two- Phase Commit protocol, Recovery and Atomicity, Log-based recovery, concurrent executions of transactions and related problems, Locking mechanism, solution to concurrency related problems, deadlock, two-phase locking protocol, Isolation, Intent locking

7. **Security:**

Introduction, Discretionary access control, Mandatory Access Control, Data Encryption

8. **SQL Concepts:**

Basics of SQL, DDL,DML,DCL, structure – creation, alteration, defining constraints – Primary key, foreign key, unique, not null, check, IN operator, aggregate functions, Built-in functions –numeric, date, string functions, set operations, sub-queries, correlated sub-queries, join, Exist, Any, All , view and its types., transaction control c ommands.

9. **PL/SQL Concepts:**

Cursors, Stored Procedures, Stored Function, Database Triggers

Reference Books:

1. An introduction to Database Systems, C J Date, Addison -Wesley.
2. Database System Concepts, Abraham Silberschatz, Henry F. Korth & S.Sudars han, McGraw Hill.
3. Understanding SQL by Martin Gruber, BPB
4. SQL- PL/SQL by Ivan bayross
5. Oracle – The Complete Reference- TMH /oracle press