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| **PR GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA** |
| **Course Code** | **DATA BASE MANAGEMENT SYSTEM** | **II BCOM****(Minor)****Sem - III****2024-2025** |
| **Hours** | 90 (60 Theory + 30 Practical) | L | T | P | C |
| **Pre requisites** | Basic Computer Knowledge | 4 | - | 2 | 4 |

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| **Course Objective** |
| 1. *Understand the role of a database management system in an organization.*
2. *Understand basic database concepts, including the structure and operation of the relational data model.*
3. *Understand and successfully apply logical database design principles, including E-R diagrams and database normalization*
4. *Understand Functional Dependency and Functional Decomposition.*
5. *Gets the information about creating tables, modifications of tables etc.*
6. *Gets knowledge about writing of PL/SQL program with many options like Triggers, functions, procedures etc.*
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| **Course Outcomes** |
| On Completion of the course, the students will be able to – |
| CO1  | Students would learn about Understand the role of a database management system in an organization. Understand basic database concepts, including the structure and operation of the relational data model. Understand and successfully apply logical database design principles, including E-R diagrams and database normalization Understand Functional Dependency and Functional Decomposition. |
| CO2  | Students would learn about To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS. Perform PL/SQL programming using concept of Cursor Management, Error Handling, Packages. |
| CO3  | Students would learn about Apply various Normalization techniques  Model an application’s data requirements using conceptual modeling tools like ER diagrams and design database schemas based on the conceptual model . |
| CO4  | Students would learn about Design and implement a small database project. |

## **P R GOVT COLLEGE(AUTONOMOUS), KAKINADA**

**DEPARTMENT OF COMPUTER APPLICATIONS**

**II B.Com (Minor) Semester- III (2024-2025)**

**Data Base Management System**

**SYLLABUS**

**Unit 1: Overview of Database Systems: Introduction**: Database system, Characteristics (Database Vs File System), Database Users, Advantages of Database systems, Database applications.

**Data Models:** Introduction; types of data models, Concepts of Schema, Instance and data independence; Three tier schema architecture for data independence; Database system structure, environment, Centralized and Client Server architecture for the database.

**Case Study**:

1. Describe the differences between Database systems and File based systems

2. Study about database models and their advantages and dis-advantages

**Unit 2: Relational Model**: Introduction to relational model, Codd’s rules, concepts of domain, attribute, tuple, relation, constraints (Domain, Key constraints, integrity constraints) and their importance , concept of keys (super key, candidate key, primary key, surrogate key, foreign key) , relational Algebra & relational calculus.

**Normalization**: Purpose of Normalization or schema refinement, concept of functional dependency, normal forms based on functional dependency(1NF, 2NF and 3NF), Boyce-codd normal form(BCNF).

**Case Study**: Describe Relational model and normalization for database design

**Unit 3: Entity Relationship Model**: Introduction, Representation of entities, attributes, entity set, relationship, relationship set, constraints, sub classes, super class, inheritance, specialization, generalization using ER Diagrams,

**BASIC SQL**: Database schema, data types, DDL operations (create, alter, drop, rename), DML operations (insert, delete, update), basic SQL querying (select and project) using where clause, arithmetic & logical operations, aggregation, grouping, ordering.

**Case Study**:

1. Examine issues in data storage and query processing using SQL.

2. Create, maintain and manipulate a relational database using SQL

**Unit 4: SQL**: Nested queries/ sub queries, implementation of different types of joins, SQL functions(Date, Numeric, String, Conversion functions), Creating tables with relationship, implementation of key and integrity constraints, views, relational set operations , Transaction Control Language: commit, Rollback, Savepoint , DCL :Grant, Revoke

**Case Study**:

Try to convert some sample data to information and show how it can you be used in decision making.

**Unit 5: PL/SQL**: Introduction, Structure , Control Structures , Cursors , Procedure , Function , Packages , Exception Handling ,Triggers.

**Transaction processing Concepts** : Transaction State, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Testing for Serializability, Failure Classification, Storage, Recovery and Atomicity, Recovery algorithm.

**Case Study**:

Outline the role and issues in Transaction management of data such as efficiency, privacy, security.

**References:**

1. Paneerselvam:Database Management system,PHI.

2. David Kuklinski, Osborne, Data management system McGraw Hill Publication.

3. Shgirley Neal And Kenneth LC Trunik Database management system in Business-PHI.

4. Godeon C. EVEREST, Database Management-McGraw Hill Book Company.

5. MARTIN,Database Management-Prentice Hall of India, New Delhi.

6. Bipin C.Desai ,`An Introduction to Database System`,Galgotia Publications

7. Korth, Database Management System.

8. Navathe, Database Management System.

9. S. Sumathi, S. Esakkirajan,Fundamentals of Relational Database Management System

**Online resources:**

http:// www.onlinegdb.com/

http:// www.tutorialspoint.com/

**Practical Component: @ 2 hours/week/batch**

Aim: An enterprise wishes to maintain a database to automate its operations. Enterprise is divided into certain departments and each department consists of employees. The following two tables describe the automation schemas.

Emp(Empno, Ename, Job, Mgr, Hiredate, Sal, Comm, Deptno)

Dept(Deptno, Dname, Loc)

1. List the details of employees who have joined before the end of September ’81.

2. List the name of the employee and designation of the employee, who does not report to anybody.

3. List the name,salary and PF amount of all the employees(PF is calculated as10%of salary)

4. List the names of employees who are more than 2 years old in the organization.

5. Determine the number of employees, who are taking commission.

6. Update the employee salary by 20%,whose experience is greater than 12 years.

7. Determine the department does not contain any employees.

8. Create a view, which contains employee name and their manager names working in sales department.

9. Determine the employees, whose total salary is like the minimum salary of any department.

10. List the department numbers and number of employees in each department.

**PL/SQL PROGRAMS**

1. Writea PL/SQL program to check the given string is palindrome or not.

2. The HRD manager has decided to raise the employee salary by 15% write a PL/SQL block to accept the employee number and update the salary of that employee. Display appropriate messages based on the existence of the record in the Emp table.

3. Write a PL/SQL program to display the top 10 rows in the Emp table based on their job and salary.

4. Write a PL/SQL program to raise the employee salary by 10% for department number 30 people and also maintain the raised details in the rais table.

5. Create a procedure to update the salaries of Employees by 20%, for those who are not getting commission

6. Create a trigger to avoid any transactions (insert, update, delete) on EMP table on Saturday & Sunday.

**RECOMMENDED CO-CURRICULAR ACTIVITIES:**

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

**Measurable**

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)

2. Student seminars (on topics of the syllabus and related aspects (individual activity)

3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams)

4. Field studies (individual observations and recordings as per syllabus content and related areas (Individual or team activity)

5. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity)

**General**

3. Group Discussion

4. Visit to Software Technology parks / industries

**RECOMMENDED CONTINUOUS ASSESSMENT METHODS:**

Some of the following suggested assessment methodologies could be adopted:

1. The oral and written examinations (Scheduled and surprise tests),

2. Closed-book and open-book tests,

3. Coding exercises,

4. Practical assignments and laboratory reports,

5. Observation of practical skills,

6. Individual and group project reports,

7. Efficient delivery using seminar presentations,

8. Viva voce interviews.

9. Computerized adaptive testing, literature surveys and evaluations,

10. Peers and self-assessment, outputs form individual and collaborative work

**Mapping of Cos with POs/PSOs**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **CO /PO** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO****10** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| CO1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CO2 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CO3 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CO4 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CO5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

## **P R GOVT COLLEGE(AUTONOMOUS), KAKINADA**

**DEPARTMENT OF COMPUTER APPLICATIONS**

**II B.Com (Minor) Semester- III (2024-2025)**

**Data Base Management System**

**PAPER- II Marks: 50M**

**Model blue print for the model paper and choice**

|  |  |  |  |
| --- | --- | --- | --- |
| **S.NO** | **Type of Question** | **To be given in the Question Paper** | **To be answered** |
| **No. of Questions** | **Marks allotted to each question** | **Total Marks** | **No. of Questions** | **Marks allotted to each question** | **Total Marks** |
| 1 | Section-AEssay Questions | **6** | **10** | **60** | **3** | **10** | **30** |
| 2 | Section-BShort Questions | **7** | **5** | **35** | **4** | **5** | **20** |
| **TOTAL**  | **13** |  | **95** | **TOTAL MARKS** | **50** |

 95 - 50 45

 Percentage of choice given = ------------ x 100= ------ x 100 = 47.36%

 95 95

**Model Blue print for the question paper setter**

|  |  |  |  |
| --- | --- | --- | --- |
| **Chapter Name** | **Essay Questions****10 Marks** | **Short Questions****5 Marks** | **Marks allotted to the chapter** |
| **UNIT-I** | **2** | **2** | **30** |
| **UNIT -II** | **1** | **1** | **15** |
| **UNIT -III** | **1** | **1** | **15** |
| **UNIT -IV** | **1** | **2** | **20** |
| **UNIT -V** | **1** | **1** | **15** |
| **Total No. of questions** | **6** | **7** |  |
| **Total Marks Including choice** | **95** |

## **P R GOVT COLLEGE(AUTONOMOUS), KAKINADA**

**DEPARTMENT OF COMPUTER APPLICATIONS**

**II B.Com (Minor) Semester- III (2024-2025)**

**MODEL PAPER**

**Database Management System**

**Time : 2 Hrs** **SEMESTER-III**  **Max. Marks: 50**

**Section-I**

**Answer Any Three Questions. At least One question from each part (3x10=30M)**

**Part-A**

1. What is meant by DBMS? Explain advantages of DBMS (BT2)
2. Explain the components of database system with a neat diagram (BT1)
3. Discuss about building blocks of Entity-Relationship diagram (BT1)

**Part-B**

1. What is data model? Write about relational data model (BT2)
2. Explain DDL, DML and DCL commands in SQL (BT1)
3. Write about while loop used in PL/SQL (BT1)

**Section-II**

**Answer any FOUR Questions. Each question carries 5 marks (4x5=20M)**

1. Explain about objectives of DBMS (BT2)
2. What are the functions of DBA (BT1)
3. Explain about Aggregation (BT2)
4. Explain about i) Candidate key ii) Primary key iii) Foreign key (BT1)
5. What is SQL? Explain about different data types in SQL (BT1)
6. Explain about Aggregate functions in SQL (BT1)
7. Write about cursors in PL/SQL (BT2)

## **P R GOVT COLLEGE(AUTONOMOUS), KAKINADA**

**DEPARTMENT OF COMPUTER APPLICATIONS**

**II B.Com(Mionr) Semester- IV(W.E.F 2024-25)**

**Course: Database Management System**

**Question Bank**

**Unit-1**

**Essay Questions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | What is meant by DBMS? Explain advantages of DBMS. | BT2 | CO1 | PO1 |
|  | Explain about characteristics and drawbacks of File based system. | BT1 | CO2 | PO2 |
|  | Explain the components of database system with a neat diagram. | BT1 | CO3 | PO3 |
|  | Explain DBMS architecture in detail. | BT2 | CO3 | PO3 |

**Unit-2**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | What is data model? Write about relational data model. | BT1 | CO1 | PO1 |
|  | List out the CODD’s Rules | BT1 | CO2 | PO2 |
|  | Explain the operations of Relational Algebra | BT2 | CO3 | PO3 |
|  | What is Normalization? Explain the Normal forms. | BT3 | CO3 | PO3 |

**Unit-3**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Discuss about building blocks of Entity-Relationship diagram. | BT1 | CO1 | PO1 |
|  | Write about Generalization and Specialization. | BT1 | CO2 | PO2 |
|  | Explain DDL and DML commands in SQL. | BT1 | CO2 | PO2 |
|  | Explain about Set operators in SQL with examples. | BT2 | CO2 | PO2 |
|  | Define Query. Explain Select statements with suitable examples | BT2 | CO3 | PO3 |

**Unit-4**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Explain different types of joins in SQL | BT1 | CO1 | PO1 |
|  | Write about String functions in SQL | BT1 | CO2 | PO2 |
|  | Discuss about TCL Commands in SQL | BT2 | CO3 | PO3 |
|  | How to create views in SQL | BT3 | CO3 | PO3 |

**Unit-5**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | What is PL/SQL? Write about structure of PL/SQL with example. | BT1 | CO1 | PO1 |
|  | Write about looping statements used in PL/SQL. | BT1 | CO2 | PO2 |
|  | Discuss about Cursors in PL/SQL | BT2 | CO3 | PO3 |
|  | Write about Serializability in transaction processing | BT3 | CO3 | PO3 |

**Short Answer Questions**

**Unit-1**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Explain about objectives of DBMS. | BT2 | CO1 | PO1 |
|  | Explain about database users. | BT1 | CO2 | PO2 |
|  | What are the functions of DBA? | BT1 | CO3 | PO3 |
|  | Distinguish between data and information. | BT3 | CO1 | PO1 |

**Unit-2**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Explain about relational model. | BT2 | CO1 | PO1 |
|  | Explain about i) Candidate key ii) Primary key iii) Foreign key | BT2 | CO2 | PO2 |
|  | Discuss about Relational calculus | BT1 | CO3 | PO3 |
|  | Explain about BCNF. | BT1 | CO1 | PO1 |

**Unit-3**

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| --- | --- | --- | --- | --- |
|  | What is SQL? Explain about different data types in SQL. | BT1 | CO1 | PO1 |
|  |  What are the data types available in SQL. | BT2 | CO2 | PO2 |
|  | Explain about Aggregation | BT2 | CO2 | PO2 |
|  | Explain about aggregate functions in SQL. | BT1 | CO3 | PO3 |

**Unit-4**

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| --- | --- | --- | --- | --- |
|  | Write about Nested Query. | BT2 | CO1 | PO1 |
|  | Explain about Date functions in SQL | BT1 | CO2 | PO2 |
|  |  Write about DCL commands in SQL | BT1 | CO3 | PO3 |

**Unit-5**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Explain about simple IF statement in PL/SQL | BT2 | CO1 | PO1 |
|  | Explain about Triggers in PL/SQL. | BT1 | CO2 | PO2 |
|  |  What is transaction processing? | BT1 | CO3 | PO3 |