



SILIGURI INSTITUTE OF TECHNOLOGY
COMPUTER SCIENCE & ENGINEERING



COURSE FILE

2ND SEM, 3RD YEAR, 2020

SEC – B

PAPER DESCRIPTION : Database Management System

PAPER CODE : CS 601 & CS 691

Course File

Course Title: Database Management System

Code : CS 601 & CS691

Semester:- 6th **Year:-** 3rd

Name of the Faculty: Prof. Jayashree Singha

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E-mail : jaysin31m85@gmail.com

Class Schedule

Lecture				Practical
Monday 10:50 AM - 11:40 AM	Wednesday 10:00 AM - 10:50 AM	Thursday 11:40 AM - 12:30 PM	Friday 2.10 PM -3.00 PM	Monday 2:10 PM - 4:40 PM (B1) Wednesday 2:10 PM - 4:40 PM (B2)

Hours for meeting students:

Monday to Friday 4.40 PM -5.30 PM

i) Course Objective

Students will be able to design normalized database and apply it to build secure and efficient applications.

ii) Course Outcomes

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes.

		Target
CS 601.1	Understand the fundamental concepts of database system and Entity-Relationship (E-R) model and relate an E-R schema to relation schema. [BT - Level - 2]	60% Marks
CS 601.2	Identify query processing methodologies of Relational Algebra, Relational Calculus and query optimization techniques and apply them to write optimal queries. [BT - Level - 3]	60% Marks
CS 601.3	Construct simple and moderately advanced database queries using SQL and PL/SQL blocks for ensuring data integrity and security. [BT - Level -4]	60% Marks
CS 601.4	Understand the concepts of normalization and apply such knowledge to the normalization of a database; and be able to identify basic database storage structures and access techniques. [BT - Level - 3]	60% Marks

CS 601.5	Explain the basic issues of transaction processing, concurrency control and recovery mechanisms in applications. [BT - Level – 2]	60% Marks
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- i. Once the student has successfully complete this course, he/she must be able to answer the following questions or perform / demonstrate the following:

Sl.	Question	CO
1.	What do you understand by database and database management system?	1
2.	Explain the 3-schema architecture of DBMS. How are these different schema layers related to the concepts of logical and physical data independence?	1
3.	What do you understand by physical and logical data independence and why are they important?	1
4.	Describe the role of DBA.	1
5.	Explain the following terms briefly: attribute, domain, entity, relationship, entity set, relationship set, one-to-many relationship, many-to-many relationship, participation constraint, overlap constraint, covering constraint, weak entity set, specialization, generalization, aggregation, and role indicator.	1
6.	Describe a banking system database with the help of suitable ERD.	1
7.	Use mathematical notations of relational algebra to express a database query. Consider the following tables: SUPPLIER (SUPPLIER_ID, SUPPLIER_NAME, SUPPLIER_ADDRESS) PARTS (PART_ID, PART_NAME, COLOR) CATALOG (SUPPLIER_ID, PART_ID, COST) Write the following queries in Relational Algebra based on above mentioned tables: a. Find names of the suppliers who supply 'YELLOW' parts. b. Find names of the suppliers who supply both 'BLUE' and 'RED' parts. c. Find name of the supplier who supply all parts.	2
8.	Use mathematical notations of relational calculus to express a database query. Consider the following tables: EMPLOYEE (EMPLOYEE_NO, EMPLOYEE_NAME, CITY) WORKS (EMPLOYEE_NO, COMPANY_NAME, SALARY) Write the following query in Tuple and Domain Relational Calculus: Find the name and city of residence of all employees who work for TCS Company.	2
9.	Construct simple and nested queries on a given database system using SQL. Consider the following tables: EMPLOYEE (EMP_CODE, EMP_NAME, DESIGNATION, HEAD, DOJ, BASIC, DEPT_CODE) DEPARTMANT (DEPT_CODE, DEPT_NAME, LOCATION) Write the following queries in SQL	3

	<p>a. List the names of the employees who are earning more than the lowest salary of an employee in department 30.</p> <p>b. List of only those DEPT_CODE where the total salary is greater than 20000.</p> <p>c. List the names of those employees whose names either starts or ends with 'S'.</p> <p>d. List the names of the employees along with the name of the people under whom they are working.</p>	
10.	Explain the concepts of functional dependency, multivalued dependency and join dependency.	4
11.	Find the closure of the following set F of functional dependencies for the relation schema R. $R=(A, B, C, D,E)$; $F=\{ A\rightarrow BC, CD\rightarrow E, B\rightarrow D, E\rightarrow A\}$	4
12.	Consider the relation schema $R(A, B, C)$ with a set of functional dependencies $F=\{A\rightarrow BC, B\rightarrow C, A\rightarrow B, AB\rightarrow C\}$. Find the irreducible set for F.	4
13.	<p>Consider a relation schema $R(A, B,C, D, E, F)$ with set of functional dependencies $F = \{A\rightarrow BCDEF, BC\rightarrow ADEF, B\rightarrow F, D\rightarrow E \}$.</p> <p>i) Find the candidate keys for R.</p> <p>ii) Decompose R to 3NF.</p> <p>iii) If another functional dependency $D\rightarrow B$ is introduced, what will be the resulting decomposed relation schema?</p> <p>iv) Is the decomposition lossless ?</p>	4
14.	Describe each of the following indexing techniques with suitable example: primary, secondary and clustered indexing.	4
15.	Compare and contrast between: i) B-tree and B ⁺ tree organization	4
16.	<p>Construct a B⁺ tree for the following set of key values: [5, 10, 15, 20, 25, 30, 35, 40, 50, 55, 65,70, 75, 80, 90, 95] when the number of pointers that will fit in one node is: 5</p> <p>i. Insert 60</p> <p>ii. Delete 15, 75</p>	4
17.	Discuss the ACID properties of database.	5
18.	Write the differences among 2PL and Strict 2PL? Which one is advantageous and why?	5
19.	<p>Determine whether the following schedule S is conflict or serial?</p> <p>S: [R3(y); R3(z); R1(x); W1(x); W3(z); W3(y); R2(z); R1(y); W1(y); R2(y); W2(y); R2(x); W2(x)]</p> <p>If conflict then, find the equivalent serial schedule.</p>	5
20.	Describe log-based and non-log based recovery techniques.	5

iii) Topic/Unit/Chapter Layout

Chapter No.	Topic/Unit/Chapter	Lecture Hours	Tutorials	Laboratory hours
Chapter - 1	Introduction	4 HRS	NOT APPLICABLE	
Chapter - 2	Entity-Relationship Model	6 HRS		
Chapter - 3	Relational Model	5 HRS		
Chapter - 4	SQL and Integrity Constraints	8 HRS		26 HRS
Chapter - 5	Relational Database Design	9 HRS		2 HRS
Chapter - 6	Internals of RDBMS	7 HRS		
Chapter - 7	File Organization & Index Structures	6 HRS		2HRS
	Total	45 HRS		30 HRS

iv) Textbooks

1. Henry F. Korth and Silberschatz Abraham, "Database System Concepts", Mc.Graw Hill.
2. Elmasri Ramez and Novathe Shamkant, "Fundamentals of Database Systems", Benjamin Cummings Publishing Company.

Reference books :

1. James Martin, "Principles of Database Management Systems", 1985, Prentice Hall of India, New Delhi
2. "Fundamentals of Database Systems", Ramez Elmasri, Shamkant B.Navathe, Addison Wesley Publishing Edition
3. "Database Management Systems", Arun K.Majumdar, Pritimay Bhattacharya, Tata McGraw Hill

(v) Evaluation Scheme

1) Theory

Evaluation Criteria	Marks
Continuous Assessment	25
Attendance	5
University Exam/External Exam	70
Total	100

* The Internal assessment will be determined through the continuous assessment (CA) which is needed to be submitted 4 times in a semester based on performance of the students assessed as per

academic calendar published by the University. The 4 no's of CAs will be based on test/ viva/ quiz/ presentation/seminar/ GD etc. out of which 2 no's preferably would be tests.

Schedule for Continuous Assessment (CA):

CA Description	Schedule
Quiz - 1	As per Institute Academic Calendar
1 st Internal Examination	
Quiz - 2	
Assignment	
2 nd Internal Examination	

Course target attainment levels:

Attainment Level	Inference	Marks
Attainment Level 1	50% of the students have attained more than the target level of that CO	1
Attainment Level 2	60% of the students have attained more than the target level of that CO	2
Attainment Level 3	70% of the students have attained more than the target level of that CO	3

Course Target for the university examination = 60% of the students will get "A" Grade

Target has been set on the basis of last year's performance / result by the students, student quality this year and difficulty level of the course.

University Grading System:

Grade	Marks
O	90% and above
E	80 - 89.9%
A	70 - 79.9%
B	60 - 69.9%
C	50 - 59.9%
D	40 - 49.9%
F	Below 40%

(vi) Mapping of Course Outcomes and Program Outcomes:

Course Outcomes	Program Outcomes (PO's)												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CS 601.1	2	2	2	--	--	--	--	--	--	--	--	--	1	2
CS 601.2	2	3	1	1	--	--	--	--	--	--	--	--	3	2
CS 601.3	2	2	2	--	1	--	--	--	1	--	--	1	2	3
CS 601.4	2	2	2	--	--	--	--	--	--	--	--	--	--	3
CS 601.5	2	2	2	--	--	--	--	--	--	--	--	--	--	3
CS 601	2	2	2	1	1	--	--	--	1	--	--	1	2	3

- 1 = courses in which the student will be exposed to a topic
2 = courses in which students will gain competency in that area
3 = courses in which students will master that skill

(vii) Assessment Methodology

Outcome	Assessment Tool
CS 601.1	Internal Test, Quiz, Assignment, University Exam
CS 601.2	
CS 601.3	
CS 601.4	
CS 601.5	

(VIII) Weekly Lesson Plan

CHAPTER / UNIT	Topic Description (to be quoted from syllabus)	No. of Lectures	Plan Date(s)	Execution Date(s)	Homework/ Assignment/ Quiz
I	Introduction				
Unit -I	Overview of DBMS: Definition, Application, File & Database Concepts	1	20.1.20		
	3 Schema architecture, Data Abstraction, Data Independence	1	21.1.20		
	Database Users, Database Administrator, Concepts of Instances and Schemas, Metadata, Data Dictionary, Data Models	1	24.1.20		
	Assessment on this CHAPTER - I	--			Quiz
II	Entity-Relationship Model				
Unit I I	ERD: Basic concepts, Degree and Cardinality of relationship, Types of attributes, Mapping Cardinalities	1	27.1.20		
	Keys: (super, candidate, primary, alternate, foreign) keys, Integrity Constraints	1	28.1.20		
	Weak Entity sets, Participation constraints, ERD example	1	31.1.20		Homework
	Specialization and Generalization and the Constraints on them, Aggregation	1	3.2.20		Homework
	ERD example	1	4.2.20		Homework
	Design of RDBMS from ERD	1	6.2.20		Homework
	Assessment on this CHAPTER - II	--			Assignment
IV	SQL and Integrity Constraints				
Unit-I V	SQL: Data Languages-Procedural & Non-Procedural, Basic SQL commands: CREATE, ALTER, DROP, TRUNCATE, RENAME, Constraints: PRIMARY KEY, REFERENCIAL KEY, CHECK , NOT NULL, UNIQUE, DEFAULT	1	7.2.20		
	SQL commands: INSERT, UPDATE, DELETE, SELECT, WHERE, DISTINCT, AND,OR, NOT, BETWEEN, IN, LIKE,ORDER BY,	1	10.2.20		
	Aggregate Functions, GROUP BY, HAVING, UNION, INTERSENCT, MINUS/EXCEPT	1	11.2.20		
	Nested sub queries using Comparison operators, IN, NOT IN, EXISTS, NOT EXISTS, ALL, SQL Queries with example	1	13.2.20		
	SQL Queries with example practice	1	14.2.20		

	Assessment on this CHAPTER - IV	--			Assignment, Quiz
III	Relational Model				
Unit-II	Relational Algebra Operations: select, project, Cartesian product, union, intersect, set difference	1	17.2.20		
	Join: inner join, outer join, assignment, rename	1	18.2.20		Homework
	Generalized projection, Aggregate functions, Modifications of database: insert, update, delete	1	20.2.20		
	Division, Relational algebra Queries with example	1	21.2.20		
	Relational algebra Queries with example,	1	24.2.20		Homework
	Relational Calculus: Tuple Relational Calculus with example	1	25.2.20		
	Domain relational Calculus with example	1	2.3.20		
	Assessment on this CHAPTER - III	--			Assignment,
V	Relational Database Design				
Unit-V	FD with example	1	3.3.20		Homework
	Armstrongs axioms, Closure of F	1	5.3.20		
	Computing Closure of F examples	1	6.3.20		
	Attribute closure, Its Application, with examples	1	12.3.20		
	Minimal Cover theory	1	13.3.20		
	Minimal Cover example	1	16.3.20		
	Database Normalization : 1NF	1	17.3.20		
	2NF, 3NF, BCNF theory and example	1	19.3.20		
	Normalization example discussion	1	20.3.20		
	Normalization example discussion, Dependency Preservation Property and Lossless Join Decomposition theory and example	1	23.3.20		
	Lossless Join Decomposition example, MVD & 4NF theory and example	1	24.3.20		
	5NF theory and example	1	26.3.20		
	Assessment on this CHAPTER - V	--			Assignment, Quiz

VI	Internals of RDBMS				
U n i t - V I	Transaction properties, states, operations, Schedule	1	27.3.20		
	Serializability, Test for Conflict serializability, Recoverable schedule, Cascadeless schedule	1	30.3.20		
	View serializability, Need for Concurrency Control	1	31.3.20		
	Concurrency Control Techniques: Locks, 2PL	1	2.4.20		
	Deadlock, Time Stamp Protocol	1	3.4.20		
	Log based Recovery Techniques,	1	6.4.20		
	Check Points, Non-log based Recovery Techniques	1	7.4.20		
	Query Optimization Steps, Operator Tree Construction	1	9.4.20		
	Assessment on this CHAPTER - VI	--			Quiz
VII	File Organization & Index Structures				
Uni t-VI I	Indexing Techniques: Primary , Clustered, Secondary	1	10.4.20		
	Multilevel Index, Problems on Indexing	1	13.4.20		
	B Tree Construction, Insertion, Deletion	1	16.4.20		
	B+ Tree Construction, Insertion, Deletion	1	17.4.20		
	Assessment on this CHAPTER - VII	--			Quiz

2) Laboratory

Expt. No.	Experiment Name	Schedule	Marks																																
P1	<p>1. a) Create following tables-</p> <p>Table Name: Department</p> <table border="1"> <thead> <tr> <th>Col Name</th> <th>Type</th> <th>Width</th> <th>Constraint</th> </tr> </thead> <tbody> <tr> <td>DNO</td> <td>NUMBER</td> <td>2</td> <td>PRIMARY KEY</td> </tr> <tr> <td>DNAME</td> <td>VARCHAR2(10)</td> <td>10</td> <td>NOT NULL</td> </tr> </tbody> </table> <p>Table Name: Employee</p> <table border="1"> <thead> <tr> <th>Col Name</th> <th>Type</th> <th>Width</th> <th>Constraint</th> </tr> </thead> <tbody> <tr> <td>ENO</td> <td>NUMBER</td> <td>2</td> <td>PRIMARY KEY</td> </tr> <tr> <td>ENAME</td> <td>VARCHAR2(10)</td> <td>10</td> <td>NOT NULL</td> </tr> <tr> <td>DNO</td> <td>NUMBER</td> <td>2</td> <td>REFERENCES Department</td> </tr> <tr> <td>SALARY</td> <td>NUMBER</td> <td>6</td> <td></td> </tr> </tbody> </table>	Col Name	Type	Width	Constraint	DNO	NUMBER	2	PRIMARY KEY	DNAME	VARCHAR2(10)	10	NOT NULL	Col Name	Type	Width	Constraint	ENO	NUMBER	2	PRIMARY KEY	ENAME	VARCHAR2(10)	10	NOT NULL	DNO	NUMBER	2	REFERENCES Department	SALARY	NUMBER	6		3 HRS	3
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	<p>b) Insert the following data-</p> <p>Table: Department</p> <table border="1"> <thead> <tr> <th>DNO</th> <th>DNAME</th> </tr> </thead> <tbody> <tr> <td>10</td> <td>Admin</td> </tr> <tr> <td>20</td> <td>Accounts</td> </tr> <tr> <td>30</td> <td>Sales</td> </tr> <tr> <td>40</td> <td>Marketing</td> </tr> <tr> <td>50</td> <td>Purchasing</td> </tr> </tbody> </table> <p>Table: Employee</p> <table border="1"> <thead> <tr> <th>ENO</th> <th>ENAME</th> <th>DNO</th> <th>SALARY</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Amal</td> <td>10</td> <td>30000</td> </tr> <tr> <td>2</td> <td>Shyamal</td> <td>30</td> <td>50000</td> </tr> <tr> <td>3</td> <td>Kamal</td> <td>40</td> <td>10000</td> </tr> <tr> <td>4</td> <td>Nirmal</td> <td>50</td> <td>60000</td> </tr> <tr> <td>5</td> <td>Bimal</td> <td>20</td> <td>40000</td> </tr> <tr> <td>6</td> <td>Parimal</td> <td>10</td> <td>20000</td> </tr> </tbody> </table> <p>c) Display all data from Department table.</p> <p>d) Display all data from Employee table.</p> <p>e) Try to insert following value in Employee table(copy error message) (1,akash,60,70000)</p> <p>f) Try to insert following value in Employee table(copy error message) (1,akash,60,70000)</p> <p>g) Display name and salary of all employees whose department no is 10.</p> <p>h) Display the name and salary of all employees who working in Accounts Department.</p>	DNO	DNAME	10	Admin	20	Accounts	30	Sales	40	Marketing	50	Purchasing	ENO	ENAME	DNO	SALARY	1	Amal	10	30000	2	Shyamal	30	50000	3	Kamal	40	10000	4	Nirmal	50	60000	5	Bimal	20	40000	6	Parimal	10	20000		
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P2	<p>2. a) Create following tables-</p> <p>Table Name: Project</p> <table border="1"> <thead> <tr> <th>Col Name</th> <th>Type</th> <th>Width</th> <th>Constraint</th> </tr> </thead> <tbody> <tr> <td>PNO</td> <td>NUMBER</td> <td>2</td> <td></td> </tr> <tr> <td>PNAME</td> <td>VARCHAR2(10)</td> <td>10</td> <td></td> </tr> <tr> <td>LOCATION</td> <td>VARCHAR2(20)</td> <td>20</td> <td></td> </tr> </tbody> </table> <p>Table Name: Work</p> <table border="1"> <thead> <tr> <th>Col Name</th> <th>Type</th> <th>Width</th> <th>Constraint</th> </tr> </thead> <tbody> <tr> <td>ENO</td> <td>NUMBER</td> <td>2</td> <td>REFERENCES Employee</td> </tr> <tr> <td>PNO</td> <td>NUMBER</td> <td>2</td> <td></td> </tr> <tr> <td>HOURS</td> <td>NUMBER</td> <td>3</td> <td></td> </tr> <tr> <td>PLOCATION</td> <td>VARCHAR2(20)</td> <td>20</td> <td></td> </tr> </tbody> </table> <p>b) Add a foreign key constraint on column 'PNO' in 'Work' table referencing column 'PNO' in table 'Project' and name the constraint as FK_PNO. (Copy the Error message)</p> <p>c) Add a Primary Key on PNO in Project Table.</p> <p>d) Add a Primary Key on Eno in Work Table.</p> <p>e) Drop the Primary Key of the table Work.</p> <p>f) Now add a composite Primary key on ENO,PNO in Work Table.</p> <p>g) Try to add a foreign key constraint on column 'PNO' in 'Work' table referencing column 'PNO' in table 'Project' and name the constraint as FK_PNO.</p> <p>h) Add a check constraint on 'LOCATION' column so that permissible value for 'LOCATION' attribute must be among 'Kolkata', 'Mumbai','Chennai','Delhi' and name the constraint as CHK_ENG.</p> <p>i) Add a new column 'MANAGER_No' in table 'Employee'. The data type is number and width is 3.</p> <p>j) Change width of 'MANAGER_NO' column to 2.</p> <p>k) Add a NOT NULL constraint on Pname in Project Table.</p>	Col Name	Type	Width	Constraint	PNO	NUMBER	2		PNAME	VARCHAR2(10)	10		LOCATION	VARCHAR2(20)	20		Col Name	Type	Width	Constraint	ENO	NUMBER	2	REFERENCES Employee	PNO	NUMBER	2		HOURS	NUMBER	3		PLOCATION	VARCHAR2(20)	20		3 HRS	3
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	l) Drop column PLOCATION from Work Table.																
P3	<p>1. Insert appropriate data on Project table and Work table.</p> <p>2. Update MANAGER_NO column with following data:-</p> <table border="1"> <thead> <tr> <th>ENO</th> <th>MANAGER_NO</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> </tr> <tr> <td>2</td> <td>1</td> </tr> <tr> <td>3</td> <td>4</td> </tr> <tr> <td>4</td> <td>5</td> </tr> <tr> <td>5</td> <td>2</td> </tr> <tr> <td>6</td> <td>1</td> </tr> </tbody> </table> <p>3. Write queries using SQL:-</p> <p>a. To list the name of all Employees.</p> <p>b. Display data from table 'Project' with column heading PROJECT_NO, PROJECT_NAME.</p> <p>c. List the name of the Project in Mumbai.</p> <p>d. List employees having name starting with letter 'S'.</p> <p>e. List Employees where second character of name is 'a'.</p> <p>f. To list the Project name where the project locations are Kolkata and Delhi.</p> <p>g. List the name of all employees from where department no is 10 and salary above 50000.</p> <p>h. To sort the employee data in alphabetic order of employee name.</p> <p>i. To sort the employee data in descending order of salary.</p>	ENO	MANAGER_NO	1		2	1	3	4	4	5	5	2	6	1	3 HRS	3
ENO	MANAGER_NO																
1																	
2	1																
3	4																
4	5																
5	2																
6	1																
P4	<p>Q1. Write queries using SQL:-</p> <p>a. Display the employee name, department name and project location of all employee.</p> <p>b. Display the employee name, project name, working hour of all employee.</p> <p>c. Display names of all employees who work more than 28 hours.</p> <p>d. Display the name of all employees who work in 'Kolkata' or 'Mumbai'.</p> <p>e. Display name of the employee, who work in same location as that of 'Shyamal'.</p> <p>f. List the name of employees who are working on more than one project.</p> <p>g. Write a query to select first two rows from employee table.</p> <p>h. Write a query to select last two rows from employee table.</p> <p>i. Display the name, salary, HRA of employees (HRA calculated as 15% of salary).</p> <p>j. Retrieve the maximum and minimum salary for each department.</p> <p>k. Display the employee name and their respective manager's name.</p> <p>l. Display the name of the employee who is earning second maximum salary.</p> <p>m. Display the name of the employee who is earning nth highest salary.</p> <p>n. Display the name of the employees whose salary is greater than the salary of all the employee whose manager no is 2.</p>	3 HRS	3														

	<p>o. Get the details of all employees whose salary is lesser than the average salary of the employees.</p> <p>p. Drop the primary key from Work table.</p> <p>q. Insert two duplicate row in work table.</p> <p>r. Delete duplicate rows from work table.</p> <p>s. Create a view that will show department name and total salary. The name of view will be account.</p> <p>t. Select the department names having total salary greater than 45000. i) Using account view ii) Using employee table.</p> <p>u. Write a query to retrieve Employee names from the Employee table and output will look like:- Mr. A</p>		
P5	<p>Q1. Create following tables:- HOTEL (HOTEL_NO, NAME, ADDRESS) ROOM(ROOM_NO, HOTEL_NO, TYPE, PRICE) BOOKING(HOTEL_NO, GUEST_NO, DATE_FROM, DATE_TO, ROOM_NO) GUEST(GUEST_NO, NAME, ADDRESS)</p> <p>i. Where HOTEL contains hotel details and HOTEL_NO is the Primary Key.</p> <p>ii. ROOM contains room details for each hotel and (HOTEL_NO,ROOM_NO) forms the Primary key. BOOKING contains details of the bookings and the Primary Key comprises (HOTEL_NO, GUEST_NO, DATE_FORM) and GUEST contains guest details and GUEST_NO is the Primary key and mention the Foreign Key constraints.</p> <p>Q2. Write queries using SQL.</p> <p>i. List full details of hotels in Mumbai</p> <p>ii. List the name and addresses of all guests in New Delhi, alphabetically ordered by the name.</p> <p>iii. List all double or family rooms with a price below Rs. 800 per day, in ascending ordered.</p> <p>iv. List the bookings for which no date_to has been specified.</p> <p>v. What is the total daily revenue from all the double room?</p> <p>vi. How many different guests have made booking for august, 2015</p> <p>vii. List the price and type of all rooms at the hotel Land Mark.</p> <p>viii. What is the total income from booking for the hotel Manor today.</p> <p>ix. Retrieve the Hotel name where double room price is above 5000 and single room price is below 2500.</p>	3 HRS	3
P6	<p>Q1. Write a PL/SQL program to check the given number is even or odd.</p> <p>Q2. Write a program to check whether a given number is prime or not.</p> <p>Q3. Write a program to calculate the net salary of a employee where DA is 50%, HRA is 15% of salary. (use previous Employee table.).</p>	3 HRS	3
P7	<p>Q1. A HRD manager has decided to raise the salary for all the employees in department number 10 by 0.05, department number 20 by 0.08, department number 30 by 0.1 and other department by .03 . Whenever any such raise is given to employees an audit trail of the same is maintained in</p>	3 HRS	3

	<p>the EMP_RAISE table. The EMP_RAISE table holds the employee number, the date when the raise was given and the raise amount. Write a PL/SQL block to update the salary of each employee appropriately and insert a record in the EMP_RAISE table as well. Tables are as follows: EMP_RAISE(EMP_CODE, RAISE_AMOUNT, RAISE_DATE)</p>		
P8	<p>Q1.a) Write a PL/SQL function, which returns maximum of the three numbers. b) Write a function, which returns net salary of a given employee where DA is 50%, HRA is 15% of salary. (use previous Employee table.). If employee No is not found then return False. c) Write a procedure to calculate sum of two numbers. d) Write a procedure, which returns net salary and department of a given employee where DA is 50%, HRA is 15% of salary. (use previous Employee table.)</p>	3 HRS	3
P9	<p>Q7. Create a transparent audit system for a table Employee. The system must keep track of the records that are being deleted or updated. The functionality being when a record is deleted or modified the original record details and the date of operations is stored in the audit-client table, the delete or update is allowed to go through. Write a trigger for the above problem. The Tables are as follows:- AUDIT (EMP_NO, NAME, DEPT_NO, OPERATION,USER_ID,OP_DATE) OPERATION : Operation performed on the client-master table OP_DATE : The date when the operation was performed. USER_ID : The name of the user performing the operation.</p>	3 HRS	3
P10	<p>Q1. Create a unique index on ENO column of the table EMP. Q2. Make a group of 5 students. Open two terminals. From one terminal Login into the Oracle server with the user name FACULTY and password FACULTY. (This user has the CREATE USER system privilege. From the other terminal do the experiments with the newly created user. 1. Create a user STUDENT with following characteristics a. The password student123 b. Default tablespace SYSTEM, with a quota of 10 megabytes c. Temporary tablespace TEMP d. Access to the tablespace SYSTEM, with a quota of 5 megabytes e. Limits on database resources defined by the profile DEFAULT 2. After successfully creating this user, try to connect using this username and password. Note the error message and state the reason. 3. Grant the role Connect to the user with admin option. 4. Grant Resource and other necessary system privileges to this user. (e.g. Alter, Create, Insert, Delete, Grant etc.) 5. Now Create the Table Employee(Eno Number(2), EName Varchar2(15)). Insert 3 records. Try different DML operations.</p>	3 HRS	3
Total (Implementation +Viva)			30+10=40

(vii) Delivery Methodology

Outcome	Method	Supporting Tools	Demonstration
CS 601.1	Structured (partially supervised Whole Class- grouping)	Blackboard & Chalk, Lecture Notes	Representation of any database system with ERD design.
CS 601.2	Structured (partially supervised Whole Class- grouping)	Blackboard & Chalk, Lecture Notes	Express a database query using mathematical notations of relational algebra and relational calculus.
CS 601.3	Structured (partially supervised Whole Class- grouping and independent work)	Blackboard & Chalk, Lecture Notes	Construct simple and nested queries on a given database system using SQL, and write PL/SQL programs.
CS 601.4	Structured (partially supervised Whole Class- grouping)	GMEET , GOOGLE CLASS, Lecture Notes, PPT	Design normalized database and demonstrate data retrieval techniques.
CS 601.5	Structured (partially supervised Whole Class- grouping)	GMEET , GOOGLE CLASS, Lecture Notes, PPT	Demonstrate database transaction processing and recovery techniques.

B. Daily Lesson Plan

Lecture	TOPIC/UNIT/ CHAPTER	Plan date	Execution date	Details of home work/assignment/mini project/ICT used/other	Details of topics that are beyond syllabus (if any)	Remarks
1.	Overview of DBMS: Definition, Application, File & Database Concepts	20.1.20	27.01.20			
2.	3 Schema architecture, Data Abstraction, Data Independence	21.1.20	3.2.20			
3.	Database Users, Database Administrator, Concepts of Instances and Schemas, Metadata, Data Dictionary, Data Models	24.1.20	5.2.20			
4.	ERD: Basic concepts, Degree and Cardinality of relationship, Types of attributes, Mapping Cardinalities	27.1.20	6.2.20			
5.	Keys: (super, candidate, primary, alternate, foreign) keys, Integrity Constraints	28.1.20	7.2.20	1. Explain the distinctions among the terms primary key, candidate key and super key.		
6.	Weak Entity sets, Participation constraints, ERD example	31.1.20	10.2.20	1. Draw an ERD		
7.	Specialization and Generalization and the Constraints on them, Aggregation	3.2.20	13.2.20			
8.	ERD example	4.2.20	14.2.20	ASSIGNMENT-1*		
9.	Design of RDBMS from ERD	6.2.20	17.2.20	Convert the ER diagram of University Database System into a relational database schema. Be certain to indicate primary keys and referential integrity constraints.		

10.	SQL: Data Languages-Procedural & Non-Procedural, Basic SQL commands: CREATE, ALTER, DROP, TRUNCATE, RENAME, Constraints: PRIMARY KEY, REFERENCIAL KEY, CHECK , NOT NULL, UNIQUE, DEFAULT	7.2.20	19.2.20			
11.	SQL commands: INSERT, UPDATE, DELETE, SELECT, WHERE, DISTINCT, AND,OR, NOT, BETWEEN, IN, LIKE,ORDER BY	10.2.20	20.2.20	<p>1. Consider the following tables:</p> <p>SALES_ORDER_DETAILS (ORDER_NO, PRODUCT_NO, QTY_ORDERED, QTY_DISPACHED)</p> <p>SALES_ORDER (ORDER_NO, CLIENT_NO, ORDER_DATE)</p> <p>CLIENT_MASTER (CLIENT_NO, NAME, BALANCE_DUE)</p> <p>PRODUCT_MASTER (PRODUCT_NO, DESCRIPTION)</p> <p>Write the following queries in SQL</p> <p>d. Retrieve the PRODUCT_NO and the total QTY_ORDERED for products 'P001' and 'P004'.</p> <p>e. Retrieve all orders placed by a client named 'RAHUL DESAI'.</p> <p>f. Find out all products that are not being sold/ ordered.</p> <p>g. Retrieve the ORDER_NO, client NAME, their ORDER_DATE in 'DD/MM/YY' format and sorted in ascending order of ORDER_DATE.</p>		
12.	Aggregate Functions, GROUP BY, HAVING, UNION, INTERSENCT, MINUS/EXCEPT	11.2.20	21.2.20			
13.	Nested sub queries using Comparison operators, IN, NOT IN, EXISTS, NOT EXISTS, ALL	13.2.20	24.2.20			
14.	SQL Queries with example	14.2.20	26.2.20			
15.	Relational Algebra Operations: select, project, Cartesian product, union, intersect, set difference	17.2.20	27.2.20			
16.	Join: inner join, outer join, assignment, rename	18.2.20	17.3.20			
17.	Generalized projection, Aggregate functions, Modifications of database: insert, update, delete	20.2.20	19.3.20			

18.	Division, Relational algebra Queries with example	21.2.20	20.3.20	<p>SUPPLIER (SUPPLIER_ID, SUPPLIER_NAME, SUPPLIER_ADDRESS)</p> <p>PARTS (PART_ID, PART_NAME, COLOR)</p> <p>CATALOG (SUPPLIER_ID, PART_ID, COST)</p> <p>Write the following queries in Relational Algebra based on above mentioned tables: (Level 1)</p> <ol style="list-style-type: none"> 1. Get the supplier who supply part id 'P2'. 2. Get the suppliers who supply at least all those part supplied by supplier 'S2'. 3. Get the color of parts supplied by supplier 'S1'. 4. Find the parts that are supplied by at least two different suppliers. 5. Find names of the suppliers who supply 'YELLOW' parts. 		
19.	Relational algebra Queries with example,	24.2.20	23.3.20			
20.	Relational Calculus: Tuple Relational Calculus with example	25.2.20	24.3.20	<p>EMPLOYEE (EMPLOYEE_NO, EMPLOYEE_NAME, CITY)</p> <p>WORKS (EMPLOYEE_NO, COMPANY_NAME, SALARY)</p> <ol style="list-style-type: none"> 1. Write the following query in both Tuple and Domain Relational Calculus. (Level 1) <ul style="list-style-type: none"> • Find the name and city of residence of all employees who work for TCS Company. • Find the name of all employees who earn more than rupees 20000/- per month. • Find the name of the company for the employees of Bangalore city. 		

				Find the name of the employees who do not belong to Bangalore city.		
21.	Domain relational Calculus with example	2.3.20	26.3.20			
22.	FD with example	3.3.20	27.3.20			
23.	Armstrongs axioms, Closure of F	5.3.20	30.3.20			
24.	Computing Closure of F examples	6.3.20	31.3.20	<p>1. Find the closure of the set of functional dependencies F. (Level 4)</p> <p>a. $F = \{A \rightarrow BC, CD \rightarrow E, B \rightarrow D, E \rightarrow A\}$</p> <p>b. $F = \{AB \rightarrow C, A \rightarrow DE, B \rightarrow F, F \rightarrow GH, D \rightarrow IJ\}$</p> <p>2. $R = [A, B, C, D, E]$ $F = \{A \rightarrow B, AB \rightarrow C, D \rightarrow AC, D \rightarrow E\}$ $E = \{A \rightarrow BC, D \rightarrow AE\}$ Are F and E equivalent?</p>		
25.	Attribute closure, Its Application, with examples	12.3.20	2.4.20			
26.	Minimal Cover theory	13.3.20	3.4.20			
27.	Minimal Cover example	16.3.20	6.4.20			
28.	Database Normalization : 1NF	17.3.20	7.4.20			
29.	2NF, 3NF, BCNF theory and example	19.3.20	9.4.20	<p>1. $R = [A, B, C, D]$ $F = \{A \rightarrow BC, B \rightarrow C, A \rightarrow B, AB \rightarrow C, AC \rightarrow D\}$</p> <p>Find whether F is irreducible.</p>		
30.	Normalization example discussion	20.3.20	10.4.20	<p>1. Patient{patient_id, patient_name, appointment_no, time, doctor}</p> <p>$F = \{patient_id \rightarrow patient_name, \{patient_id, appointment_no\} \rightarrow time, doctor, time \rightarrow appointment_no\}$</p>		

				Find the key of the relation Patient.		
31.	Normalization example discussion, Dependency Preservation Property and Lossless Join Decomposition theory and example	23.3.20	20.4.20			
32.	Lossless Join Decomposition example, MVD & 4NF theory and example	24.3.20	21.4.20			
33.	5NF theory and example	26.3.20	23.4.20			
34.	Transaction properties, states, operations, Schedule	27.3.20	24.4.20			
35.	Serializability, Test for Conflict serializability, Recoverable schedule, Cascadeless schedule	30.3.20	27.4.20			
36.	View serializability, Need for Concurrency Control	31.3.20	28.4.20			
37.	Concurrency Control Techniques: Locks, 2PL	2.4.20	4.5.20	1. Find out whether the following schedule S is conflict or serial? S: [R3(y); R3(z); R1(x); W1(x); W3(z); W3(y); R2(z); R1(y); W1(y); R2(y); W2(y); R2(x); W2(x)] If conflict then, find the equivalent serial schedule.		
38.	Deadlock, Time Stamp Protocol	3.4.20	5.5.20			
39.	Log based Recovery Techniques,	6.4.20	7.5.20			
40.	Check Points, Non-log based Recovery Techniques	7.4.20	8.5.20			
41.	Query Optimization Steps, Operator Tree Construction	9.4.20	11.5.20			
42.	Indexing Techniques: Primary , Clustered, Secondary	10.4.20	12.5.20			
43.	Multilevel Index, Problems on Indexing	13.4.20	14.5.20			
44.	B Tree Construction, Insertion, Deletion	16.4.20	15.5.20			

				1. Construct a B tree of order 3 for the following set of key values: [5, 10, 15, 20, 35, 40, 50, 65, 70, 75, 90, 95] i. Insert 60 ii. Delete 15, 75		
45.	B+ Tree Construction, Insertion, Deletion	17.4.20	18.5.20			

*Details of Assignments are given later.

*ASSIGNMENTS

Database Management System (CS 601)

Assignment 1

2020

1. Draw an ER diagram for the following application from the manufacturing industry: [CO1]
 - Each supplier has a unique name.
 - More than one supplier can be located in the same city.
 - Each part has a unique part number.
 - Each part has a color.
 - A supplier can supply more than one part.
 - A part can be supplied by more than one supplier.
 - A supplier can supply a fixed quantity of each part.
2. Consider a database used to record the marks that students get in different exams of different course offerings.
 - a. Construct an E-R diagram that models exams as entities and uses a ternary relationship, for the above database. You can make appropriate assumptions to make the specification complete.
 - b. Construct an alternative ER diagram that uses only a binary relationship between students and course offerings. Make sure that only one relationship exists between a particular student and course offering pair, yet you can represent the marks that a student gets in different exams of a course offering.
3. Design an ER diagram for keeping track of the exploits of your favourite sports team. You should store the matches played, the scores in each match, the players in each match and individual player's statistics for each match. Summary statistics should be modeled as derived attribute.
Extend the ER diagram to track the same information for all terms in a league.
4. Suppose you are given the following requirements for a simple database for the National Hockey League (NHL):
 - the NHL has many teams,
 - each team has a name, a city, a coach, a captain, and a set of players,
 - each player belongs to only one team,
 - each player has a name, a position (such as *left wing* or *goalie*), a skill level, and a set of injury records,
 - a team captain is also a player,
 - a game is played between two teams (referred to as *host_team* and *guest_team*) and has a date (such as *May 11th, 1999*) and a score (such as *4 to 2*).Construct a clean and concise ER diagram for the NHL database using the Chen notation as in your textbook. List your assumptions and clearly indicate the cardinality mappings as well as any role indicators in your ER diagram.

5. Consider the following schema: [CO2, CO3]

Suppliers (sid: integer, *sname*: string, *address*: string)

Parts (pid: integer, *pname*: string, *color*: string)

Catalog (sid: integer, pid: integer, *cost*: real)

The key fields are underlined, and the domain of each field is listed after the field name. Therefore *sid* is the key for Suppliers, *pid* is the key for Parts, and *sid* and *pid* together form the key for Catalog.

The Catalog relation lists the prices charged for parts by Suppliers.

Write the following queries in relational algebra, tuple relational calculus and domain relational calculus:

- a. Get the supplier who supply part id 'P2'.
- b. Get the name of the suppliers who supply at least one 'RED' part. (some red part)
- c. Find the *sids* of suppliers who supply some red part or are at 221 Packer Street.
- d. Find name of the supplier who supply all parts.

- e. Get the suppliers who supply at least all those part supplied by supplier 'S2'.
- f. Get the supplier who do not supply part id 'P2'.
- g. Get the total quantity total quantity of part 'P1' supplied by supplier 'S1'.
- h. Get the color of parts supplied by supplier 'S1'.
- i. Get the name of the suppliers who supply every 'BLUE' part.
- j. Find the parts that are supplied by at least two different suppliers.
- k. Find names of the suppliers who supply both 'BLUE' and 'RED' parts.
- l. Find names of the suppliers who supply only 'RED' parts.
- m. Find names of the suppliers who supply 'YELLOW' parts.
- n. Get the name of the suppliers who supply at least one 'RED' part.

(x) Teaching Strategy / Method

- 1) Taking interactive classes through different examples.
- 2) Conducting Question – answer session at the end of the class.
- 3) Real life application for better understanding.

(xa) Strategy to support weak students

- 1) To engage the weak students in habit of studying, I give them some easy questions in regular basis.
- 2) Some weak students also have the problem of forgetting what they have learnt. In my class I always give some tips on how to recall and how to write systematically.
- 3) Weak students need special attention even after college hours. I always give some extra hours to weak students.

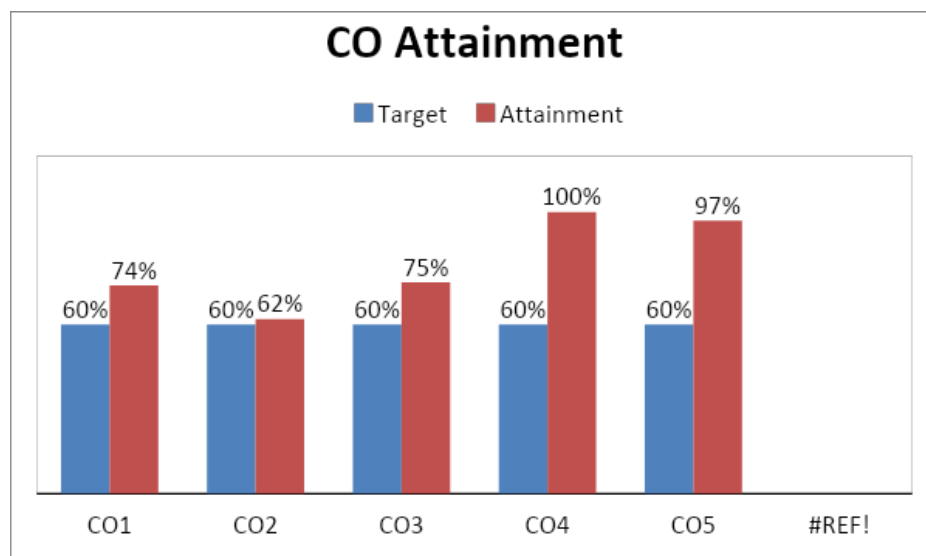
(xb) Strategy to encourage bright students

- 1) Have an extra challenge ready that allows the student to go deeper into the subject, learn a little more, or apply a skill he has just learned in a new way.
- 2) Some students are engaged with the final year students for their final projects.

(xc) Efforts to keep students engaged

- 1) Regular basis Home Work.
- 2) 5-10 minutes spent in an every class for question answer session.
- 3) Quiz on regular basis.
- 4) Some technical assignments are given group wise.

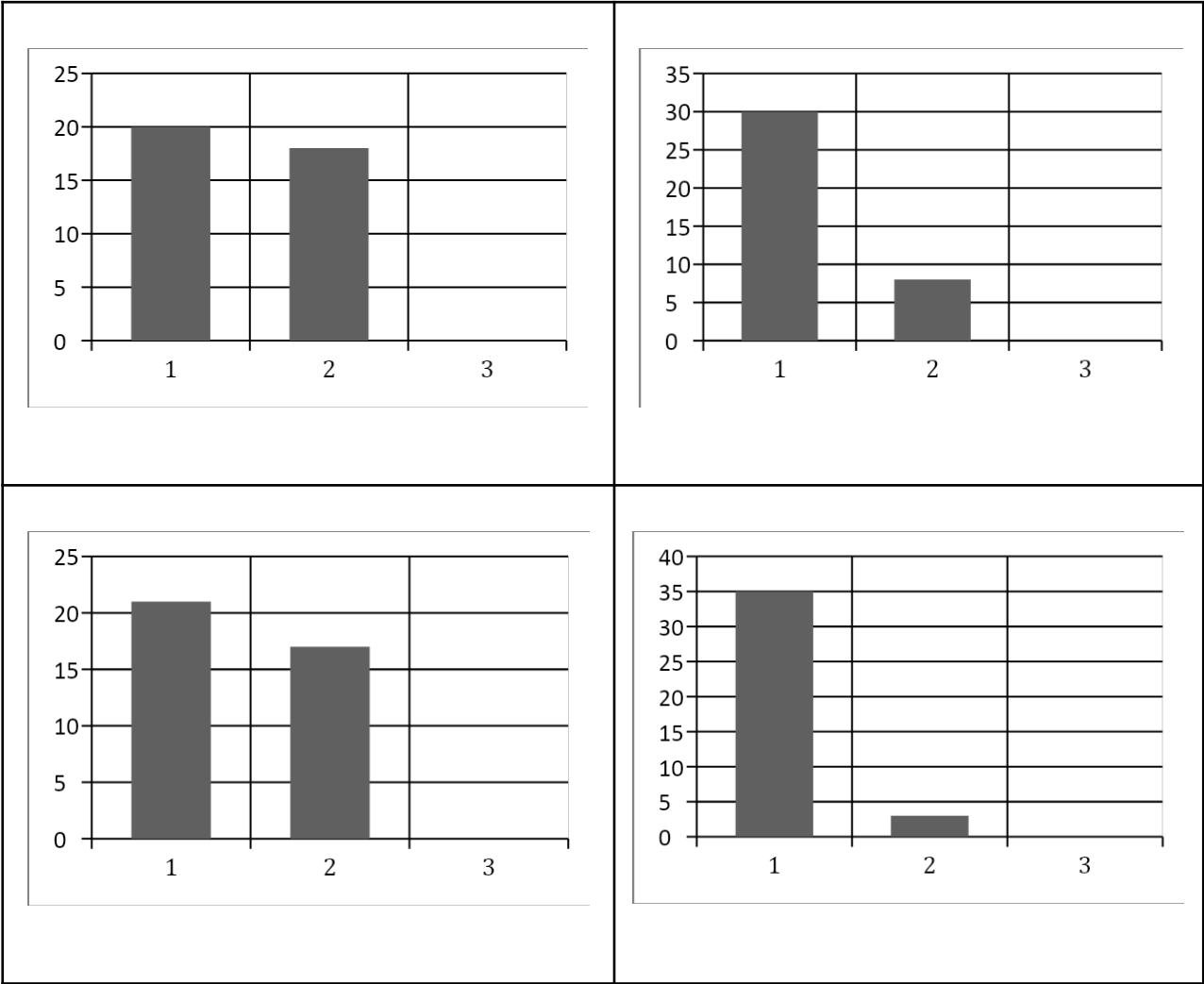
(xi) Analysis of Students performance in the course

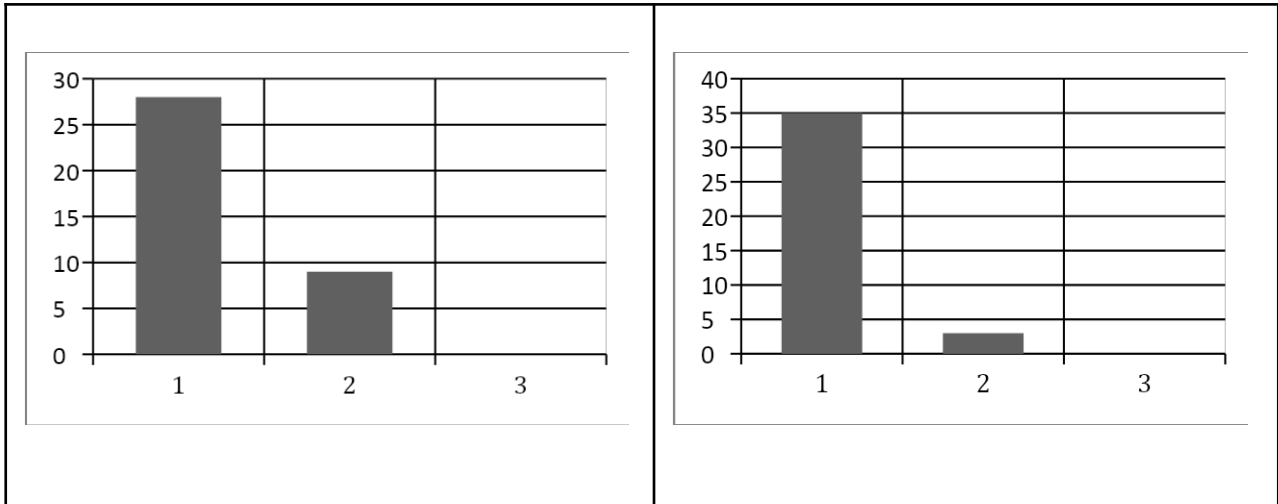


(xii) Analysis of Students performance in the course (university results)

	Target Course Outcome%	TOTAL STUDENTS	TOTAL STUDENT WHO ATTAINED OUTCOME	% STUDENTS WHO ATTAINED THE OUTCOME
University Result	60%	50	50	100

(xiii) Analysis of Student Feed Back





(xiv) Teacher Self-Assessment (at the completion of course)

From the analysis of the results obtained it can be seen that set targets for the course outcome have been achieved partially by the students. More emphasis should be given for Data Models, Relational Algebra and Calculus and Query Optimization Techniques.

(xiv) Recommendations/Suggestions for improvement by faculty

- More emphasis should be given to clear the concepts of ERD concepts and Relational Algebra and Calculus.
- Tutorials must be incorporated in the syllabus.
- Increase the total contact hours for theory to 48 hrs.

Sl .	Roll No.	Name	Attendance		Internal Examination			Assig nme nt / Quiz
			Total	Marks	1 st	2 nd	Avg.	
1	11900117055	KOUSHIK SHIL	75	3	16	25	20.5	6
2	11900117056	KIRAN KUMARI	83	4	21	28	24.5	9
3	11900117057	KAUSHIK DEY	78	3	22	27	24.5	9
4	11900117058	KARAN AGARWAL	99	5	27	24	25.5	10
5	11900117059	JAYA BANIK	79	3	23	26	24.5	8
6	11900117060	HIMANISH BHATTACHARYA	79	3	20	24	22	10
7	11900117061	GUNJAN ROY	86	4	22	23	22.5	7
8	11900117062	DIPIKA SARKAR	93	5	17	25	21	8
9	11900117063	DIPANNITA KUNDU	91	5	18	23	20.5	7
10	11900117064	DIBYA JYOTI GHOSH	75	3	18	23	20.5	8
11	11900117065	DEBRUPA BHATTACHARYA	98	5	28	24	26	10
12	11900117066	DEBALINA LAHA	79	3	19	25	22	7
13	11900117067	DEB PRAMANIK	86	4	20	22	21	10
14	11900117068	BRAJESH KUMAR MANDAL	79	3	24	24	24	8
15	11900117069	BISHAL DHAIR	98	5	20	23	21.5	10
16	11900117070	BHASKAR RAY	95	5	14	25	19.5	10
17	11900117071	BARSHAN PAL	91	5	15	25	20	10
18	11900117072	AYITIK SHOME	79	3	17	25	21	8
19	11900117073	AVISHEK ROY	84	4	15	26	20.5	8
20	11900117074	ARSALAN UMER SHAH	81	4	14	23	18.5	9
21	11900117075	ARPITA SAHA KUNDU	93	5	24	25	24.5	10
22	11900117076	ARNAB SHARMA	84	4	28	27	27.5	10
23	11900117077	ARNAB BAURI	79	3	24	28	26	5
24	11900117078	ARITRA SINHA	93	5	16	28	22	9

25	11900117079	ARITRA SAHA	91	5	28	22	25	9
26	11900117080	ARGHYA MITRA	76	3	27	23	25	9
27	11900117081	ANISH KUMAR JHA	84	4	23	27	25	7
28	11900117082	ANINDITA KAR	81	4	15	26	20.5	9
29	11900117083	ANIKET SHAW	93	5	25	24	24.5	9
30	11900117084	AMRIT RAJ	91	5	22	26	24	10
31	11900117085	AMIT BHAGAT	98	5	23	22	22.5	9
32	11900117086	AKASH KRISHNA KOLEY	86	4	24	28	26	7
33	11900117087	ADITYA SINGH	91	5	15	25	20	10
34	11900117088	ADHIRAJ PAL	84	4	22	27	24.5	7
35	11900117089	ABHISHEK SINHA	81	4	22	26	24	9
36	11900117090	ABHISHEK SHARMA	84	4	22	22	22	7
37	11900117091	ABHISHEK PRASAD	81	4	28	23	25.5	9
38	11900117092	ABHISHEK KUMAR	88	4	19	25	22	8
39	11900117093	ABHISHEK DEB	86	4	15	23	19	9
40	11900117094	ABHINAV KUMAR	91	5	28	25	26.5	9
41	11900117095	AASHUTOSH SINHA	76	3	23	22	22.5	7
42	11900118002	SUDHIR KUMAR	84	4	24	26	25	10
43	11900118003	SUBHAM NANDI	81	4	22	25	23.5	7
44	11900118004	SANCHITA DAS	93	5	27	23	25	9
45	11900118005	RIMLI SARKAR	91	5	20	22	21	8
46	11900118006	NUTAN DASGUPTA	98	5	15	25	20	7
47	11900118007	NIKITA PRASAD	86	4	18	24	21	7
48	11900118008	KRITIKA SHRESTHA	86	5	26	23	24.5	7
49	11900118009	DIPANKAR KARJEE	83	5	21	24	22.5	10
50	11900118010	ARIT MAJUMDAR	80	5	22	24	23	8

RECORDS OF ASSIGNMENTS/QUIZ
Paper Name: DATABASE MANAGEMENT SYSTEM
Paper Code: CS 601

Sl.	Roll No.	Name	A1		Sl.	Roll No.	Name	A1		
1	11900117055	KOUSHIK SHIL	1		25	11900117079	ARITRA SAHA	1		
2	11900117056	KIRAN KUMARI	1		26	11900117080	ARGHYA MITRA	1		
3	11900117057	KAUSHIK DEY	1		27	11900117081	ANISH KUMAR JHA	1		
4	11900117058	KARAN AGARWAL	1		28	11900117082	ANINDITA KAR	1		
5	11900117059	JAYA BANIK	1		29	11900117083	ANIKET SHAW	1		
6	11900117060	HIMANISH BHATTACHARYA	1		30	11900117084	AMRIT RAJ	1		
7	11900117061	GUNJAN ROY	1		31	11900117085	AMIT BHAGAT	1		
8	11900117062	DIPIKA SARKAR	1		32	11900117086	AKASH KRISHNA KOLEY	1		
9	11900117063	DIPANNITA KUNDU	1		33	11900117087	ADITYA SINGH	1		
10	11900117064	DIBYA JYOTI GHOSH	1		34	11900117088	ADHIRAJ PAL	1		
11	11900117065	DEBRUPA BHATTACHARYA	1		35	11900117089	ABHISHEK SINHA	1		
12	11900117066	DEBALINA LAHA	1		36	11900117090	ABHISHEK SHARMA	1		
13	11900117067	DEB PRAMANIK	1		37	11900117091	ABHISHEK PRASAD	1		
14	11900117068	BRAJESH KUMAR MANDAL	1		38	11900117092	ABHISHEK KUMAR	1		
15	11900117069	BISHAL DHAIR	1		39	11900117093	ABHISHEK DEB	1		
16	11900117070	BHASKAR RAY	1		40	11900117094	ABHINAV KUMAR	1		
17	11900117071	BARSHAN PAL	1		41	11900117095	AASHUTOSH SINHA	1		
18	11900117072	AYITIK SHOME	1		42	11900118002	SUDHIR KUMAR	0		
19	11900117073	AVISHEK ROY	1		43	11900118003	SUBHAM NANDI	1		
20	11900117074	ARSALAN UMER SHAH	1		44	11900118004	SANCHITA DAS	1		
21	11900117075	ARPITA SAHA KUNDU	1		45	11900118005	RIMLI SARKAR	1		
22	11900117076	ARNAB SHARMA	1		46	11900118006	NUTAN DASGUPTA	1		
23	11900117077	ARNAB BAURI	1		47	11900118007	NIKITA PRASAD	1		
24	11900117078	ARITRA SINHA	1		48	11900118008	KRIKITA SHRESTHA	1		
					49	11900118009	DIPANKAR KARJEE	1		
					50	11900118010	ARIT MAJUMDAR	1		

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Sessional/Practical Performance Record

Paper Name: DATABASE MANAGEMENT SYSTEM LAB

Paper Code: CS 691

Sl	Roll No.	Name	Marks in experimentation										Total (30)	Viva (10)	Total out of 40
			1	2	3	4	5	6	7	8	9	10			
1	11900117055	KOUSHIK SHIL	3	3	3	2	3	3	2	3	2	3	27	5	32
2	11900117056	KIRAN KUMARI	3	3	3	3	3	3	3	3	2	3	29	8	37
3	11900117057	KAUSHIK DEY	3	3	3	3	2	3	3	2	2	3	27	8	35
4	11900117058	KARAN AGARWAL	3	3	3	3	3	3	2	2	1	2	25	9	34
5	11900117059	JAYA BANIK	3	3	2	2	2	3	2	2	2	1	22	9	30
6	11900117060	HIMANISH BHATTACHARYA	3	3	2	3	2	3	2	2	2	3	25	7	32
7	11900117061	GUNJAN ROY	3	3	3	3	3	3	2	2	1	2	25	8	35
8	11900117062	DIPIKA SARKAR	3	3	3	3	2	3	3	2	2	3	27	7	37
9	11900117063	DIPANNITA KUNDU	3	3	3	3	3	2	3	3	2	3	28	8	35
10	11900117064	DIBYA JYOTI GHOSH	3	3	3	3	3	3	3	3	2	3	29	10	37
11	11900117065	DEBRUPA BHATTACHARYA	3	3	2	2	3	3	3	3	2	2	26	7	36
12	11900117066	DEBALINA LAHA	3	3	3	1	1	1	1	1	1	1	16	8	25
13	11900117067	DEB PRAMANIK	3	3	3	2	3	3	2	2	2	2	25	8	34
14	11900117068	BRAJESH KUMAR MANDAL	3	3	2	2	2	2	2	2	2	3	23	9	33
15	11900117069	BISHAL DHAIR	3	3	2	3	2	2	2	2	2	2	23	9	30
16	11900117070	BHASKAR RAY	2	2	2	2	3	3	3	3	2	3	25	10	35
17	11900117071	BARSHAN PAL	3	3	3	3	3	3	2	2	1	2	25	7	32
18	11900117072	AYITIK SHOME	3	3	3	3	2	3	3	2	2	3	27	8	37
19	11900117073	AVISHEK ROY	3	3	2	2	3	3	3	3	2	3	27	7	35
20	11900117074	ARSALAN UMER SHAH	3	3	2	3	2	2	2	2	2	3	24	7	31
21	11900117075	ARPITA SAHA KUNDU	3	3	3	2	3	3	2	2	2	2	25	9	34
22	11900117076	ARNAB SHARMA	3	3	3	3	2	3	3	2	2	3	27	9	34
23	11900117077	ARNAB BAURI	3	3	3	2	3	3	1	2	1	2	23	7	32
24	11900117078	ARITRA SINHA	3	3	3	3	2	3	3	2	2	3	27	10	36

Sessional/Practical Performance Record

Paper Name: DATABASE MANAGEMENT SYSTEM LAB

Paper Code: CS 691

Sl	Roll No.	Name	Marks in experimentation										Total	Viva	Total out of 40
			1	2	3	4	5	6	7	8	9	10			
25	11900117079	ARITRA SAHA	2	2	3	3	3	3	3	3	3	3	28	8	36
25	11900117079	ARITRA SAHA	3	2	3	2	3	2	3	2	2	3	25	7	34
26	11900117080	ARGHYA MITRA	3	3	3	2	2	1	2	2	1	2	21	9	30
27	11900117081	ANISH KUMAR JHA	3	3	3	3	2	3	3	2	2	3	27	7	37
28	11900117082	ANINDITA KAR	2	2	3	2	3	2	3	3	2	3	25	9	34
29	11900117083	ANIKET SHAW	3	3	3	3	2	3	3	3	2	3	28	9	38
30	11900117084	AMRIT RAJ	3	3	3	3	3	3	3	3	2	3	29	7	37
31	11900117085	AMIT BHAGAT	3	3	3	3	3	3	3	3	2	3	29	10	39
32	11900117086	AKASH KRISHNA KOLEY	3	3	2	3	3	2	2	2	2	2	24	10	33
33	11900117087	ADITYA SINGH	3	3	3	2	2	3	3	2	2	3	26	8	35
34	11900117088	ADHIRAJ PAL	3	3	2	2	2	2	2	2	2	2	22	9	31
35	11900117089	ABHISHEK SINHA	3	2	2	3	2	2	2	2	2	2	22	10	32
36	11900117090	ABHISHEK SHARMA	2	2	2	3	3	2	3	3	2	3	25	7	34
37	11900117091	ABHISHEK PRASAD	2	2	1	2	1	2	2	2	2	2	18	9	27
38	11900117092	ABHISHEK KUMAR	3	3	2	3	2	2	2	2	2	2	23	8	30
39	11900117093	ABHISHEK DEB	3	3	2	3	2	3	3	2	2	2	25	7	33
40	11900117094	ABHINAV KUMAR	2	2	2	2	2	2	2	2	2	2	20	7	28
41	11900117095	AASHUTOSH SINHA	2	2	2	2	2	3	2	2	2	1	20	10	29
42	11900118002	SUDHIR KUMAR	3	3	2	3	2	3	2	2	2	3	25	7	35
43	11900118003	SUBHAM NANDI	3	3	3	3	3	3	2	2	1	2	25	8	35
44	11900118004	SANCHITA DAS	3	3	3	3	2	3	3	2	2	3	27	7	35
45	11900118005	RIMLI SARKAR	3	3	3	3	3	2	3	3	2	3	28	5	33
46	11900118006	NUTAN DASGUPTA	3	3	3	3	3	3	3	3	2	3	29	8	38
47	11900118007	NIKITA PRASAD	3	3	2	2	3	3	3	3	2	2	26	7	34
48	11900118008	KRITIKA SHRESTHA	3	3	3	2	3	3	2	2	2	2	25	9	32
49	11900118009	DIPANKAR KARJEE	3	3	3	1	1	1	1	1	1	1	16	5	21
50	11900118010	ARIT MAJUMDAR	3	3	3	3	3	3	3	3	2	3	29	8	37

NAME WITH ROLL NO.s OF STUDENT WHOSE ACADEMIC PERFORMANCE IS NOT SATISFACTORY

Sl.	Roll No.	Name of Student	Remedial measures taken by teacher
1	11900117055	KOUSHIK SHIL	Doubt Clearing Classes Taken
2	11900118009	DIPANKAR KARJEE	

CERTIFICATE

I, the undersigned, have completed the course allotted to me as shown below

Sl. No.	Semester	Subject with Code	Total Units/ Chapters	Remarks

Date :	Signature of Faculty
--------	-----------------------------

Submitted to HOD
Certificate by HOD
I, the undersigned, certify that.....has completed the course work allotted to him/ her satisfactorily/ not satisfactorily.

Date :	Signature of HOD
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Submitted to Principal/Director
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Date :	Signature of Principal/Director
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