DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY,
LONERE – RAIGAD -402 103
Semester Winter Examination – December - 2019

Branch: Computer Science and Engineering **Sem.:- 5th**
Subject with Subject Code:-Database Systems BTCOC501 **Marks: 60**
Date:-09/12/2019 **Time:- 3 Hr.**

Instructions to the Students

1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc. wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

			Marks
Q. 1	a)	Explain the difference between two-tier and three-tier architectures. Which is better suited for Web applications? Why?	(6)
	b)	Construct an E-R diagram for a car insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents. Each insurance policy covers one or more cars, and has one or more premium payments associated with it. Each payment is for a particular period of time, and has an associated due date, and the date when the payment was received.	(6)
Q. 2	a)	Let the following relation schemas be given $R = (A, B, C)$, $S = (A, D, E)$ Let relations r (R) and s (S) be given. Give an expression in SQL that is equivalent to each of the following queries. (1) $\Pi_{A,E}(\sigma_{C=D}(r \times s)$ (2) $r \bowtie s$ (3) $\Pi_A(r) \cap \Pi_A(s)$	(6)
	b)	Consider the following database Student(name, s_no, class, major) Course(c-name, c_no, credit_hours, department) Write SQL statements to do the following update on the database schema (1) Insert a new student,<'Johnson',25,1,'Math'>,in the database. (2) Change the credit_hours of course 'Data Science' to 4.	(6)

(3) Delete the record for the student whose name is 'Smith' and whose student number is 17.

Q. 3 a) Compute the closure of the following set F of functional dependencies for relation schema (6)

r (A, B, C, D, E).

$A \rightarrow BC$

$CD \rightarrow E$

$B \rightarrow D$

$E \rightarrow A$

List the candidate keys for R.

b) Illustrating the concept of fully functional dependency, explain 2NF with example. (6)

Q. 4 a) Let relations r1(A, B,C) and r2(C, D, E) have the following properties : r1 has 20,000 tuples, r2 has 45,000 tuples, 25 tuples of r1 fit on one block, and 30 tuples of r2 fit on one block. (6)
Estimate the number of block transfers and seeks required, using each of the following join strategies for r1 ⋈ r2: (r1 Natural Join r2)

1. Nested-loop join.
2. Block nested-loop join.

b) Explain Query processing? Explain various steps in query processing with the help of neat sketch. (6)

Q. 5 a) Construct a B+-tree for the following set of key values: (6)
(2, 3, 5, 7, 11, 17, 19, 23, 29, 31)
Assume that the tree is initially empty and values are added in ascending order. Construct
B+ tree for the cases where the number of pointers that will fit in one node is as follows:
i. Four ii. Six

b) Define ordered indices. Differentiate between Dense and sparse indices with suitable example. (6)

Q. 6 Write short note on following : (12)
(1) ACID properties of transaction
(2) View serializable schedule

Paper End

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY,
LONERE – RAIGAD -402 63
Semester Examination – December - 2019

Branch: Information Technology **Sem.:-V**
Subject with Subject Code:- Database Management System(BTITC501) **Marks: 60**
Date:- 09/12/2019 **Time:- 3 Hr.**

Instructions to the Students

1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately Assume it and should mention it clearly

		(Marks)
Q1. A)	Explain data abstraction and different data models in DBMS	6M
B).	Explain different advantages of DBMS over file processing systems	6M
Q2. A)	From given tables, write relational algebra expressions for following branch (branch_name, branch_city, assets) customer (customer_name, customer_street, customer_city) account (account_number, branch_name, balance) loan (loan_number, branch_name, amount) depositor (customer_name, account_number) borrower (customer_name, loan_number) a. Find all loans of over Rs.6000 b. Find the loan number for each loan of an amount greater than Rs.50000 c. Find the names of all customers who have a loan, an account, or both, from the bank d. Find the names of all customers who have a loan and an account at the bank e. Find names of customer who have an account in all branches located at Aurangabad. f. Find name of customer who lives in pune	1*5=6M
B)	Explain unary and binary operations in relational algebra.	6M
Q3. A)	Explain DDL, DML and DCL commands with suitable examples.	6M
B)	From given tables , write SQL queries for following Salesman(s_id, name, city, commission) Customer(c_id, c_name, city, grade, s_id) Orders(o_no, amount, date_of_order, customer_id) a. Find out name of customer for each order b. Find out name of customer, who has placed 2nd highest amount of order c. Find out names of customers who have who have placed order of higher amount than Ram. d. Find out city wise count of customers. e. Find out names of customers who lives in same city as that of salesman f. Find c_id,s_id and date for each order.	1*5=6M

Q4. A)	Explain RAID in detail	6M
B)	Explain normalization with different normal forms with suitable example.	6M
Q5. A)	Explain ACID properties of transaction using suitable examples	6M
B)	Explain different aggregate functions in SQL with suitable examples.	6M
Q6. A)	Explain different concurrency control protocols	6M
B)	Write short note on backup and recovery systems	6M

Paper End

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary End Semester Examination – Summer Semester 2023

Course: B. Tech. **Branch: Computer /CSE** **Semester: V**

Subject Code & Name: (BTCOC501) Database System

Max Marks: 60 **Date:07/08/2023** **Duration: 3 Hr.**

- ***Instructions to the Students:***
  1. *All the questions are compulsory.*
  2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
  3. *Use of non-programmable scientific calculators is allowed.*
  4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve any two of the following.**		
A)	**Illustrate the database characteristics. How they are different from File systems.**	**L 2**	**6 M**
B)	**Illustrate about integrity and key constraints with suitable examples?**	**L3**	**6 M**
C)	**Explain the importance of Null values in Relational Model.**	**L2**	**6 M**
Q.2	**Solve all two of the following.**		
A)	**Explain in detail, the form of a basic SQL query with a suitable example.**	**L2**	**6 M**
B)	**List out various SET comparison operator in SQL and also write about its use in writing SQL queries.**	**L3**	**6 M**
Q. 3	**Solve any two of the following.**		
A)	**Write SQL Queries for the following set of tables:**	**L3**	**6 M**

account(account_number, branch_name, balance)
branch (branch_name, branch_city, assets)
customer (customer_name customer_street, customer_city)
loan (loan_number, branch_name, amount)
depositor((customer_name, account_number)
borrower(customer_name, loan_number)

a. **For all customers who have a loan from the bank, find their names and loan numbers with the attribute loan_number replaced by loan_id.**
b. **Find the names of all customers whose street address includes the substring 'Main'.**
c. **List loan data, ordered by decreasing amounts, then increasing loan numbers.**

B) **Write SQL Queries for the following set of tables:** **L3** **6 M**

EMPLOYEE (FNAME, MINIT, LNAME, SSN, BDATE, ADDRESS, SEX, SALARY, #SUPERSSN, #DNO),
DEPARTMENT (DNAME, DNUMBER, #MGRSSN, MGRSTARTDATE),
DEPT_LOCATIONS (#DNUMBER, DLOCATION),
PROJECT (PNAME, PNUMBER, PLOCATION, #DNUM),
WORKS_ON (#ESSN, #PNO, HOURS),
DEPENDENT (#ESSN, DEPENDENT_NAME, SEX, BDATE, RELATIONSHIP)

a. **Retrieve the name and address of all employees who work for the 'Research' department**
b. **Retrieve the birthdate and address of the employee(s) whose name is 'Raj V Naik'**
c. **Retrieve all the attributes of an EMPLOYEE and the attributes of the DEPARTMENT he or she works in for every employee of the 'Research' department**

C) **By considering an example describe various data update operations in SQL.** **L2** **6 M**

Q.4 **Solve all two of the following.**

A) **State BCNF. How does it differ from 3NF?** **L2** **6 M**

B) **Explain insertion, deletion and modification anomalies with suitable examples.** **L2** **6 M**

Q. 5 **Solve any two of the following.**

A) **Explain in detail about internal hashing Techniques.** **L2** **6 M**

B) **Discuss in detail about cluster and Multilevel indexes.** **L2** **6 M**

C) **Explain Concurrency control with locking methods.** **L2** **6 M**

***** End *****

	DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE **Supplementary Examination – Summer 2022** **Course: B. Tech.** **Branch : Computer Science & Engineering** **Semester :VI** **Subject Code & Name: (BTCOC501), Database Systems** **Max Marks: 60** **Date:** **Duration: 3 Hr.**		
	Instructions to the Students: *1. All the questions are compulsory.* *2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.* *3. Use of non-programmable scientific calculators is allowed.* *4. Assume suitable data wherever necessary and mention it clearly.*		
		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		
A)	Explain purpose of database system.	**Remembering**	**6**
B)	Explain Data Abstraction.	**Understanding, applying**	**6**
C)	Explain data storage & Querying.	**Understanding**	**6**
Q.2	**Solve Any Two of the following.**		
A)	Give formal definition of tuple relational calculus and explain it.	**Remembering**	**6**
B)	Explain aggregation in relational algebra.	**Understanding, applying**	**6**
C)	Explain domain relational calculus.	**Remembering**	**6**
Q. 3	**Solve Any Two of the following.**		
A)	Consider following schema & Solve following queries by SQL. Instructor (id, name, department name, salary) Teaches (id, course_id, sec_id, semester, year) Course (couse_id, tittle, department name, credits) Department(department name, building, budget) a. Find the set of all courses taught in summer 2020 semester but not in winter 2021. b. List the names of instructor with salary amounts between 90000 and 100000.	**Understanding, analyze**	**6**
B)	Explain aggregation with example.	**Remembering**	**6**
C)	Explain Function and procedure with example.	**Understanding, analyze**	**6**
Q.4	**Solve Any Two of the following.**		

A)	Construct B^+ tree for the given set of key values (2,3,5,7,11,17,19,23,29,31) using four & six pointers that will fit in one node.	**Understading, applying**	**6**
B)	Suppose that we are using extendable hashing on a file that contains records with the following search key values (2,3,5,7,11,19,23,29,31) show the extendable hash structure for this file if the hash function is h(x) = x mod 8 and buckets can hold three records.	**Understanding, applying**	**6**
C)	Explain BCNF.	**Understanding, analyze**	**6**
Q. 5	**Solve Any Two of the following.**		
A)	Explain ACID properties of transaction.	**Remembering**	**6**
B)	Explain serializability.	**Understanding, analyze**	**6**
C)	Explain deadlock handling.	**Understanding,**	**6**
	***** End *****		

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	DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE **Winter Examination – 2022** **Course: B. Tech. Branch : CSE Semester : V** **Subject Code & Name: BTCOC501** **Max Marks: 60 Date:28/01/2023 Duration: 3 Hr.**		
	Instructions to the Students: *1. All the questions are compulsory.* *2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.* *3. Use of non-programmable scientific calculators is allowed.* *4. Assume suitable data wherever necessary and mention it clearly.*		
		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	Why would you choose a database system instead of simple storing data in file processing system? Compare file processing system and DBMS.	**L1,L2/CO 1**	**6**
B)	Define an Entity and Attribute. Explain the different types of attributes that occur in an ER diagram model, with an example.	**L2/CO1**	**6**
C)	Draw an E-R diagram of Banking system taking into account at least five entities, indicate all keys, constraints and assumptions that are made.	**L3/CO1**	**6**
Q.2	**Solve Any Two of the following.**		**12**
A)	Define and differentiate the following relational algebra operators with suitable example: (i) Cartesian product (ii) Natural join	**L1,L2/ CO2**	**6**
B)	Consider the following relational schema. Suppliers(sid, sname, address) Parts(pid, pname, address) Catalog(sid, pid, cost) (i) Write relational algebra query to find the names of suppliers who supply some red part (ii) Write relational algebra query to find the sid of suppliers who supply some red or green parts	**L3,L5/ CO2**	**6**
C)	Consider the following employee database. Give expression in tuple relational calculus for each of the following queries. employee(employee_name,street,city) works(employee_name,company_name,salary) company(company_name,city) manages(employee_name,manager_name) (i)Find the names of all employees who work for First Bank Corporation.	**L3,L5/ CO2**	**6**

	(ii)Find the names and cities of residence of all employees who work for First Bank Corporation (iii)Find all employees who live in the same city as that in which the company for which the work is located.		
Q. 3	**Solve Any Two of the following.**		**12**
A)	Consider the following schema and solve following queries using SQL. employee (emp_no, name, skill ,pay_rate) position (posting_no, skill) duty-allocation (posting_no, emp_no, day, shift) (i) Get duty allocation details for emp_no 123461 for the month of april 1986. (ii) Get employees whose rate of pay is more than or equal to the rate of pay of employee 'XYZ'. (iii) Get the names and pay rates of employees with emp_no less than 123460 whose rate of pay is more than the rate of payoff atleast one employee with emp_no greater than or equal to 123460.	**L3,L5/ CO2**	**6**
B)	Consider the following relational schema. Weather (city, temperature, humidity, condition) Location (city, country) Write the following queries in SQL: (i) Find all the tuples having temperature greater than that of Paris. (ii) Find the names of those cities with temperature and condition whose condition is neither Sunny nor Cloudy but temperature must be greater than 70. (iii) Find all the cities with temperature, condition and humidity, whose humidity is in the range of 63 to 79.	**L3,L5/ CO2**	**6**
C)	What is view? What are its advantages? Explain views in SQL with suitable example.	**L2/ CO2**	**6**
Q.4	**Solve Any Two of the following.**		**12**

A)	What is Normalization? Explain the importance of normalization.What is the criteria for good relation design?	**L2/ CO3**	**6**
B)	Explain BCNF with suitable example and distinguish between BCNF and 3NF. Is relation R(student_no, course_no,instr_no) with F = { {student_no, course_no} → instr_no, instr_no→ course_no} in BCNF and 3NF? Justify your answer.	**L2,L3,L4/ CO3**	**6**
C)	Consider the relation schema R=(A,B,C,G,H,I) and Set of functional dependencies: $A \rightarrow B$ $A \rightarrow C$ $CG \rightarrow H$ $CG \rightarrow I$ $B \rightarrow H$ Compute $(AG)^+$.Is it candidate key? Justify your answer.	**L3,L4/ CO3**	**6**
Q. 5	**Solve Any One of the following.**		**12**
A)	Explain ACID properties in detail	**L2/CO5**	**6**
B)	What are ordered indices? Explain with suitable example. Distinguish between dense index and sparse index.	**L2,L4/ CO4**	**6**
C)	Construct a B+-tree for the following set of key values: (2, 3, 5, 7, 11, 17, 19, 23, 29, 31) Assume that the tree is initially empty and values are added in ascending order. Construct B+-trees for four pointers that will fit in one node	**L3/ CO4**	**6**
	***** End *****		

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DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Summer Examination – 2023

Course: B. Tech. Branch : Electronics & Computer Engineering Semester :IV

Subject Code & Name: Database Management System (BTECPC402)

Max Marks: 60 Date: 15.07.2023 Duration: 3 Hr.

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level / CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	With help of a diagram, explain the difference between 2-tier and 3-tier architecture. Justify which architecture is better suited for web applications?	**02/CO1**	**6**
B)	Describe with a diagram the level of abstractions available in database systems.	**02/CO1**	**6**
C)	Describe the components of a a) Query Processor b) Storage Processor	**02/CO1**	**6**
Q.2	**Solve Any Two of the following.**		**12**
A)	Write SQL commands, *i. To Create table for following schema: Student {Roll-No (PK), Name, Class, DOB}* *ii. To add new column percentage to student table.* iii. *To drop column DOB from student table.*	**03/CO2**	**6**
B)	Consider an *EMPLOYEE* table having *Eid, Name, Age, Address, and Salary.* Using subqueries, write a query to *i) Display all details where Salary>45000* *ii) Delete all the records of employee whose age<20.* iii) *Display name & salary of employee having second highest salary.*	**03/CO2**	**6**
C)	Explain Inner, Left Outer and Right Outer Joins with suitable example.	**02/CO2**	**6**
Q. 3	**Solve Any Two of the following.**		**12**
A)	What is Normalization? Explain various anomalies with suitable example.	**02/CO3**	**6**
B)	A company has following entities and respective attributes, where EmpPhone is a multivalued and Address is a composite attribute. Draw the ER-Diagram for the same;	**03/CO3**	**6**

Entity	***Attributes***
Employee	*EmpId, EmpName, Gender, DoJ, Designation, EmpSal*
Contact Details	*EmpPhone, EmpMailID, Address*
Department	*DepId, DepName, DepLocation, DepHead.*
Project	*ProjId, ProjName, ProjLocation,ProjDuration*

C)	Solve the following a. Find the Primary & Non-Primary Attributes of ***R (A,B,C,D,E) FD: {A → BCDE, BC → ACE, D → E}*** b. Identity whether the given equations is in 2NF or not ***R (A,B,C,D) FD: {AB → CD, C → A, D → B}***	**03/CO3**	**6**
Q.4	**Solve Any Two of the following.**		**12**
A)	Draw a state diagram and discuss the typical states that a transaction goes through during execution.	**03/CO4**	**6**
B)	What is concurrency control? Explain lock based protocols for concurrency control.	**02/CO4**	**6**
C)	Describe shortly a) Database Recovery Techniques b) Causes of Database failures	**02/CO4**	**6**
Q. 5	**Solve Any Two of the following.**		**12**
A)	State the CAP theorem. Explain each term of CAP with suitable example.	**01/CO5**	**6**
B)	Describe the concept of Document and Collection in MongoDB.	**02/CO5**	**6**
C)	For MongoDB, write a query to a) Create a collection named ***Library*** b) Create a document named *using data given below* *BN101, "Database System Concepts", "Henry Korth", 800.50.* c) Insert the following book details using single query. *BN102, "Core Java", "Nageswara Rao", 650.75.* *BN103, "Let Us C", "Balaguruswamy", 400.50.* *BN104, "DBMS", "G.D. Patil", 250.5* d) Retrieve / Display all the above documents e) Update the Author name to "Y Kanetkar" for BookId BN103 f) Delete a document with BookId BN104.	**03/CO5**	**6**

***** End *****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Course: B. Tech. **Branch : AI&DS** **Semester :IV**

Subject Code & Name: DBMS BTAIC402

Max Marks: 60 **Date: 18/08/2022** **Duration: 3.45 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		
A)	What is DBMS? Explain the need of DBMS. Write any 3 application of DBMS.	**Understand**	**6**
B)	What is RDBMS? Explain data model of RDBMS. Define Schema and instances with suitable example.	**Understand**	**6**
C)	Explain Client/Server Architecture of DBMS.	**Understand**	**6**
Q.2	**Solve Any Two of the following.**		
A)	Explain following types of joins in SQL with suitable example. i) Inner Join ii) Left Outer Join iii) Natural Join	**Understand**	**6**
B)	What is the need of Normalization? Write necessary conditions for 1NF,2NF,3NF and BCNF.	**Understand**	**6**
C)	Consider the following relational schema and write following SQL query.	**Apply**	**6**

Student:

RollNo	Name	SDepartment	Class	Address

Teacher:

Tid	TName	TDepartment	Salary

Teaches:

Tid	Subjects_teaching	Class	Branch

i) Find all the teachers name whose salary is greater than 70000.

ii) Update Department ETC to ECE for all students belonging to ETC.

iii) Find all students from class TY and Department AIDS whose address is "Pune".

iv) Find total number of teachers from each department.

v) Find the name of the teacher who is teaching DBMS to Roll No CS3031

vi) Rename "Department" column in Students table to "Branch".

Q. 3	**Solve Any Two of the following.**		
A)	Differentiate between RDBMS and NoSQL databases.	**Understand**	**6**
B)	Describe the properties of Key-Value Store	**Understand**	**6**
C)	Describe distributed database system with suitable diagram.	**Understand**	**6**
Q.4	**Solve Any Two of the following.**		
A)	Draw Cassandra Architecture with various components. Explain each component in brief.	**Understand**	**6**
B)	Consider the following JSON document schema and answer the MongoDB queries	**Apply**	**6**

```
{ "_id" : 1,
    "name" : "Arav",
    "age" : 21,
    "city" : "Aurangabad",
    "subjects" : [
        "DA",
        "java",
        "dbms" ],
    "cmarks" : {
        "DS" : 20,
        "DA" : 12},
    "roll" : 1
}
```

i) Create collection Student under "College" Database.
ii) Insert above schema in "student" collection.
iii) Show all the records in "student" collection.
iv) Update city of roll=1 to "Latur".
v) Find names and roll numbers of students whose age is greater than 20.
vi) Update DS marks of roll=3 to 18.

C)	Write a suitable example for following Cassandra operation (Query). i) Creating keyspace with replication factor 3. ii) Inserting records in a table under keyspace. iii) Updating values in tables. iv) Deleting particular record in table. v) Dropping a keyspace. **vi)** Truncate a table.	**Apply**	**6**
Q. 5	**Solve Any Two of the following.**		
A)	Explain various graph representation techniques (data structures) with suitable examples.	**Understand and Apply**	**6**
B)	Explain properties of graph database model.	**Understand**	**6**
C)	Write a short note of Redis.	**Understand**	**6**

***** End *****

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DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular/Supplementary Summer Examination – 2023

Course: B. Tech. Branch : CSE(AI&DS)/AI&DS Semester : IV

Subject Code & Name: BTAIC402 Database Management System

Max Marks: 60 Date: 15-7-2023 Duration: 3 Hr.

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	What is DBMS? Explain the need of DBMS. Write any 3 application of DBMS	**R/CO1**	**6**
B)	What are the disadvantages of file processing system?	**R/CO1**	**6**
C)	With the help of block diagram, describe the basic architecture of a database management system.	**R/CO1**	**6**
Q.2	**Solve Any Two of the following.**		**12**
A)	Define Normalization. Explain1NF, 2NF, 3NFwithexample.	**KCO2**	**6**
B)	What is ER model? Explain various symbols/componentsused in ER diagram.	**U/CO2**	**6**
C)	Explain in detail the Data Model and its types.	**U/CO2**	**6**
Q. 3	**Solve Any Two of the following.**		**12**
A)	Differentiate between RDBMS and NoSQL databases.	**K/CO3**	**6**
B)	Explain in detail about CAP theorem.	**U/CO3**	**6**
C)	Describe the properties of Key-Value Store.	**U/CO3**	**6**
Q.4	**Solve Any Two of the following.**		**12**
A)	Discuss characteristics of columnar databases.	**U/CO4**	**6**
B)	Describe distributed database system with suitable diagram	**U/CO4**	**6**
C)	Elaborate suitable use cases of document databases.	**A/CO4**	**6**
Q. 5	**Solve Any Two of the following.**		**12**
A)	Explain various graph representation techniques (data structures) with suitable examples.	**U/CO5**	**6**
B)	Explain LSM trees in detail.	**U/CO5**	**6**
C)	Explain properties of graph database model.	**U/CO5**	**6**

***** End *****

	SHREE SIDDHESHWAR WOMEN'S COLLEGE OF ENGINEERING, SOLAPUR **Preliminary Examination – 2023-24** **Course: T.Y (A Div) Branch: CSE Semester: V** **Subject Code & Name: BTCO501 Database System** **Max Marks: 60 Date: Duration: 3 Hr.**		
	Instructions to the Students: *1. All the questions are compulsory.* *2. Each question carries 12 marks.*		
		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	Explain data abstraction and different data models in DBMS	**L2/CO1**	**6**
B)	Explain different advantages of DBMS over file processing system.	**L2/CO1**	**6**
C)	Define DBMS. List component of DBMS.	**L1/CO1**	**6**
Q.2	**Solve Any Two of the following.**		**12**
A)	Explain unary and binary operations in relational algebra	**L5/CO2**	**6**
B)	Explain Inner Join & Outer Join in Details	**L5/CO2**	**6**
C)	1. Let the following relation schemas be given: R = (A, B, C) S = (D, E, F) Let relations r(R) and s(S) be given. Give an expression in the tuple relational calculus that is equivalent to each of the following: a. $\Pi_A(r)$ b. $\sigma_{B=17}(r)$ c. $r \times s$ d. $\Pi_{A,F}(\sigma_{C=D}(r \times s))$	**L4/CO2**	**6**
Q. 3	**Solve Any Two of the following.**		**12**
A)	Explain group by, having clause of SQL with example	**L5/CO3**	**6**
B)	What is view? How to create & Delete view.	**L2/CO3**	**6**
C)	From given tables, write SQL queries for following Salesman(s_id, name, city , commission) Customer (c_id, c_name, city, grade, s_id) Orders (o_no, amount, date_of_order, customer_id) a.Find out name of customer for each order b.Find out name of customer, who has placed 2nd highest amount of order	**L4/CO3**	**6**

	c.Find out names of customers who have placed order of higher amount than Ram d.Find out city wise count of customers e.Find out names of customers who lives in same city as that of salesman f.Find c_id,s_id and date of each order		
Q.4	**Solve Any Two of the following.**		**12**
A)	Demonstrate B+ tree of order 3 with the following data(key) (2,3,5,7,11,17,19,23,31)	**L4/CO4**	**6**
B)	Write a short note on: i) 1NF ii) BCNF iii) 4NF	**L1/CO4**	**6**
C)	Define ordered indices. Differentiate between dense indices and sparse indices with suitable example.	**L3/CO4**	**6**
Q. 5	**Solve Any Two of the following.**		**12**
A)	What is need of lock in DBMS? Explain shared lock and exclusive lock with the help of example.	**L2/CO5**	**6**
B)	Explain transaction process state diagram.	**L5/CO5**	**6**
C)	Explain different concurrency control protocols.	**L5/CO5**	**6**
	***** End *****		

SHREE SIDDHESHWAR WOMEN'S COLLEGE OF ENGINEERING

Computer Science and Engineering Department

Preliminary Examination

Course: TY.B. Tech-CSE **Sem-VII**

Subject Name: Database System **Subject Code:BTCOC501**

Max Marks: 60 **Date:** **Duration: 3Hrs**

	Inst-ructions: 1) Each Question carries 12 marks. 2) Assume the suitable data wherever necessary and mention it clearly.	CO	Level	Marks
Q.1	Attempt any TWO. a)Explain E-R Model with the help of example. b)Explain Codd's Rule c)Define attributes Explain Types of attributes with digrams.	 CO1 CO1 CO1	 L2 L2 L2	 06 06 06
Q.2	Attempt any TWO. a) Explain following with respect to relational algebra: a. Natural Join b. Equi join c. left outer join d. full outer join b) Explain domain relational calculus with the help of example c) List and explain with the help of examples fundamental operations in relational algebra.	 CO2 CO2 CO2	 L3 L2 L3	 06 06 06
Q.3	Attempt any TWO. a) Given a set of FDs for the relation schema R (A,B,C,D) with Primary key AB, and D $\rightarrow$ C or C $\rightarrow$ D or AC $\rightarrow$ D or AD $\rightarrow$ C or BC $\rightarrow$ D or BD $\rightarrow$ C. In which normal form is R? b) What is Redundancy? Explain the anomalies in relational database c) Define ordered indices. Differentiate between dense indices and sparse indices with suitable example.	 CO3 CO3 CO3	 L2 L4 L2	 06 06 06
Q.4	Attempt any TWO. a)List syntax of UPDATE and ALTER command. Demonstrate with suitable example b) Explain B+ tree with an example and how insertion works? c) Make a comparison of hash file organization with heap file organization.	 CO4 CO4 CO4	 L2 L2 L2	 06 06 06
Q.5	Attempt any TWO. a) What is need of lock in DBMS? Explain shared lock and exclusive lock with the help of example. b) Write a short note on multiple granularity. c) Explain different concurrency control protocols.	 CO5 CO5 CO5	 L2 L6 L3	 06 06 06

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DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular & Supplementary Winter Examination-2023

Course: B. Tech

Branch : Computer Engineering / Computer Science and Engineering

Semester :V

Subject Code & Name: BTCOC501 **Database Systems**

Max Marks: 60 **Date:01-01-24** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	Solve Any Two of the following.		12
A)	We develop database applications directly on top of file systems. But some problems arise because of this, Discuss those problems.	CO1/3	6
B)	Explain two tier and three tier architectures of DBMS with schematic diagram and mention at least 1 example of each.	CO1/2	6
C)	Draw the symbols of ER Diagram. Draw ER Diagram for Library Management System.	CO1/2	6
Q.2	Solve Any Two of the following.		12
A)	What is Relational algebra? Explain basic operations along with symbols of Relational Algebra.	CO2/2	6
B)	Write Relational Algebra Queries for following. Note: Consider Relational Table - Account(Acno, AcName, Br_name, Amount). a) To display all tuples from Accounts table. b) To display Acno, AcName from accounts. c) To display the tuples for the account whose amount>25000 and Br_name=”Dharashiv) d) To display Acno, AcName, Amount From Account where the amount>50000	CO2/3	6
C)	Explain Equijoin, left join and right join with suitable example and write proper relational algebraic query for each of them.	CO2/2	6
Q. 3	Solve Any Two of the following.		12
A)	Mention different SQL languages. Explain their purpose with suitable SQL commands.	CO3/1,2	6
B)	Write the SQL Queries for the following.	CO3/3	6

a) Creating, Using, showing and deleting databases.
b) To create BOOK table with Bkid, Title, Author, branch, cost and date of publishing. (Assume proper data type for each column).
c) Write query to insert 2 valid rows of values into the BOOK table.
d) Write query to increase the length of Title and Author.
e) Write query to list books with cost less than 100.
f) Write query to list all books with title "RDBMS".

C) Consider the following schema: CO3/3 6

Suppliers (sid : integer, sname : string, address : string)
Parts (pid : integer, pname : string, color : string)
Catalog (sid : integer, pid : integer, cost : real)

Write query for the following

a) To create above tables
b) Find the name of suppliers who supply some red parts
c) Find the sids of suppliers who supply some red or green parts
d) Find the sids of suppliers who supply some red part or are at 221 packer Ave
e) Find the sids of suppliers who supply some red part and some green part

Q.4 Solve Any Two of the following. 12

A) What is normalization? Why one need to normalize the database tables? CO4/2 6

B) Explain 1st, 2nd and 3rd normal form with the help of suitable example. CO4/2 6

C) Why we need to organize database files? Mention the type of organisations, and explain any one with suitable example. CO3/2 6

Q. 5 Solve Any Two of the following. 12

A) Define Transaction and their properties with suitable example. CO5/2 6

B) Define serial and non-serial schedules. Explain serilisabilty with suitable example. CO5/2 6

C) Explain the need of concurrency control. Mention the concurrency control methods. Explain any one with suitable example. CO5/2 6

*** End ***

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary Summer Examination – 2024

Course: B. Tech. Branch : Computer Engineering/Computer Science and Engineering

Subject Code & Name: Database Systems (BTCOC501) Semester :V

Max Marks: 60 Date:01/07/2024 Duration: 3 Hr.

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	**Draw and explain the detailed system architecture of DBMS.**	**Understand**	**6**
B)	**Explain in detail about various key constraints used in database system.**	**Understand**	**6**
C)	**Discuss the main characteristics of the database approach and specify how it differs from traditional file system?**	**Analysis**	**6**
Q.2	**Solve Any Two of the following.**		**12**
A)	**Write a short notes on** **i) Foreign Key ii) Relation state iii) Database schema.**	**Understand**	**6**
B)	**account(account_number, branch_name, balance)** **branch (branch_name, branch_city, assets)** **customer (customer_name ,customer_street, customer_city)** **loan (loan_number, branch_name, amount)** **depositor((customer_name, account_number)** **borrower(customer_name, loan_number)** **Write the following queries in SQL:** **1)For all customers who have a loan from the bank, find their names, loan numbers, and loan amount.** **2) Find the customer names, loan numbers, and loan amounts, for all loans at the Panvel branch.** **3)Find the names of all branches that have assets greater than those of at least one branch located in Mumbai.** **4)Find the average account balance of those branches where the account balance is greater than Rs. 1500.** **5) Find the maximum across all branches of the total balance at each branch.**	**Apply**	**6**
C)	**Write the SQL syntax for the following with example:**	**Understand**	**6**

1)SELECT 2) ALTER 3)UPDATE

Q. 3	**Solve Any Two of the following.**		**12**
A)	**Write an SQL query for the following:** **a)To create a table of Hospital database with minimum 4 fields** **b) To insert two records** **c) To add new field** **d)To display all records**	**Apply**	**6**
B)	**What are JOINS? Explain INNER JOIN and OUTER JOIN.**	**Understand**	**6**
C)	**Explain different types of trigger.**	**Understand**	**6**
Q.4	**Solve Any Two of the following.**		**12**
A)	**State BCNF. How does it differ from 3NF?**	**Analysis**	**6**
B)	**Explain about dynamic multilevel indexing using B+ trees.**	**Understand**	**6**
C)	**Define Multi-valued dependency. Explain the Fourth normal form with an example.**	**Understand**	**6**
Q. 5	**Solve Any Two of the following.**		**12**
A)	**Explain in detail about timestamp based concurrency control techniques.**	**Understand**	**6**
B)	**Explain ACID properties of a transaction.**	**Understand**	**6**
C)	**Explain how Concurrency control can be achieved with locking methods?**	**Understand**	**6**

***** End *****