	Sahyadri College of Engineering & Management, Mangaluru Department of Computer Science & Engineering Assignment for Odd Semester 2022-23		
Course: Data Base Management System	Course Code: 18CS53	Sem: V	
Faculty: Dr. Pushpalatha K	Date: 26/12/2022	Deadline: 18/01/2023	
Question Paper No. 1	Max. Marks: 100		

Answer the following questions.

Q.No	Questions	Marks	Blooms Level	CO No.
1	Consider a MAIL_ORDER database in which employees take orders for parts from customers. The data requirements are summarized as follows: The mail order company has employees, each identified by a unique employee number, first and last name, and Zip Code. Each customer of the company is identified by a unique customer number, first and last name, and Zip Code. Each part sold by the company is identified by a unique part number, a part name, price, and quantity in stock. Each order placed by a customer is taken by an employee and is given a unique order number. Each order contains specified quantities of one or more parts. Each order has a date of receipt as well as an expected shipmate. The actual ship date is also recorded. Design an ER schema for the mail order database.	20	CL4	CO2
2	Map the above ER schema into relational schema	5	CL3	CO2
3	<p>Consider the following relations: Student(snum: integer, sname: string, major: string, level: string, age: integer) Class(cname: string, meets_at: time, room: string, fid: integer) Enrolled(snum: integer, cname: string) Faculty (fid: integer, fname: string, deptid: integer, salary) Write the following queries in SQL. No duplicates should be printed in any of the answers.</p> <ol style="list-style-type: none"> Find the names of all juniors (level = JR) who are enrolled in a class taught by a teacher. Find the age of the oldest student who is either a History major or enrolled in a course taught by a teacher. Find the names of all classes that either meet in room R128 or have five or more students enrolled. Find the names of all students who are enrolled in two classes that meet at the same time. Find the names of faculty members who teach in every room in which some class is taught. For all levels except JR, print the level and the average age of students for that level. For each faculty member that has taught classes only in room R128, print the faculty member's name and the total number of classes she or he has taught. Find the names of students enrolled in the maximum number of classes. Find the names of students not enrolled in any class. Return the faculty who earns the second highest salary. 	20	CL3	CO3
4	<p>Write the following queries in relational algebra</p> <ol style="list-style-type: none"> Find the fnames of faculties who teach in R128 Find the names of all Seniors (level = SR) who are enrolled in a class taught by a teacher Karan 	20	CL3	CO3

	3) Find the age of the oldest student who is either a History major or enrolled in a course taught by a teacher. 4) Retrieve the names of students who have not enrolled in any class. 5) Find the fids of faculties who are teach in maximum number of classes. 6) Find the fids of faculties who are teach in exactly three classes. 7) List the student names who enrol under only three faculties. 8) Find the names of all classes that either meet in room R128 or have five or more students enrolled. 9) Find the fids of faculties who are teach in all classes			
5	Convert following schemas to 3NF, showing all intermediate stages, i.e. 1NF and 2NF. MEMBERDINNER (<u>Membernum</u> , Membername, Memberaddr, <u>Dinnernum</u> , Dinnerdate, Venuecode, Venuedesc, {Foodcode, Fooddesc})	10	CL3	CO4
6	Consider a relation scheme $R=(A, B, C, D, E, H)$ on which the following functional dependencies hold: $\{A \rightarrow B, BC \rightarrow D, E \rightarrow C, D \rightarrow A\}$. What are the candidate keys of R? Consider the universal relation $R = \{A, B, C, D, E, F, G, H, I, J\}$ and the following dependencies: $A \rightarrow B$, $BC \rightarrow E$, and $ED \rightarrow A$. 1. List all keys for R. 2. Is R in 3NF? 3. Is R in BCNF?	15	CL3	CO4
7	1) Consider the transactions T1, T2, and T3 and the schedules S1 and S2 given below. $T1: r1(X); r1(Z); w1(X); w1(Z)$ $T2: r2(Y); r2(Z); w2(Z)$ $T3: r3(Y); r3(X); w3(Y)$ $S1: r1(X); r3(Y); r3(X); r2(Y); r2(Z); w3(Y); w2(Z); r1(Z); w1(X); w1(Z)$ $S2: r1(X); r3(Y); r2(Y); r3(X); r1(Z); r2(Z); w3(Y); w1(X); w2(Z); w1(Z)$ Which one of the following statements about the schedules is TRUE ? (A) Only S1 is conflict-serializable. (B) Only S2 is conflict-serializable. (C) Both S1 and S2 are conflict-serializable. (D) Neither S1 nor S2 is conflict-serializable. 2) Consider two transactions T ₁ and T ₂ and four schedules S ₁ , S ₂ , S ₃ , S ₄ of T ₁ and T ₂ as given below: $T_1: R_1[x] \ W_1[x] \ W_1[y]$ $T_2: R_2[x] \ R_2[y] \ W_2[y]$ $S_1: R_1[x] \ R_2[x] \ R_2[y] \ W_1[x] \ W_1[y] \ W_2[y]$ $S_2: R_1[x] \ R_2[x] \ R_2[y] \ W_1[x] \ W_2[y] \ W_1[y]$ $S_3: R_1[x] \ W_1[x] \ R_2[x] \ W_1[y] \ R_2[y] \ W_2[y]$ $S_4: R_2[x] \ R_2[y] \ R_1[x] \ W_1[x] \ W_1[y] \ W_2[y]$ Which of the above schedules are conflict-serializable?	10	CL3	CO5



Sahyadri College of Engineering & Management, Mangaluru
Department of Computer Science & Engineering
Assignment for Odd Semester 2022-23

Course: Data Base Management System	Course Code: 18CS53	Sem: V
Faculty: Dr. Pushpalatha K	Date: 26/12/2022	Deadline: 18/01/2023
Question Paper No. 2	Max. Marks: 100	

Answer the following questions.

Q.No	Questions	Marks	Blooms Level	CO No.
1	Consider a MOVIE database in which data is recorded about the movie industry. The data requirements are summarized as follows: Each movie is identified by title and year of release. Each movie has length in minutes. Each has a production company, and each is classified under one or more genres (such as horror, action, drama, and so forth). Each movie has one or more directors and one or more actors appear in it. Each movie also has a plot outline. Finally, each movie has zero or more quotable quotes, each of which is spoken by a particular actor appearing in the movie. Actors are identified by name and date of birth and appear in one or more movies. Each actor has a role in the movie. Directors are also identified by name and date of birth and direct one or more movies. It is possible for a director to act in a movie (including one that he or she may also direct). Production companies are identified by name and each has an address. A production company produces one or more movies. Design an ER schema for the movie database	20	CL4	CO2
2	Map the above ER schema into relational schema	5	CL3	CO2
3	Consider the following relations: Suppliers(sid: integer, sname: string, address: string) Parts(pid: integer, pname: string, color: string, mrp real) Catalog(sid: integer, pid: integer, cost: real) The Catalog lists the prices charged for parts by Suppliers. Write the following queries in SQL: 1) Find the pnames of parts for which there is some supplier. 2) Find the snames of suppliers who supply every part. 3) Find the snames of suppliers who supply every red part. 4) Find the pnames of parts supplied by Acme Suppliers and no one else. 5) Find the sids of suppliers who charge more for some part than the average cost of that part (averaged over all the suppliers who supply that part). 6) For each part, find the sname of the supplier who charges the most for that part. 7) Find the sids of suppliers who supply only red parts. 8) Find the sids of suppliers who supply a red part and a green part. 9) Find the sids of suppliers who supply a red part or a green part. 10) For every supplier that only supplies green parts, print the name of the supplier and the total number of parts that she supplies. 11) Return the product which has second highest mrp.	20	CL3	CO3
4	Write the following queries in relational algebra 1) Find the name of suppliers who supply some red part. 2) Find the sids of suppliers who supply some red or green part. 3) Find the sids of suppliers who supply some red part or are at 221 Packer Ave. 4) Find the sids of suppliers who supply some red part and some green part. 5) Find the sids of suppliers who supply every part.	20	CL3	CO3

	6) Find the sids of suppliers who supply every red part. 7) Find the sids of suppliers who supply every red or green part. 8) Find the sids of suppliers who supply every red part or supply every green part. 9) Find the pids of parts supplied by at least two different suppliers. 10) Find the pids of the most expensive parts supplied by suppliers named Yosemite Sham.			
5	Convert following schemas to 3NF, showing all intermediate stages, i.e. 1NF and 2NF. PATIENT (Patient#, Name, DOB, Address, (Prescription#, Drug, Date, Dosage, Doctor, Secretary))	10	CL3	CO4
6	Consider a relation scheme $R=(A, B, C, D, E, H)$ on which the following functional dependencies hold: $\{A \rightarrow B, BC \rightarrow D, E \rightarrow C, D \rightarrow A\}$. What are the candidate keys of R? Consider the universal relation $R = \{A, B, C, D, E, F, G, H, I, J\}$ and the following dependencies: $A \rightarrow B$, $BC \rightarrow E$, and $ED \rightarrow A$. 1) List all keys for R. 2) Is R in 3NF? 3) Is R in BCNF?	15	CL3	CO4
7	1) Consider the transactions T1, T2, and T3 and the schedules S1 and S2 given below. $T1: r1(X); r1(Z); w1(X); w1(Z)$ $T2: r2(Y); r2(Z); w2(Z)$ $T3: r3(Y); r3(X); w3(Y)$ $S1: r1(X); r3(Y); r3(X); r2(Y); r2(Z); w3(Y); w2(Z); r1(Z); w1(X); w1(Z)$ $S2: r1(X); r3(Y); r2(Y); r3(X); r1(Z); r2(Z); w3(Y); w1(X); w2(Z); w1(Z)$ Which one of the following statements about the schedules is TRUE ? (A) Only S1 is conflict-serializable. (B) Only S2 is conflict-serializable. (C) Both S1 and S2 are conflict-serializable. (D) Neither S1 nor S2 is conflict-serializable. 2) Consider two transactions T ₁ and T ₂ and four schedules S ₁ , S ₂ , S ₃ , S ₄ of T ₁ and T ₂ as given below: $T_1: R_1[x] \ W_1[x] \ W_1[y]$ $T_2: R_2[x] \ R_2[y] \ W_2[y]$ $S_1: R_1[x] \ R_2[x] \ R_2[y] \ W_1[x] \ W_1[y] \ W_2[y]$ $S_2: R_1[x] \ R_2[x] \ R_2[y] \ W_1[x] \ W_2[y] \ W_1[y]$ $S_3: R_1[x] \ W_1[x] \ R_2[x] \ W_1[y] \ R_2[y] \ W_2[y]$ $S_4: R_2[x] \ R_2[y] \ R_1[x] \ W_1[x] \ W_1[y] \ W_2[y]$ Which of the above schedules are conflict-serializable?	10	CL3	CO5



Sahyadri College of Engineering & Management, Mangaluru
Department of Computer Science & Engineering
Assignment for Odd Semester 2022-23

Course: Data Base Management System	Course Code: 18CS53	Sem: V
Faculty: Dr. Pushpalatha K	Date: 26/12/2022	Deadline: 18/01/2023
Question Paper No. 3	Max. Marks: 100	

Answer the following questions.

Q.No	Questions	Marks	Blooms Level	CO No.
1	Consider a CONFERENCE_REVIEW database in which researchers submit their research papers for consideration. Reviews by reviewers are recorded for use in the paper selection process. The database system caters primarily to reviewers who record answers to evaluation questions for each paper they review and make recommendations regarding whether to accept or reject the paper. The data requirements are summarized as follows: Authors of papers are uniquely identified by e-mail id. First and last names are also recorded. Each paper is assigned a unique identifier by the system and is described by a title, abstract, and the name of the electronic file containing the paper. A paper may have multiple authors, but one of the authors is designated as the contact author. Reviewers of papers are uniquely identified by e-mail address. Each reviewer's first name, last name, phone number, affiliation, and topics of interest are also recorded. Each paper is assigned between two and four reviewers. A reviewer rates each paper assigned to him or her on a scale of 1 to 10 in four categories: technical merit, readability, originality, and relevance to the conference. Finally, each reviewer provides an overall recommendation regarding each paper. Each review contains two types of written comments: one to be seen by the review committee only and the other as feedback to the author(s). Design an ER schema for the CONFERENCE_REVIEW database	20	CL4	CO2
2	Map the above ER schema into relational schema	5	CL3	CO2
3	<p>Consider the following relations containing airline flight information</p> <p>Flights(flno: integer, from: string, to: string, distance: integer, departs: time, arrives: time, price: real), Aircraft(aid: integer, aname: string, cruisingrange: integer) Certified(eid: integer, aid: integer), =(eid: integer, ename: string, salary: integer)</p> <p>Note that the Employees relation describes pilots and other kinds of employees as well; every pilot is certified for some aircraft, and only pilots are certified to fly.</p> <p>Write each of the following queries in SQL.</p> <ol style="list-style-type: none">Find the names of aircraft such that all pilots certified to operate them have salaries more than \$80,000.For each pilot who is certified for more than three aircraft, find the eid and the maximum cruising range of the aircraft for which she or he is certified.Find the names of pilots whose salary is less than the price of the cheapest route from Los Angeles to Honolulu.For all aircraft with cruising range over 1000 miles, find the name of the aircraft and the average salary of all pilots certified for this aircraft.Find the aids of all aircraft that can be used on routes from Los Angeles to Chicago.Print the enames of pilots who can operate planes with cruising range greater than 3000 miles but are not certified on any Boeing aircraft.Compute the difference between the average salary of a pilot and the average salary of all employees (including pilots).Print the name and salary of every nonpilot whose salary is more than the average salary for pilots.Print the names of employees who are certified only on aircrafts with cruising	20	CL3	CO3

	<p>range longer than 1000 miles, but on at least two such aircraft.</p> <p>10) Print the names of employees who are certified on all aircrafts</p> <p>11) List the flights that have second highest price.</p>			
4	<p>Write the following queries in relational algebra</p> <ol style="list-style-type: none"> Find the eids of pilots certified for some Boeing aircraft. Find the names of pilots certified for some Boeing aircraft. Find the aids of all aircraft that can be used on non-stop flights from Bonn to Madras. Identify the flights that can be piloted by every pilot whose salary is more than \$100,000. Find the names of pilots who can operate planes with a range greater than 3,000 miles but are not certified on any Boeing aircraft. Find the eids of employees who make the highest salary. Find the eids of employees who are certified for the largest number of aircraft. Find the eids of employees who are certified for exactly three aircraft. Find the total amount paid to employees as salaries. Find the names of employees who are certified on all aircrafts 	20	CL3	CO3
5	<p>Convert following schemas to 3NF, showing all intermediate stages, i.e. 1NF and 2NF. CLIENT (Client#, Name, Location, Manager#, Manager_name, Manager_location, (Contract#, Estimated_cost, Completion_date, (Staff#, Staff_name, Staff_location)))</p>	10	CL3	CO4
6	<p>Consider a relation scheme $R=(A, B, C, D, E, H)R=(A, B, C, D, E, H)$ on which the following functional dependencies hold: $\{A \rightarrow B, BC \rightarrow D, E \rightarrow C, D \rightarrow A\}$. $\{A \rightarrow B, BC \rightarrow D, E \rightarrow C, D \rightarrow A\}$. What are the candidate keys of R?</p> <p>Consider the universal relation $R = \{A, B, C, D, E, F, G, H, I, J\}$ and the Consider a relation R with five attributes ABCDE. You are given the following dependencies: $A \rightarrow B$, $BC \rightarrow E$, and $ED \rightarrow A$.</p> <ol style="list-style-type: none"> List all keys for R. Is R in 3NF? Is R in BCNF? 	15	CL3	CO4
7	<ol style="list-style-type: none"> Consider the transactions T1, T2, and T3 and the schedules S1 and S2 given below. $T1: r1(X); r1(Z); w1(X); w1(Z)$ $T2: r2(Y); r2(Z); w2(Z)$ $T3: r3(Y); r3(X); w3(Y)$ $S1: r1(X); r3(Y); r3(X); r2(Y); r2(Z); w3(Y); w2(Z); r1(Z); w1(X); w1(Z)$ $S2: r1(X); r3(Y); r2(Y); r3(X); r1(Z); r2(Z); w3(Y); w1(X); w2(Z); w1(Z)$ Which one of the following statements about the schedules is TRUE? (A) Only S1 is conflict-serializable. (B) Only S2 is conflict-serializable. (C) Both S1 and S2 are conflict-serializable. (D) Neither S1 nor S2 is conflict-serializable. Consider two transactions T₁ and T₂ and four schedules S₁, S₂, S₃, S₄ of T₁ and T₂ as given below: $T_1: R_1[x] \ W_1[x] \ W_1[y]$ $T_2: R_2[x] \ R_2[y] \ W_2[y]$ $S_1: R_1[x] \ R_2[x] \ R_2[y] \ W_1[x] \ W_1[y] \ W_2[y]$ $S_2: R_1[x] \ R_2[x] \ R_2[y] \ W_1[x] \ W_2[y] \ W_1[y]$ $S_3: R_1[x] \ W_1[x] \ R_2[x] \ W_1[y] \ R_2[y] \ W_2[y]$ $S_4: R_2[x] \ R_2[y] \ R_1[x] \ W_1[x] \ W_1[y] \ W_2[y]$ Which of the above schedules are conflict-serializable? 	10	CL3	CO5




Sahyadri College of Engineering & Management, Mangaluru
Department of Computer Science & Engineering
Assignment for Odd Semester 2022-23

Course: Data Base Management System	Course Code: 18CS53	Sem: V
Faculty: Dr. Pushpalatha K	Date: 26/12/2022	Deadline: 18/01/2023
Question Paper No. 4	Max. Marks: 100	

Answer the following questions.

Q. No	Questions	Marks	Blooms Level	CO No.
1	<p>Consider the following information about a university database: Professors have SSN, a name, an age, a rank, and a research specialty. Projects have a project number, a sponsor name (e.g., NSF), a starting date, an ending date, and a budget. Graduate students have an SSN, a name, an age, and a degree program (e.g., M.S. or Ph.D.). Each project is managed by one professor (known as the project's principal investigator). Each project is worked on by one or more professors (known as the project's co-investigators). Professors can manage and/or work on multiple projects. Each project is worked on by one or more graduate students (known as the project's research assistants). When graduate students on a project, a professor must supervise their work on the project. Graduate students can work on multiple projects, in which case they will have a (potentially different) supervisor for each one. Departments have a department number, a department name, and a main office. Departments have a professor (known as the chairman) who runs the department. Professors work in one or more departments, and for each department that they work in, a time percentage is associated with their job. Graduate students have one major department in which they are working on their degree. Each graduate student has another, more senior graduate student (known as a student advisor) who advises him or her on what courses to take. Design and draw an ER diagram that captures the information about the university.</p>	20	CL4	CO2
2	Map the above ER schema into relational schema	5	CL3	CO2
3	<p>Consider the following relational schema. An employee can work in more than one department; the pct_time field of the Works relation shows the percentage of time that a given employee works in a given department.</p> <p>Emp(eid: integer, ename: string, age: integer, salary: real) Works(eid: integer, did: integer, pct_time: integer)</p> <p>Dept(did: integer, dname: string, budget: real, managerid: integer) Write the following queries in SQL:</p> <ol style="list-style-type: none">1) Print the names and ages of each employee who works in both the Hardware department and the Software department.2) For each department with more than 20 full-time-equivalent employees (i.e., where the part-time and full-time employees add up to at least that many full-time employees), print the department id together with the number of employees that work in that department.3) Print the name of each employee whose salary exceeds the budget of all of the departments that he or she works in.4) Find the manager ids of managers who manage only departments with budgets greater than \$1 million.5) Find the enames of managers who manage the departments with the largest budgets.6) If a manager manages more than one department, he or she controls the sum of all the budgets for those departments. Find the manager ids of managers who control more than \$5 million.7) Find the manager ids of managers who control the largest amounts.	20	CL3	CO3

	<p>8) Find the enames of managers who manage only departments with budgets larger than \$1 million, but at least one department with budget less than \$5 million.</p> <p>9) Return the employee who earns the second highest salary.</p> <p>10) Find the employee who works for all department</p>			
4	<p>Write the following queries in relational algebra</p> <p>1) Print the names and ages of each employee who works in both the Hardware department and the Software department.</p> <p>2) Find the manager ids of managers who control the largest amounts.</p> <p>3) Find the eids and enames of employees who work for all department.</p> <p>4) Find the enames of employees who work for only Hardware department.</p> <p>5) Print the name of each employee who works in only for Hardware department and Software department.</p> <p>6) Find the enames of managers who manage the departments with the largest budgets.</p> <p>7) Print the name of each employee whose salary exceeds the budget of all of the departments that he or she works in.</p> <p>8) List the names of departments that have all the employees working for them.</p> <p>9) Find the employee who works for all department</p>	20	CL3	CO3
5	<p>Convert following schemas to 3NF, showing all intermediate stages, i.e. 1NF and 2NF. Enrollment (StudentID, courseID, course_Instructor, Student_Name, Student_Degree, Student_ADD, course_Name, Instructor_Name, Instructor_Office, Grade)</p>	10	CL3	CO4
6	<p>Consider a relation scheme $R=(A, B, C, D, E, H)$ on which the following functional dependencies hold: $\{A \rightarrow B, BC \rightarrow D, E \rightarrow C, D \rightarrow A\}$. What are the candidate keys of R?</p> <p>Consider the universal relation $R = \{A, B, C, D, E, F, G, H, I, J\}$ and the Consider a relation R with five attributes ABCDE. You are given the following dependencies: $A \rightarrow B$, $BC \rightarrow E$, and $ED \rightarrow A$.</p> <p>1) List all keys for R.</p> <p>2) Is R in 3NF?</p> <p>3) Is R in BCNF?</p>	15	CL3	CO4
7	<p>1) Consider the transactions T1, T2, and T3 and the schedules S1 and S2 given below.</p> <p>$T1: r1(X); r1(Z); w1(X); w1(Z)$</p> <p>$T2: r2(Y); r2(Z); w2(Z)$</p> <p>$T3: r3(Y); r3(X); w3(Y)$</p> <p>$S1: r1(X); r3(Y); r3(X); r2(Y); r2(Z); w3(Y); w2(Z); r1(Z); w1(X); w1(Z)$</p> <p>$S2: r1(X); r3(Y); r2(Y); r3(X); r1(Z); r2(Z); w3(Y); w1(X); w2(Z); w1(Z)$</p> <p>Which one of the following statements about the schedules is TRUE?</p> <p>(A) Only S1 is conflict-serializable.</p> <p>(B) Only S2 is conflict-serializable.</p> <p>(C) Both S1 and S2 are conflict-serializable.</p> <p>(D) Neither S1 nor S2 is conflict-serializable.</p> <p>2) Consider two transactions T₁ and T₂ and four schedules S₁, S₂, S₃, S₄ of T₁ and T₂ as given below:</p> <p>$T_1: R_1[x] W_1[x] W_1[y]$</p> <p>$T_2: R_2[x] R_2[y] W_2[y]$</p> <p>$S_1: R_1[x] R_2[x] R_2[y] W_1[x] W_1[y] W_2[y]$</p> <p>$S_2: R_1[x] R_2[x] R_2[y] W_1[x] W_2[y] W_1[y]$</p> <p>$S_3: R_1[x] W_1[x] R_2[x] W_1[y] R_2[y] W_2[y]$</p> <p>$S_4: R_2[x] R_2[y] R_1[x] W_1[x] W_1[y] W_2[y]$</p> <p>Which of the above schedules are conflict-serializable?</p>	10	CL3	CO5

	Sahyadri College of Engineering & Management, Mangaluru Department of Computer Science & Engineering Assignment for Odd Semester 2022-23		
Course: Data Base Management System		Course Code: 18CS53	Sem: V
Faculty: Dr. Pushpalatha K		Date: 26/12/2022	Deadline: 18/01/2023
Question Paper No. 5		Max. Marks: 100	

Answer the following questions.

Q. No	Questions	Marks	Blooms Level	CO No.
1	<p>Notown Records has decided to store information about musicians who perform on its albums (as well as other company data) in a database.</p> <p>Each musician that records at Notown has an SSN, a name, an address, and a phone number. Poorly paid musicians often share the same address, and no address has more than one phone.</p> <p>Each instrument used in songs recorded at Notown has a name (e.g., guitar, synthesizer, flute) and a musical key (e.g., C, B-flat, E-flat).</p> <p>Each album recorded on the Notown label has a title, a copyright date, a format (e.g., CD or MC), and an album identifier. Each song recorded at Notown has a title and an author. Each musician may play several instruments, and a given instrument may be played by several musicians. Each album has a number of songs on it, but no song may appear on more than one album. Each song is performed by one or more musicians, and a musician may perform a number of songs. Each album has exactly one musician who acts as its producer. A musician may produce several albums, of course.</p> <p>Draw an ER schema for Notown Records.</p>	20	CL4	CO2
2	Map the above ER schema into relational schema	5	CL3	CO2
3	<p>Consider the following relations:</p> <p>BOOK (Book_id, Title, Publisher_Name, Pub_Year) BOOK_AUTHORS (Book_id, Author_Name) PUBLISHER (Name, Address, Phone) BOOK_COPIES (Book_id, Branch_id, No-of Copies)</p> <p>BOOK_LENDING (Book_id, Branch_id, Card_No, Date_Out, Due_Date)</p> <p>LIBRARY_BRANCH (Branch_id, Branch_Name, Address) BORROWER (Card_no, Name, Address, Phone)</p> <p>Write the following queries in SQL:</p> <ol style="list-style-type: none"> 1) Display the number of books owned by each author. 2) Find the number of copies of the book titled The Lost Tribe which is owned by the library branch whose name is 'Sharpstown'? 3) Find the number of copies of the book titled The Lost Tribe which is owned by each library branch? 4) Retrieve the names of all borrowers who do not have any books checked out. 5) For each book that is loaned out from the Sharpstown branch and whose Due_date is today, retrieve the book title, the borrower's name, and the borrower's address. 6) For each library branch, retrieve the branch name and the total number of books loaned out from that branch. 7) Retrieve the names, addresses, and number of books checked out for all borrowers who have more than five books checked out. 8) For each book authored (or co-authored) by Stephen King, retrieve the title and the number of copies owned by the library branch whose name is Central. 9) Retrieve the books that have second highest number of copies 10) Display the books borrowed by all borrowers. 	20	CL3	CO3
4	<p>Write down relational algebra expressions for the following queries:</p> <ol style="list-style-type: none"> 1) Display the number of books owned by each author. 2) Display the books written by author Stephen King and published by 	20	CL3	CO3

	<p>Pearson publisher.</p> <p>3) How many copies of the book titled The Lost Tribe are owned by the library branch whose name is 'Sharpstown'?</p> <p>4) How many copies of the book titled The Lost Tribe are owned by each library branch?</p> <p>5) Retrieve the names of all borrowers who do not have any books checked out.</p> <p>6) For each book that is loaned out from the Sharpstown branch and whose Due_date is today, retrieve the book title, the borrower's name, and the borrower's address.</p> <p>7) For each library branch, retrieve the branch name and the total number of books loaned out from that branch.</p> <p>8) Retrieve the names, addresses, and number of books checked out for all borrowers who have more than five books checked out.</p> <p>9) For each book authored (or co-authored) by Stephen King, retrieve the title and the number of copies owned by the library branch whose name is Central.</p> <p>10) Display the books borrowed by all borrowers.</p>			
5	<p>Convert following schemas to 3NF, showing all intermediate stages, i.e. 1NF and 2NF.</p>	10	CL3	CO4
6	<p>Consider a relation scheme $R=(A, B,C,D,E,H)$ on which the following functional dependencies hold: $\{A \rightarrow B, BC \rightarrow D, E \rightarrow C, D \rightarrow A\}$. What are the candidate keys of R?</p> <p>Consider the universal relation $R = \{A, B, C, D, E, F, G, H, I, J\}$ and the relation R with five attributes ABCDE. You are given the following dependencies: $A \rightarrow B$, $BC \rightarrow E$, and $ED \rightarrow A$.</p> <ol style="list-style-type: none"> List all keys for R. Is R in 3NF? Is R in BCNF? 	15	CL3	CO4
7	<p>1) Consider the transactions T1, T2, and T3 and the schedules S1 and S2 given below.</p> <p>$T1: r1(X); r1(Z); w1(X); w1(Z)$</p> <p>$T2: r2(Y); r2(Z); w2(Z)$</p> <p>$T3: r3(Y); r3(X); w3(Y)$</p> <p>$S1: r1(X); r3(Y); r3(X); r2(Y); r2(Z); w3(Y); w2(Z); r1(Z); w1(X); w1(Z)$</p> <p>$S2: r1(X); r3(Y); r2(Y); r3(X); r1(Z); r2(Z); w3(Y); w1(X); w2(Z); w1(Z)$</p> <p>Which one of the following statements about the schedules is TRUE?</p> <p>(A) Only S1 is conflict-serializable.</p> <p>(B) Only S2 is conflict-serializable.</p> <p>(C) Both S1 and S2 are conflict-serializable.</p> <p>(D) Neither S1 nor S2 is conflict-serializable.</p> <p>2) Consider two transactions T1 and T2 and four schedules S1, S2, S3, S4 of T1 and T2 as given below:</p> <p>$T1: R_1[x] W_1[x] W_1[y]$</p> <p>$T2: R_2[x] R_2[y] W_2[y]$</p> <p>$S1: R_1[x] R_2[x] R_2[y] W_1[x] W_1[y] W_2[y]$</p> <p>$S2: R_1[x] R_2[x] R_2[y] W_1[x] W_2[y] W_1[y]$</p> <p>$S3: R_1[x] W_1[x] R_2[x] W_1[y] R_2[y] W_2[y]$</p> <p>$S4: R_2[x] R_2[y] R_1[x] W_1[x] W_1[y] W_2[y]$</p> <p>Which of the above schedules are conflict-serializable?</p>	10	CL3	CO5



Sahyadri College of Engineering & Management, Mangaluru
Department of Computer Science & Engineering
Assignment for Odd Semester 2022-23

Course: Data Base Management System	Course Code: 18CS53	Sem: V
Faculty: Dr. Pushpalatha K	Date: 26/12/2022	Deadline: 18/01/2023
Question Paper No. 6	Max. Marks: 100	

Answer the following questions.

Q. No	Questions	Marks	Blooms Level	CO No.
1	<p>Computer Sciences Department frequent fliers have been complaining to Mangalore Airport officials about the poor organization at the airport. As a result, the officials decided that all information related to the airport should be organized using a DBMS, and you have been hired to design the database. Your first task is to organize the information about all the airplanes stationed and maintained at the airport. The relevant information is as follows:</p> <p>Every airplane has a registration number, and each airplane is of a specific model. The airport accommodates a number of airplane models, and each model is identified by a model number (e.g., DC-10) and has a capacity and a weight. A number of technicians work at the airport. You need to store the name, SSN, address, phone number, and salary of each technician. Each technician is an expert on one or more plane model(s), and his or her expertise may overlap with that of other technicians. This information about technicians must also be recorded. Traffic controllers must have an annual medical examination. For each traffic controller, you must store the date of the most recent exam. All airport employees (including technicians) belong to a union. You must store the union membership number of each employee. You can assume that each employee is uniquely identified by a social security number. The airport has a number of tests that are used periodically to ensure that airplanes are still airworthy. Each test has a Federal Aviation Administration (FAA) test number, a name, and a maximum possible score. The FAA requires the airport to keep track of each time a given airplane is tested by a given technician using a given test. For each testing event, the information needed is the date, the number of hours the technician spent doing the test, and the score the airplane received on the test.</p> <p>Draw an ER schema for the airport database.</p>	20	CL4	CO2
2	Map the above ER schema into relational schema	5	CL3	CO2
3	<p>Consider the following relations</p> <p>PARTS(Pno, Pname, Qoh, Price, Olevel) CUSTOMERS(Cno, Cname, Street, Zip, Phone) EMPLOYEES(Eno, Ename, Zip, Hdate) ZIP_CODES(Zip, City)</p> <p>ORDERS(Ono, Cno, Eno, Received, Shipped) ODETAILS(Ono, Pno, Qty)</p> <p>Write the following queries in SQL:</p> <ol style="list-style-type: none">1) Retrieve the names of parts that cost less than \$20.00.2) Retrieve the names and cities of employees who have taken orders for parts costing more than \$50.00.3) Retrieve the pairs of customer number values of customers who live in the same ZIP Code.4) Retrieve the names of customers who have ordered parts from employees living in Mangalore.5) Retrieve the names of customers who have ordered parts costing less than \$20.00.6) Retrieve the names of customers who have not placed an order.7) Retrieve the names of customers who have placed exactly two orders.8) Retrieve the customer name who placed order for all the parts.	20	CL3	CO3

	9) Retrieve the employee name who prepared the order for all the parts that less than \$20.00. 10) Retrieve the parts that have second highest price										
4	Write down relational algebra expressions for the following queries: 1) Retrieve the names of parts that cost less than \$20.00. 2) Retrieve the names and cities of employees who have taken orders for parts costing more than \$50.00. 3) Retrieve the pairs of customer number values of customers who live in the same ZIP Code. 4) Retrieve the names of customers who have ordered parts from employees living in Mangalore. 5) Retrieve the names of customers who have ordered parts costing less than \$20.00. 6) Retrieve the names of customers who have not placed an order. 7) Retrieve the names of customers who have placed exactly two orders. 8) Retrieve the customer name who placed order for all the parts. 9) 9. Retrieve the customers and employees who live in same city	20	CL3	CO3							
5	Convert following schemas to 3NF, showing all intermediate stages, i.e. 1NF and 2NF. <table border="1"><tr><td>SID</td><td>CID</td><td>S_name</td><td>C_name</td><td>Grade</td><td>Faculty</td><td>F_phone</td></tr></table> {SID ,CID} -> Grade SID -> S_name CID -> C_name, Faculty Faculty ->F_phone	SID	CID	S_name	C_name	Grade	Faculty	F_phone	10	CL3	CO4
SID	CID	S_name	C_name	Grade	Faculty	F_phone					
6	Consider a relation scheme R=(A, B,C,D,E,H)R=(A,B,C,D,E,H) on which the following functional dependencies hold: {A→B,BC→D,E→C,D→A}. {A→B,BC→D,E→C,D→A}. What are the candidate keys of R? Consider the universal relation R = {A, B, C, D, E, F, G, H, I, J} and the Consider a relation R with five attributes ABCDE. You are given the following dependencies: A → B, BC → E, and ED → A. 1) List all keys for R. 2) Is R in 3NF? 3) Is R in BCNF?	15	CL3	CO4							
7	1) Consider the transactions T1, T2, and T3 and the schedules S1 and S2 given below. T1: r1(X); r1(Z); w1(X); w1(Z) T2: r2(Y); r2(Z); w2(Z) T3: r3(Y); r3(X); w3(Y) S1: r1(X); r3(Y); r3(X); r2(Y); r2(Z); w3(Y); w2(Z); r1(Z); w1(X); w1(Z) S2: r1(X); r3(Y); r2(Y); r3(X); r1(Z); r2(Z); w3(Y); w1(X); w2(Z); w1(Z) Which one of the following statements about the schedules is TRUE ? (A) Only S1 is conflict-serializable. (B) Only S2 is conflict-serializable. (C) Both S1 and S2 are conflict-serializable. (D) Neither S1 nor S2 is conflict-serializable. 2) Consider two transactions T1 and T2 and four schedules S1, S2, S3, S4 of T1 and T2 as given below: T1: R1[x] W1[x] W1[y] T2: R2[x] R2[y] W2[y] S1: R1[x] R2[x] R2[y] W1[x] W1[y] W2[y] S2: R1[x] R2[x] R2[y] W1[x] W2[y] W1[y] S3: R1[x] W1[x] R2[x] W1[y] R2[y] W2[y] S4: R2[x] R2[y] R1[x] W1[x] W1[y] W2[y] Which of the above schedules are conflict-serializable?	10	CL3	CO5							



Sahyadri College of Engineering & Management, Mangaluru
Department of Computer Science & Engineering
Assignment for Odd Semester 2022-23

Course: Data Base Management System	Course Code: 18CS53	Sem: V
Faculty: Dr. Pushpalatha K	Date: 26/12/2022	Deadline: 18/01/2023
Question Paper No. 7	Max. Marks: 100	

Answer the following questions.

Q. No	Questions	Marks	Blooms Level	CO No.
1	<p>The Prescriptions-R-X chain of pharmacies offered to give you a free life time supply of medicine if you design its database. Given the rising cost of health care, you agree. Here's the information that you gather:</p> <p>Patients are identified by an SSN, and their names, addresses, and ages must be recorded. Doctors are identified by an SSN. For each doctor, the name, specialty, and years of experience must be recorded. Each pharmaceutical company is identified by name and has a phone number. For each drug, the trade name and formula must be recorded. Each drug is sold by a given pharmaceutical company, and the trade name identifies drug uniquely from among the products of that company. If a pharmaceutical company is deleted, you need not keep track of its products any longer. Each pharmacy has a name, address, and phone number. Every patient has primary physician. Every doctor has at least one patient. Each pharmacy sells several drugs and has price for each. A drug could be sold at several pharmacies, and the price could vary from one pharmacy to another.</p> <p>Doctors prescribe drugs for patients. A doctor could prescribe one or more drugs for several patients, and a patient could obtain prescriptions from several doctors. Each prescription has a date and a quantity associated with it. You can assume that, if a doctor prescribes the same drug for the same patient more than once, only the last such prescription needs to be stored. Pharmaceutical companies have long-term contracts with pharmacies. A pharmaceutical company can contract with several pharmacies, and a pharmacy can contract with several pharmaceutical companies. For each contract, you have to store a start date, an end date, and the text of the contract. Pharmacies appoint a supervisor for each contract. There must always be a supervisor for each contract, but the contract supervisor can change over the lifetime of the contract.</p> <p>Draw an ER schema that captures the preceding information.</p>	20	CL4	CO2
2	Map the above ER schema into relational schema	5	CL3	CO2
3	<p>Consider the following relations: CUSTOMER(Cust#, Cname, City) ORDER(Order#, Odate, Cust#, Ord_amt) ORDER_ITEM(Order#, Item#, Qty) ITEM(Item#, Unit_price) SHIPMENT(Order#, Warehouse#, Ship_date) WAREHOUSE(Warehouse#, City)</p> <p>Write the following queries in SQL:</p> <ol style="list-style-type: none">List the WAREHOUSE information from which the CUSTOMER named Jose Lopez was supplied his orders. Produce a listing: Order#, Warehouse#.Produce a listing Cname, No_of_orders, Avg_order_amt, where the middle column is the total number of orders by the customer and the last column is the average order amount for that customer.List the orders that were not shipped within 30 days of ordering.List the Order# for orders that were shipped from all warehouses that the company has in New York.List the order nos that contain all the itemsList the orderno and total qty ordered by each order.List the customer name and total qty ordered by each customer	20	CL3	CO3

	10) List the customer's name who are not ordered a single order 11) Display the name and total quantity shipped from each warehouse. 12) List items that have third highest price			
4	<p>Write down relational algebra expressions for the following queries:</p> 1) List the Order# and Ship_date for all orders shipped from Warehouse# W2. 2) List the WAREHOUSE information from which the CUSTOMER named Jose Lopez was supplied his orders. Produce a listing: Order#, Warehouse#. 3) Produce a listing Cname, No_of_orders, Avg_order amt, where the middle column is the total number of orders by the customer and the last column is the average order amount for that customer. 4) List the orders that were not shipped within 30 days of ordering. 5) List the Order# for orders that were shipped from all warehouses that the company has in New York. 6) List the items shipped from 'Mangalore' warehouse. 7) List the total quantity shipped by each warehouse from New York city. 8) List the order nos that contain all the items 9) Display the customer name who placed order for maximum amount	20	CL3	CO3
5	<p>Convert following schemas to 3NF, showing all intermediate stages, i.e. 1NF and 2NF.</p>	10	CL3	CO4
6	<p>Consider a relation scheme $R=(A, B, C, D, E, H)$ on which the following functional dependencies hold: $\{A \rightarrow B, BC \rightarrow D, E \rightarrow C, D \rightarrow A\}$. What are the candidate keys of R?</p> <p>Consider the universal relation $R = \{A, B, C, D, E, F, G, H, I, J\}$ and the Consider a relation R with five attributes ABCDE. You are given the following dependencies: $A \rightarrow B$, $BC \rightarrow E$, and $ED \rightarrow A$.</p> <ol style="list-style-type: none"> List all keys for R. Is R in 3NF? Is R in BCNF? 	15	CL3	CO4
7	<ol style="list-style-type: none"> Consider the transactions T1, T2, and T3 and the schedules S1 and S2 given below. $T1: r1(X); r1(Z); w1(X); w1(Z)$ $T2: r2(Y); r2(Z); w2(Z)$ $T3: r3(Y); r3(X); w3(Y)$ $S1: r1(X); r3(Y); r3(X); r2(Y); r2(Z); w3(Y); w2(Z); r1(Z); w1(X); w1(Z)$ $S2: r1(X); r3(Y); r2(Y); r3(X); r1(Z); r2(Z); w3(Y); w1(X); w2(Z); w1(Z)$ Which one of the following statements about the schedules is TRUE? (A) Only S1 is conflict-serializable. (B) Only S2 is conflict-serializable. (C) Both S1 and S2 are conflict-serializable. (D) Neither S1 nor S2 is conflict-serializable. Consider two transactions T₁ and T₂ and four schedules S₁, S₂, S₃, S₄ of T₁ and T₂ as given below: $T_1: R_1[x] \ W_1[x] \ W_1[y]$ $T_2: R_2[x] \ R_2[y] \ W_2[y]$ $S_1: R_1[x] \ R_2[x] \ R_2[y] \ W_1[x] \ W_1[y] \ W_2[y]$ $S_2: R_1[x] \ R_2[x] \ R_2[y] \ W_1[x] \ W_2[y] \ W_1[y]$ $S_3: R_1[x] \ W_1[x] \ R_2[x] \ W_1[y] \ R_2[y] \ W_2[y]$ $S_4: R_2[x] \ R_2[y] \ R_1[x] \ W_1[x] \ W_1[y] \ W_2[y]$ Which of the above schedules are conflict-serializable? 	10	CL3	CO5




Sahyadri College of Engineering & Management, Mangaluru
Department of Computer Science & Engineering
Assignment for Odd Semester 2022-23

Course: Data Base Management System	Course Code: 18CS53	Sem: V
Faculty: Dr. Pushpalatha K	Date: 26/12/2022	Deadline: 18/01/2023
Question Paper No. 8	Max. Marks: 100	

Answer the following questions.

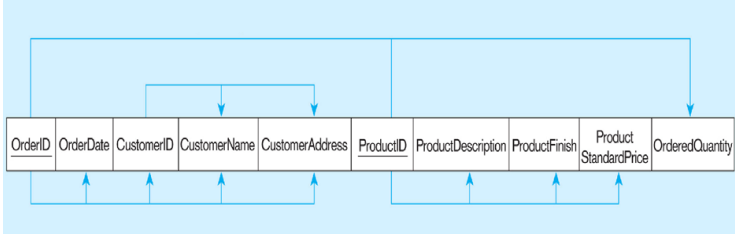
Q. No	Questions	Marks	Blooms Level	CO No.
1	<p>Scoundrel Airlines wants to keep information on its airplanes. They want to record the airports that they fly into and out of. Airport information should include the airport's code, the name of the airport, the primary city it serves, and in which state or province it is. The database should keep track of the types of airplanes that the Airline owns, capturing the information of the number of seats, the manufacturer, and the model name. The database should model the fact that only certain types of airplane can land at certain airports. For instance, jumbo jets can land at RIC, but not at the Newport News-Williamsburg International Airport (PHF). Every airplane is of a given airplane type. The database needs to keep track of flights. A leg of a trip is denoted by its departure information (from airport X, departure time) and its arrival information (to airport Y, arrival time). A particular airplane is assigned to a given flight leg on a given day. Each flight leg has a number of seats available to be reserved. Each seat on the airplane is reserved for a given customer, recording his or her name and telephone number. A flight is made up of a sequence of legs, for which they want to record the flight number, the flight fare, and whether the flight flies on weekdays or not.</p> <p>Design an E-R schema diagram to model Scoundrel Airline's database.</p>	20	CL4	CO2
2	Map the above ER schema into relational schema	5	CL3	CO2
3	<p>Consider a DB schema consisting of the following relation schemes:</p> <p>Person (name, age, gender) - Describes person</p> <p>Frequents (name, pizzeria) - Frequency of a person</p> <p>Eats (name, pizza) - What a person is eating</p> <p>Serves (pizzeria, pizza, price) - Information about serves</p> <p>Write the following queries in SQL:</p> <ol style="list-style-type: none">Find all pizzerias frequented by at least one person under the age of 18.Find the names of all females who eat either mushroom or pepperoni pizza (or both).Find the names of all females who eat all types of pizza.Find all pizzerias that serve at least one pizza that Amy eats for less than \$10.00.Find all pizzerias that are frequented by only females or only males.For each person, find all pizzas the person eats that are not served by any pizzeria the person frequents. Return all such person (name) / pizza pairs.Find the names of all people who frequent only pizzerias serving at least one pizza they eat.Find the names of all people who frequent every pizzeria serving at least one pizza they eat.Find the pizzeria serving the cheapest pepperoni pizza.Find the pizza that have second minimum price.	20	CL3	CO3
4	<p>Consider the following relations:</p> <p>Doctor(SSN, FirstName, LastName, Specialty, YearsOfExperience, PhoneNum)</p> <p>Patient(SSN, FirstName, LastName, Address, DOB, PrimaryDoctor_SSN)</p> <p>Medicine(TradeName, UnitPrice, GenericFlag)</p> <p>Prescription(Id, Date, Doctor_SSN, Patient_SSN)</p> <p>Prescription_Medicine(Prescription Id, TradeName, NumOfUnits)</p>	20	CL3	CO3

	<p>Write the relational algebra expressions for the following queries</p> <ol style="list-style-type: none"> 1) List the trade name of generic medicine with unit price less than \$50. 2) List the first and last name of patients whose primary doctor named 'John Smith'. 3) List the first and last name of doctors who are not primary doctors to any patient. 4) For medicines written in more than 20 prescriptions, report the trade name and the total number of units prescribed. 5) List the SSN of patients who have 'Aspirin' and 'Vitamin' trade names in one prescription. 6) List the SNN of distinct patients who have 'Aspirin' prescribed to them by doctor named 'John Smith' 7) List the first and last name of patients who have no prescriptions written by doctors other than their primary doctors. 8) List the first and last name of patients who gets treatment under minimum 3 doctors 9) Find the names of all patients who gets treatment under all doctors 10) Find the doctors who have highest patients 			
5	<p>Convert following schemas to 3NF, showing all intermediate stages, i.e. 1NF and 2NF.</p>	10	CL3	CO4
6	<p>Consider a relation scheme $R=(A, B,C,D,E,H)$ on which the following functional dependencies hold: $\{A \rightarrow B, BC \rightarrow D, E \rightarrow C, D \rightarrow A\}$. What are the candidate keys of R?</p> <p>Consider the universal relation $R = \{A, B, C, D, E, F, G, H, I, J\}$ and the Consider a relation R with five attributes ABCDE. You are given the following dependencies: $A \rightarrow B$, $BC \rightarrow E$, and $ED \rightarrow A$.</p> <ol style="list-style-type: none"> 1. List all keys for R. 2. Is R in 3NF? 3. Is R in BCNF? 	15	CL3	CO4
7	<p>1) Consider the transactions T1, T2, and T3 and the schedules S1 and S2 given below. $T1: r1(X); r1(Z); w1(X); w1(Z)$ $T2: r2(Y); r2(Z); w2(Z)$ $T3: r3(Y); r3(X); w3(Y)$ $S1: r1(X); r3(Y); r3(X); r2(Y); r2(Z); w3(Y); w2(Z); r1(Z); w1(X); w1(Z)$ $S2: r1(X); r3(Y); r2(Y); r3(X); r1(Z); r2(Z); w3(Y); w1(X); w2(Z); w1(Z)$ Which one of the following statements about the schedules is TRUE? (A) Only S1 is conflict-serializable. (B) Only S2 is conflict-serializable. (C) Both S1 and S2 are conflict-serializable. (D) Neither S1 nor S2 is conflict-serializable.</p> <p>2) Consider two transactions T₁ and T₂ and four schedules S₁, S₂, S₃, S₄ of T₁ and T₂ as given below: $T_1: R_1[x] \ W_1[x] \ W_1[y]$ $T_2: R_2[x] \ R_2[y] \ W_2[y]$ $S_1: R_1[x] \ R_2[x] \ R_2[y] \ W_1[x] \ W_1[y] \ W_2[y]$ $S_2: R_1[x] \ R_2[x] \ R_2[y] \ W_1[x] \ W_2[y] \ W_1[y]$ $S_3: R_1[x] \ W_1[x] \ R_2[x] \ W_1[y] \ R_2[y] \ W_2[y]$ $S_4: R_2[x] \ R_2[y] \ R_1[x] \ W_1[x] \ W_1[y] \ W_2[y]$ Which of the above schedules are conflict-serializable?</p>	10	CL3	CO5

	Sahyadri College of Engineering & Management, Mangaluru Department of Computer Science & Engineering Assignment for Odd Semester 2022-23		
Course: Data Base Management System		Course Code: 18CS53	Sem: V
Faculty: Dr. Pushpalatha K		Date: 26/12/2022	Deadline: 18/01/2023
Question Paper No. 9		Max. Marks: 100	

Answer the following questions.

Q.No	Questions	Marks	Blooms Level	CO No.
1	<p>Assume there is a library system with the following properties. The library contains one or several copies of the same book. Every copy of a book has a copy number and is located at a specific location in a shelf. A copy is identified by the copy number and the ISBN number of the book. Every book has a unique ISBN, a publication year, a title, an author, and a number of pages. Books are published by publishers. A publisher has a name as well as a location. Within the library system, books are assigned to one or several categories. A category can be a subcategory of exactly one other category. A category has a name and no further properties. Each reader needs to provide his/her family name, his/her first name, his/her city, and his/her date of birth to register at the library. Each reader gets a unique reader number. Readers borrow copies of books. Upon borrowing the return date is stored.</p> <p>(a) Create an ER diagram of this library system.</p>	20	CL4	CO2
2	Map the above ER schema into relational schema	5	CL3	CO2
3	<p>Consider the following relations:</p> <p>employee (<u>person-name</u>, street, city) works (<u>person-name</u>, <u>company-name</u>, salary) company (<u>company-name</u>, city) manages (<u>person-name</u>, <u>manager-name</u>)</p> <p>Write the following queries in SQL:</p> <ol style="list-style-type: none"> Find the names of all employees in this database who live in the same city as the company for which they work. Find the names of all employees who live in the same city and on the same street as do their managers. Find the names of all employees in this database who do not work for First Bank Corporation. Find the names of all employees who earn more than every employee of Small Bank Corporation. Find all companies located in every city in which Small Bank Corporation is located. Find the company with the second highest payroll. Find the company that has the most employees. Find the city that has all employees of First Bank Corporation Company. Find the manager who earns more than the average payroll of his company Find the cities that do not have managers from first bank corporation 	20	CL3	CO3
4	<p>Write the relational algebra expressions for the following queries</p> <ol style="list-style-type: none"> Find the names and cities of residence of all employees who work for First Bank Corporation. Find the names, street address, and cities of residence of all employees who work for First Bank Corporation and earn more than \$10,000 per annum. Find the names of all employees in this database who live in the same city as the company for which they work. Find the names of all employees who live in the same city and on the same street as do their managers. 	20	CL3	CO3

	<p>5) Find the names of all employees in this database who do not work for First Bank Corporation.</p> <p>6) Find the names of all employees who earn more than every employee of Small Bank Corporation.</p> <p>7) Find all companies located in every city in which Small Bank Corporation is located.</p> <p>8) Find the company with the smallest payroll.</p> <p>9) Find the company that has the most employees.</p> <p>10) Find the city that has all employees of First Bank Corporation Company.</p>			
5	<p>Convert following schemas to 3NF, showing all intermediate stages, i.e. 1NF and 2NF.</p> 	10	CL3	CO4
6	<p>Consider a relation scheme $R=(A, B,C,D,E,H)$ on which the following functional dependencies hold: $\{A \rightarrow B, BC \rightarrow D, E \rightarrow C, D \rightarrow A\}$. What are the candidate keys of R?</p> <p>Consider the universal relation $R = \{A, B, C, D, E, F, G, H, I, J\}$ and the following dependencies: $A \rightarrow B, BC \rightarrow E$, and $ED \rightarrow A$.</p> <ol style="list-style-type: none"> List all keys for R. Is R in 3NF? Is R in BCNF? 	15	CL3	CO4
7	<p>1) Consider the transactions T1, T2, and T3 and the schedules S1 and S2 given below.</p> <p>$T1: r1(X); r1(Z); w1(X); w1(Z)$</p> <p>$T2: r2(Y); r2(Z); w2(Z)$</p> <p>$T3: r3(Y); r3(X); w3(Y)$</p> <p>$S1: r1(X); r3(Y); r3(X); r2(Y); r2(Z); w3(Y); w2(Z); r1(Z); w1(X); w1(Z)$</p> <p>$S2: r1(X); r3(Y); r2(Y); r3(X); r1(Z); r2(Z); w3(Y); w1(X); w2(Z); w1(Z)$</p> <p>Which one of the following statements about the schedules is TRUE?</p> <p>(A) Only S1 is conflict-serializable.</p> <p>(B) Only S2 is conflict-serializable.</p> <p>(C) Both S1 and S2 are conflict-serializable.</p> <p>(D) Neither S1 nor S2 is conflict-serializable.</p> <p>2) Consider two transactions T_1 and T_2 and four schedules S_1, S_2, S_3, S_4 of T_1 and T_2 as given below:</p> <p>$T_1: R_1[x] \ W_1[x] \ W_1[y]$</p> <p>$T_2: R_2[x] \ R_2[y] \ W_2[y]$</p> <p>$S_1: R_1[x] \ R_2[x] \ R_2[y] \ W_1[x] \ W_1[y] \ W_2[y]$</p> <p>$S_2: R_1[x] \ R_2[x] \ R_2[y] \ W_1[x] \ W_2[y] \ W_1[y]$</p> <p>$S_3: R_1[x] \ W_1[x] \ R_2[x] \ W_1[y] \ R_2[y] \ W_2[y]$</p> <p>$S_4: R_2[x] \ R_2[y] \ R_1[x] \ W_1[x] \ W_1[y] \ W_2[y]$</p> <p>Which of the above schedules are conflict-serializable?</p>	10	CL3	CO5



Sahyadri College of Engineering & Management, Mangaluru
Department of Computer Science & Engineering
Assignment for Odd Semester 2022-23

Course: Data Base Management System	Course Code: 18CS53	Sem: V
Faculty: Dr. Pushpalatha K	Date: 26/12/2022	Deadline: 18/01/2023
Question Paper No. 10	Max. Marks: 100	

Answer the following questions.

Q. No	Questions	Marks	Blooms Level	CO No.
1	<p>Assume we have the following application that models soccer teams, the games they play, and the players in each team. In the design, we want to capture the following:</p> <ul style="list-style-type: none"> We have a set of teams, each team has an ID (unique identifier), name, main stadium, and to which city this team belongs. Each team has many players, and each player belongs to one team. Each player has a number (unique identifier), name, DoB, start year, and shirt number that he uses. Teams play matches, in each match there is a host team and a guest team. The match takes place in the stadium of the host team. For each match we need to keep track of the following: <ul style="list-style-type: none"> → The date on which the game is played → The final result of the match → The players participated in the match. For each player, how many goals he scored, whether or not he took yellow card, and whether or not he took red card. → During the match, one player may substitute another player. We want to capture this substitution and the time at which it took place. Each match has exactly three referees. For each referee we have an ID (unique identifier), name, DoB, years of experience. One referee is the main referee and the other two are assistant referee. <p>Design an ER diagram to capture the above requirements. State any assumptions you have that affects your design</p>	20	CL4	CO2
2	Map the above ER schema into relational schema	5	CL3	CO2
3	<p>Consider the following relations:</p> <p>Movie (title, year, length, inColor, studioName, producerC) MovieStar (name, address, gender, birthdate)</p> <p>StarsIn (movieTitle, movieYear, starName,salary) MovieExec (name, address, cert, netWorth) Studio (studioname, presc#);</p> <p>Write the following queries in SQL:</p> <ol style="list-style-type: none"> Find titles of all black and white movies which were produced after 1970 Find all the stars who either are male or live in Miami (have Miami as a part of their address). Find producer of 'Star wars' Find names of producers that produced at least one movie for each of different studios: Disney and MGM Find the movies that are longer than Gone with the Wind Find all the names of people that are either movie stars or movie executives Find the movie stars that have unique birthdates Query the titles that have been used for two or more movies Find the stars that were paid for some movie more than the average salary for that movie. Find the names of all stars which starred in at least 3 movies Find the names of the starts who acted in all movies of producers by Spielberg Find the names of stars who earns the second highest salary. 	20	CL3	CO3

4	<p>Consider the following collection of relation schemes: Professor(<u>ssn</u>, profname, status, salary) Course(<u>crscode</u>, crsname, credits) Taught(<u>crscode</u>, <u>semester</u>, ssn) Write the relational algebra expressions for the following queries</p> <ol style="list-style-type: none">1) Return those professors who have taught both 'csc6710' and 'csc7710'.2) Return those professors who have taught 'csc6710' but never 'csc7710'.3) Return those professors who taught 'CSC6710' and 'CSC7710' in the same semester4) Return those courses that have never been taught.5) Return those courses that have been taught at least in two semesters.6) Return the names of full professors who ever taught at least two courses in one semester.7) Return the names of the professors who have taught more than 30 credits of courses.8) Return the name(s) of the professor(s) who taught the most number of courses in S2006.9) List the names of those courses that Professor Smith has never taught.10) Return those courses that have been taught ONLY by assistant professors.11) 11. Return those courses that have been taught in all semesters.	20	CL3	CO3								
5	<p>Convert following schemas to 3NF, showing all intermediate stages, i.e. 1NF and 2NF.</p> <table><tr><td><u>VisitNo</u></td><td>VisitDate</td><td>PatNo</td><td>PatAge</td><td>PatCity</td><td><u>DocNo</u></td><td>DocSpecialty</td><td>Diagnosis</td></tr></table>	<u>VisitNo</u>	VisitDate	PatNo	PatAge	PatCity	<u>DocNo</u>	DocSpecialty	Diagnosis	10	CL3	CO4
<u>VisitNo</u>	VisitDate	PatNo	PatAge	PatCity	<u>DocNo</u>	DocSpecialty	Diagnosis					
6	<p>Consider a relation scheme $R=(A, B, C, D, E, H)$ on which the following functional dependencies hold: $\{A \rightarrow B, BC \rightarrow D, E \rightarrow C, D \rightarrow A\}$. What are the candidate keys of R?</p> <p>Consider the universal relation $R = \{A, B, C, D, E, F, G, H, I, J\}$ and the Consider a relation R with five attributes ABCDE. You are given the following dependencies: $A \rightarrow B$, $BC \rightarrow E$, and $ED \rightarrow A$.</p> <ol style="list-style-type: none">1. List all keys for R.2. Is R in 3NF?3. Is R in BCNF?	15	CL3	CO4								
7	<ol style="list-style-type: none">1) Consider the transactions T1, T2, and T3 and the schedules S1 and S2 given below. $T1: r1(X); r1(Z); w1(X); w1(Z)$ $T2: r2(Y); r2(Z); w2(Z)$ $T3: r3(Y); r3(X); w3(Y)$ $S1: r1(X); r3(Y); r3(X); r2(Y); r2(Z); w3(Y); w2(Z); r1(Z); w1(X); w1(Z)$ $S2: r1(X); r3(Y); r2(Y); r3(X); r1(Z); r2(Z); w3(Y); w1(X); w2(Z); w1(Z)$ Which one of the following statements about the schedules is TRUE? (A) Only S1 is conflict-serializable. (B) Only S2 is conflict-serializable. (C) Both S1 and S2 are conflict-serializable. (D) Neither S1 nor S2 is conflict-serializable.2) Consider two transactions T₁ and T₂ and four schedules S₁, S₂, S₃, S₄ of T₁ and T₂ as given below: $T_1: R_1[x] W_1[x] W_1[y]$ $T_2: R_2[x] R_2[y] W_2[y]$ $S_1: R_1[x] R_2[x] R_2[y] W_1[x] W_1[y] W_2[y]$ $S_2: R_1[x] R_2[x] R_2[y] W_1[x] W_2[y] W_1[y]$ $S_3: R_1[x] W_1[x] R_2[x] W_1[y] R_2[y] W_2[y]$ $S_4: R_2[x] R_2[y] R_1[x] W_1[x] W_1[y] W_2[y]$ Which of the above schedules are conflict-serializable?	10	CL3	CO5								



Sahyadri College of Engineering & Management, Mangaluru
Department of Computer Science & Engineering
Assignment for Odd Semester 2022-23

Course: Data Base Management System	Course Code: 18CS53	Sem: V
Faculty: Dr. Pushpalatha K	Date: 26/12/2022	Deadline: 18/01/2023
Question Paper No. 11	Max. Marks: 100	

Answer the following questions.

Q. No	Questions	Marks	Blooms Level	CO No.
1	<p>Scoundrel Airlines wants to keep information on its airplanes. They want to record the airports that they fly into and out of. Airport information should include the airport's code, the name of the airport, the primary city it serves, and in which state or province it is. The database should keep track of the types of airplanes that the Airline owns, capturing the information of the number of seats, the manufacturer, and the model name. The database should model the fact that only certain types of airplane can land at certain airports. For instance, jumbo jets can land at RIC, but not at the Newport News-Williamsburg International Airport (PHF). Every airplane is of a given airplane type. The database needs to keep track of flights. A leg of a trip is denoted by its departure information (from airport X, departure time) and its arrival information (to airport Y, arrival time). A particular airplane is assigned to a given flight leg on a given day. Each flight leg has a number of seats available to be reserved. Each seat on the airplane is reserved for a given customer, recording his or her name and telephone number. A flight is made up of a sequence of legs, for which they want to record the flight number, the flight fare, and whether the flight flies on weekdays or not.</p> <p>Design an E-R schema diagram to model Scoundrel Airline's database.</p>	20	CL4	CO2
2	Map the above ER schema into relational schema	5	CL3	CO2
3	<p>Consider the following relations:</p> <p>Movie (title, year, length, inColor, studioName, producerC) MovieStar (name, address, gender, birthdate)</p> <p>StarsIn (movieTitle, movieYear, starName,salary) MovieExec (name, address, cert, netWorth) Studio (studioname, presc#);</p> <p>Write the following queries in SQL:</p> <ol style="list-style-type: none">1) Find titles of all black and white movies which were produced before 19702) Find all the stars who either are male or live in Miami (have Miami as a part of their address).3) Find producer of 'X Men'4) Find names of producers that produced at least one movie for each of different studios: Disney and MGM5) Find the movies that are longer than 'Gone with the Wind'6) Find all the names of people that are either movie stars or movie executives7) Find the movie stars that have unique birthdates8) Query the titles that have been used for two or more movies9) Find the stars that were paid for some movie more than the average salary for that movie.10) Find the names of all stars which starred in at least 3 movies11) Find the names of the starts who acted in all movies of producers by Spielberg12) Find the names of stars who earns the second highest salary.	20	CL3	CO3
4	<p>Consider the following relations:</p> <p>Doctor(SSN, FirstName, LastName, Specialty, YearsOfExperience, PhoneNum)</p> <p>Patient(SSN, FirstName, LastName, Address, DOB, PrimaryDoctor_SSN)</p> <p>Medicine(TradeName, UnitPrice, GenericFlag)</p>	20	CL3	CO3

	<p>Prescription(Id, Date, Doctor_SSN, Patient_SSN)</p> <p>Prescription_Medicine(Prescription Id, TradeName, NumOfUnits)</p> <p>Write the relational algebra expressions for the following queries</p> <ol style="list-style-type: none"> 1) List the trade name of generic medicine with unit price less than \$50. 2) List the first and last name of patients whose primary doctor named 'John Smith'. 3) List the first and last name of doctors who are not primary doctors to any patient. 4) For medicines written in more than 20 prescriptions, report the trade name and the total number of units prescribed. 5) List the SSN of patients who have 'Aspirin' and 'Vitamin' trade names in one prescription. 6) List the SSN of distinct patients who have 'Aspirin' prescribed to them by doctor named 'John Smith' 7) List the first and last name of patients who have no prescriptions written by doctors other than their primary doctors. 8) List the first and last name of patients who gets treatment under minimum 3 doctors 9) Find the names of all patients who gets treatment under all doctors 10) Find the doctors who have highest patients 			
5	<p>Convert following schemas to 3NF, showing all intermediate stages, i.e. 1NF and 2NF.</p> <p>Convert following schemas to 3NF, showing all intermediate stages, i.e. 1NF and 2NF. MEMBERDINNER (<u>Membernum</u>, Membername, Memberaddr, <u>Dinnernum</u>, Dinnerdate, Venuecode, Venuedesc, {Foodcode, Fooddesc})</p>	10	CL3	CO4
6	<p>Consider a relation scheme $R=(A, B, C, D, E, H)$ on which the following functional dependencies hold: $\{A \rightarrow B, BC \rightarrow D, E \rightarrow C, D \rightarrow A\}$. What are the candidate keys of R?</p> <p>Consider the universal relation $R = \{A, B, C, D, E, F, G, H, I, J\}$ and the Consider a relation R with five attributes ABCDE. You are given the following dependencies: $A \rightarrow B$, $BC \rightarrow E$, and $ED \rightarrow A$.</p> <ol style="list-style-type: none"> 1) List all keys for R. 2) Is R in 3NF? 3) Is R in BCNF? 	15	CL3	CO4
7	<p>3) Consider the transactions T1, T2, and T3 and the schedules S1 and S2 given below.</p> <p>$T1: r1(X); r1(Z); w1(X); w1(Z)$</p> <p>$T2: r2(Y); r2(Z); w2(Z)$</p> <p>$T3: r3(Y); r3(X); w3(Y)$</p> <p>$S1: r1(X); r3(Y); r3(X); r2(Y); r2(Z); w3(Y); w2(Z); r1(Z); w1(X); w1(Z)$</p> <p>$S2: r1(X); r3(Y); r2(Y); r3(X); r1(Z); r2(Z); w3(Y); w1(X); w2(Z); w1(Z)$</p> <p>Which one of the following statements about the schedules is TRUE?</p> <ol style="list-style-type: none"> (A) Only S1 is conflict-serializable. (B) Only S2 is conflict-serializable. (C) Both S1 and S2 are conflict-serializable. (D) Neither S1 nor S2 is conflict-serializable. <p>4) Consider two transactions T₁ and T₂ and four schedules S₁, S₂, S₃, S₄ of T₁ and T₂ as given below:</p> <p>$T_1: R_1[x] \ W_1[x] \ W_1[y]$</p> <p>$T_2: R_2[x] \ R_2[y] \ W_2[y]$</p> <p>$S_1: R_1[x] \ R_2[x] \ R_2[y] \ W_1[x] \ W_1[y] \ W_2[y]$</p> <p>$S_2: R_1[x] \ R_2[x] \ R_2[y] \ W_1[x] \ W_2[y] \ W_1[y]$</p> <p>$S_3: R_1[x] \ W_1[x] \ R_2[x] \ W_1[y] \ R_2[y] \ W_2[y]$</p> <p>$S_4: R_2[x] \ R_2[y] \ R_1[x] \ W_1[x] \ W_1[y] \ W_2[y]$</p> <p>Which of the above schedules are conflict-serializable?</p>	10	CL3	CO5

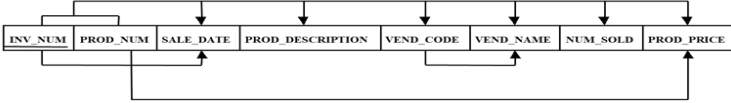


Sahyadri College of Engineering & Management, Mangaluru
Department of Computer Science & Engineering
Assignment for Odd Semester 2022-23

Course: Data Base Management System	Course Code: 18CS53	Sem: V
Faculty: Dr. Pushpalatha K	Date: 26/12/2022	Deadline: 18/01/2023
Question Paper No. 12	Max. Marks: 100	

Answer the following questions.

Q. No	Questions	Marks	Blooms Level	CO No.
1	Consider a MAIL_ORDER database in which employees take orders for parts from customers. The data requirements are summarized as follows: The mail order company has employees, each identified by a unique employee number, first and last name, and Zip Code. Each customer of the company is identified by a unique customer number, first and last name, and Zip Code. Each part sold by the company is identified by a unique part number, a part name, price, and quantity in stock. Each order placed by a customer is taken by an employee and is given a unique order number. Each order contains specified quantities of one or more parts. Each order has a date of receipt as well as an expected shipmate. The actual ship date is also recorded. Design an ER schema for the mail order database.	20	CL4	CO2
2	Map the above ER schema into relational schema	5	CL3	CO2
3	Consider the following relations containing airline flight information Flights (flno: integer, from: string, to: string, distance: integer, departs: time, arrives: time, price: real) , Aircraft (aid: integer, aname: string, cruisingrange: integer) Certified (eid: integer, aid: integer) , =(eid: integer, ename: string, salary: integer) Note that the Employees relation describes pilots and other kinds of employees as well; every pilot is certified for some aircraft, and only pilots are certified to fly. Write each of the following queries in SQL. 1) Find the names of aircraft such that all pilots certified to operate them have salaries more than \$80,000. 2) For each pilot who is certified for more than three aircraft, find the eid and the maximum cruising range of the aircraft for which she or he is certified. 3) Find the names of pilots whose salary is less than the price of the cheapest route from Los Angeles to Honolulu. 4) For all aircraft with cruising range over 1000 miles, find the name of the aircraft and the average salary of all pilots certified for this aircraft. 5) Find the aids of all aircraft that can be used on routes from Los Angeles to Chicago. 6) Print the enames of pilots who can operate planes with cruising range greater than 3000 miles but are not certified on any Boeing aircraft. 7) Compute the difference between the average salary of a pilot and the average salary of all employees (including pilots). 8) Print the name and salary of every nonpilot whose salary is more than the average salary for pilots. 9) Print the names of employees who are certified only on aircrafts with cruising range longer than 1000 miles, but on at least two such aircrafts. 10) Print the names of employees who are certified on all aircrafts 11) List the flights that have second highest price.	20	CL3	CO3
4	Consider the following relations: Student (snum: integer, sname: string, major: string, level: string, age: integer) Class (cname: string, meets_at: time, room: string, fid: integer) Enrolled (snum: integer, cname: string)	20	CL3	CO3

	<p>Faculty (fid: integer, fname: string, deptid: integer, salary)</p> <p>Write the following queries in relational algebra</p> <p>10) Find the fnames of faculties who teach in R128</p> <p>11) Find the names of all Seniors (level = SR) who are enrolled in a class taught by a teacher Karan</p> <p>12) Find the age of the oldest student who is either a History major or enrolled in a course taught by a teacher.</p> <p>13) Retrieve the names of students who have not enrolled in any class.</p> <p>14) Find the fids of faculties who are teach in maximum number of classes.</p> <p>15) Find the fids of faculties who are teach in exactly three classes.</p> <p>16) List the student names who enrol under only three faculties.</p> <p>17) Find the names of all classes that either meet in room R128 or have five or more students enrolled.</p> <p>18) Find the fids of faculties who are teach in all classes</p>			
5	<p>Convert following schemas to 3NF, showing all intermediate stages, i.e. 1NF and 2NF.</p> 	10	CL3	CO4
6	<p>Consider a relation scheme $R = (A, B, C, D, E, H)$ on which the following functional dependencies hold: $\{A \rightarrow B, BC \rightarrow D, E \rightarrow C, D \rightarrow A\}$. What are the candidate keys of R?</p> <p>Consider the universal relation $R = \{A, B, C, D, E, F, G, H, I, J\}$ and the Consider a relation R with five attributes ABCDE. You are given the following dependencies: $A \rightarrow B$, $BC \rightarrow E$, and $ED \rightarrow A$.</p> <p>1) List all keys for R.</p> <p>2) Is R in 3NF?</p> <p>3) Is R in BCNF?</p>	15	CL3	CO4
7	<p>3) Consider the transactions T1, T2, and T3 and the schedules S1 and S2 given below.</p> <p>$T1: r1(X); r1(Z); w1(X); w1(Z)$</p> <p>$T2: r2(Y); r2(Z); w2(Z)$</p> <p>$T3: r3(Y); r3(X); w3(Y)$</p> <p>$S1: r1(X); r3(Y); r3(X); r2(Y); r2(Z); w3(Y); w2(Z); r1(Z); w1(X); w1(Z)$</p> <p>$S2: r1(X); r3(Y); r2(Y); r3(X); r1(Z); r2(Z); w3(Y); w1(X); w2(Z); w1(Z)$</p> <p>Which one of the following statements about the schedules is TRUE?</p> <p>(A) Only S1 is conflict-serializable.</p> <p>(B) Only S2 is conflict-serializable.</p> <p>(C) Both S1 and S2 are conflict-serializable.</p> <p>(D) Neither S1 nor S2 is conflict-serializable.</p> <p>4) Consider two transactions T1 and T2 and four schedules S1, S2, S3, S4 of T1 and T2 as given below:</p> <p>$T1: R1[x] W1[x] W1[y]$</p> <p>$T2: R2[y] R2[y] W2[y]$</p> <p>$S1: R1[x] R2[x] R2[y] W1[x] W1[y] W2[y]$</p> <p>$S2: R1[x] R2[x] R2[y] W1[x] W2[y] W1[y]$</p> <p>$S3: R1[x] W1[x] R2[x] W1[y] R2[y] W2[y]$</p> <p>$S4: R2[x] R2[y] R1[x] W1[x] W1[y] W2[y]$</p> <p>Which of the above schedules are conflict-serializable?</p>	10	CL3	CO5



Sahyadri College of Engineering & Management, Mangaluru
Department of Computer Science & Engineering
Assignment for Odd Semester 2022-23

Course: Data Base Management System	Course Code: 18CS53	Sem: V
Faculty: Dr. Pushpalatha K	Date: 26/12/2022	Deadline: 18/01/2023
Question Paper No. 13	Max. Marks: 100	

Answer the following questions.

Q. No	Questions	Marks	Blooms Level	CO No.
1	<p>The Prescriptions-R-X chain of pharmacies offered to give you a free life time supply of medicine if you design its database. Given the rising cost of health care, you agree. Here's the information that you gather:</p> <p>Patients are identified by an SSN, and their names, addresses, and ages must be recorded. Doctors are identified by an SSN. For each doctor, the name, specialty, and years of experience must be recorded. Each pharmaceutical company is identified by name and has a phone number. For each drug, the trade name and formula must be recorded. Each drug is sold by a given pharmaceutical company, and the trade name identifies drug uniquely from among the products of that company. If a pharmaceutical company is deleted, you need not keep track of its products any longer. Each pharmacy has a name, address, and phone number. Every patient has primary physician. Every doctor has at least one patient. Each pharmacy sells several drugs and has price for each. A drug could be sold at several pharmacies, and the price could vary from one pharmacy to another.</p> <p>Doctors prescribe drugs for patients. A doctor could prescribe one or more drugs for several patients, and a patient could obtain prescriptions from several doctors. Each prescription has a date and a quantity associated with it. You can assume that, if a doctor prescribes the same drug for the same patient more than once, only the last such prescription needs to be stored. Pharmaceutical companies have long-term contracts with pharmacies. A pharmaceutical company can contract with several pharmacies, and a pharmacy can contract with several pharmaceutical companies. For each contract, you have to store a start date, an end date, and the text of the contract. Pharmacies appoint a supervisor for each contract. There must always be a supervisor for each contract, but the contract supervisor can change over the lifetime of the contract.</p> <p>Draw an ER schema that captures the preceding information.</p>	20	CL4	CO2
2	Map the above ER schema into relational schema	5	CL3	CO2
3	<p>Consider the following relations:</p> <p>Student(snum: integer, sname: string, major: string, level: string, age: integer) Class(cname: string, meets_at: time, room: string, fid: integer) Enrolled(snum: integer, cname: string) Faculty (fid: integer, fname: string, deptid: integer, salary)</p> <p>Write the following queries in SQL.</p> <ol style="list-style-type: none">Find the names of all juniors (level = JR) who are enrolled in a class taught by a teacher.Find the age of the oldest student who is either a History major or enrolled in a course taught by a teacher.Find the names of all classes that either meet in room R128 or have five or more students enrolled.Find the names of all students who are enrolled in two classes that meet at the same time.Find the names of faculty members who teach in every room in which some class is taught.For all levels except JR, print the level and the average age of students for that level.For each faculty member that has taught classes only in room R128, print the faculty	20	CL3	CO3

	<p>member's name and the total number of classes she or he has taught.</p> <p>8) Find the names of students enrolled in the maximum number of classes.</p> <p>9) Find the names of students not enrolled in any class.</p> <p>10) Return the faculty who earns the second highest salary.</p>			
4	<p>Consider the following relations: CUSTOMER(Cust#, Cname, City) ORDER(Order#, Odate, Cust#, Ord_amt) ORDER_ITEM(Order#, Item#, Qty) ITEM(Item#, Unit_price) SHIPMENT(Order#, Warehouse#, Ship_date) WAREHOUSE(Warehouse#, City)</p> <p>Write down relational algebra expressions for the following queries:</p> <p>1) List the Order# and Ship_date for all orders shipped from Warehouse# W2.</p> <p>2) List the WAREHOUSE information from which the CUSTOMER named Jose Lopez was supplied his orders. Produce a listing: Order#, Warehouse#.</p> <p>3) Produce a listing Cname, No_of_orders, Avg_order_amt, where the middle column is the total number of orders by the customer and the last column is the average order amount for that customer.</p> <p>4) List the orders that were not shipped within 30 days of ordering.</p> <p>5) List the Order# for orders that were shipped from all warehouses that the company has in New York.</p> <p>6) List the items shipped from 'Mangalore' warehouse.</p> <p>7) List the total quantity shipped by each warehouse from New York city.</p> <p>8) List the order nos that contain all the items</p> <p>9) Display the customer name who placed order for maximum amount</p>	20	CL3	CO3
5	<p>Convert following schemas to 3NF, showing all intermediate stages, i.e. 1NF and 2NF.</p> <p>Enrollment (<u>StudentID</u>, <u>courseID</u>, course_Instructor, Student_Name, Student_Degree, Student_ADD, course_Name, Instructor_Name, Instructor_Office, Grade)</p>	10	CL3	CO4
6	<p>Consider a relation scheme $R=(A, B, C, D, E, H)$ on which the following functional dependencies hold: $\{A \rightarrow B, BC \rightarrow D, E \rightarrow C, D \rightarrow A\}$. What are the candidate keys of R?</p> <p>Consider the universal relation $R = \{A, B, C, D, E, F, G, H, I, J\}$ and the Consider a relation R with five attributes ABCDE. You are given the following dependencies: $A \rightarrow B$, $BC \rightarrow E$, and $ED \rightarrow A$.</p> <p>1) List all keys for R.</p> <p>2) Is R in 3NF?</p> <p>3) Is R in BCNF?</p>	15	CL3	CO4
7	<p>3) Consider the transactions T1, T2, and T3 and the schedules S1 and S2 given below.</p> <p>$T1: r1(X); r1(Z); w1(X); w1(Z)$</p> <p>$T2: r2(Y); r2(Z); w2(Z)$</p> <p>$T3: r3(Y); r3(X); w3(Y)$</p> <p>$S1: r1(X); r3(Y); r3(X); r2(Y); r2(Z); w3(Y); w2(Z); r1(Z); w1(X); w1(Z)$</p> <p>$S2: r1(X); r3(Y); r2(Y); r3(X); r1(Z); r2(Z); w3(Y); w1(X); w2(Z); w1(Z)$</p> <p>Which one of the following statements about the schedules is TRUE?</p> <p>(A) Only S1 is conflict-serializable.</p> <p>(B) Only S2 is conflict-serializable.</p> <p>(C) Both S1 and S2 are conflict-serializable.</p> <p>(D) Neither S1 nor S2 is conflict-serializable.</p> <p>4) Consider two transactions T₁ and T₂ and four schedules S₁, S₂, S₃, S₄ of T₁ and T₂ as given below:</p> <p>$T_1: R_1[x] \ W_1[x] \ W_1[y]$</p> <p>$T_2: R_2[x] \ R_2[y] \ W_2[y]$</p> <p>$S_1: R_1[x] \ R_2[x] \ R_2[y] \ W_1[x] \ W_1[y] \ W_2[y]$</p> <p>$S_2: R_1[x] \ R_2[x] \ R_2[y] \ W_1[x] \ W_2[y] \ W_1[y]$</p> <p>$S_3: R_1[x] \ W_1[x] \ R_2[x] \ W_1[y] \ R_2[y] \ W_2[y]$</p> <p>$S_4: R_2[x] \ R_2[y] \ R_1[x] \ W_1[x] \ W_1[y] \ W_2[y]$</p> <p>Which of the above schedules are conflict-serializable?</p>	10	CL3	CO5



Sahyadri College of Engineering & Management, Mangaluru
Department of Computer Science & Engineering
Assignment for Odd Semester 2022-23

Course: Data Base Management System	Course Code: 18CS53	Sem: V
Faculty: Dr. Pushpalatha K	Date: 26/12/2022	Deadline: 18/01/2023
Question Paper No. 14	Max. Marks: 100	

Answer the following questions.

Q. No	Questions	Marks	Blooms Level	CO No.
1	<p>Scoundrel Airlines wants to keep information on its airplanes. They want to record the airports that they fly into and out of. Airport information should include the airport's code, the name of the airport, the primary city it serves, and in which state or province it is. The database should keep track of the types of airplanes that the Airline owns, capturing the information of the number of seats, the manufacturer, and the model name. The database should model the fact that only certain types of airplane can land at certain airports. For instance, jumbo jets can land at RIC, but not at the Newport News-Williamsburg International Airport (PHF). Every airplane is of a given airplane type. The database needs to keep track of flights. A leg of a trip is denoted by its departure information (from airport X, departure time) and its arrival information (to airport Y, arrival time). A particular airplane is assigned to a given flight leg on a given day. Each flight leg has a number of seats available to be reserved. Each seat on the airplane is reserved for a given customer, recording his or her name and telephone number. A flight is made up of a sequence of legs, for which they want to record the flight number, the flight fare, and whether the flight flies on weekdays or not.</p> <p>Design an E-R schema diagram to model Scoundrel Airline's database.</p>	20	CL4	CO2
2	Map the above ER schema into relational schema	5	CL3	CO2
3	<p>Consider the following relations:</p> <p>BOOK (Book_id, Title, Publisher_Name, Pub_Year) BOOK_AUTHORS (Book_id, Author_Name) PUBLISHER (Name, Address, Phone) BOOK_COPIES (Book_id, Branch_id, No-of_Copies) BOOK_LENDING (Book_id, Branch_id, Card_No, Date_Out, Due_Date) LIBRARY_BRANCH (Branch_id, Branch_Name, Address) BORROWER (Card_no, Name, Address, Phone)</p> <p>Write the following queries in SQL:</p> <ol style="list-style-type: none">1) Display the number of books owned by each author.2) Find the number of copies of the book titled The Lost Tribe which is owned by the library branch whose name is 'Sharpstown'?3) Find the number of copies of the book titled The Lost Tribe which is owned by each library branch?4) Retrieve the names of all borrowers who do not have any books checked out.5) For each book that is loaned out from the Sharpstown branch and whose Due_date is today, retrieve the book title, the borrower's name, and the borrower's address.6) For each library branch, retrieve the branch name and the total number of books loaned out from that branch.7) Retrieve the names, addresses, and number of books checked out for all borrowers who have more than five books checked out.8) For each book authored (or co-authored) by Stephen King, retrieve the title and the number of copies owned by the library branch whose name is Central.9) Retrieve the books that have second highest number of copies10) Display the books borrowed by all borrowers.	20	CL3	CO3

4	<p>Consider the following relations: Doctor(SSN, FirstName, LastName, Specialty, YearsOfExperience, PhoneNum) Patient(SSN, FirstName, LastName, Address, DOB, PrimaryDoctor_SSN) Medicine(TradeName, UnitPrice, GenericFlag) Prescription(Id, Date, Doctor_SSN, Patient_SSN) Prescription_Medicine(Prescription Id, TradeName, NumOfUnits)</p> <p>Write the relational algebra expressions for the following queries</p> <ol style="list-style-type: none"> 1) List the trade name of generic medicine with unit price less than \$50. 2) List the first and last name of doctors who are not primary doctors to any patient. 3) For medicines written in more than 20 prescriptions, report the trade name and the total number of units prescribed. 4) List the SSN of patients who have 'Aspirin' and 'Vitamin' trade names in one prescription. 5) List the SSN of distinct patients who have 'Aspirin' prescribed to them by doctor named 'John Smith' 6) List the first and last name of patients who have no prescriptions written by doctors other than their primary doctors. 7) List the first and last name of patients who gets treatment under minimum 3 doctors 8) Find the names of all patients who gets treatment under all doctors 9) Find the doctors who have highest patients 	20	CL3	CO3
5	<p>Convert following schemas to 3NF, showing all intermediate stages, i.e. 1NF and 2NF.</p>	10	CL3	CO4
6	<p>Consider a relation scheme $R=(A, B,C,D,E,H)$ on which the following functional dependencies hold: $\{A \rightarrow B, BC \rightarrow D, E \rightarrow C, D \rightarrow A\}$. What are the candidate keys of R?</p> <p>Consider the universal relation $R = \{A, B, C, D, E, F, G, H, I, J\}$ and the Consider a relation R with five attributes ABCDE. You are given the following dependencies: $A \rightarrow B$, $BC \rightarrow E$, and $ED \rightarrow A$.</p> <ol style="list-style-type: none"> 1) List all keys for R. 2) Is R in 3NF? 3) Is R in BCNF? 	15	CL3	CO4
7	<ol style="list-style-type: none"> 1) Consider the transactions T1, T2, and T3 and the schedules S1 and S2 given below. $T1: r1(X); r1(Z); w1(X); w1(Z)$ $T2: r2(Y); r2(Z); w2(Z)$ $T3: r3(Y); r3(X); w3(Y)$ $S1: r1(X); r3(Y); r3(X); r2(Y); r2(Z); w3(Y); w2(Z); r1(Z); w1(X); w1(Z)$ $S2: r1(X); r3(Y); r2(Y); r3(X); r1(Z); r2(Z); w3(Y); w1(X); w2(Z); w1(Z)$ Which one of the following statements about the schedules is TRUE? (A) Only S1 is conflict-serializable. (B) Only S2 is conflict-serializable. (C) Both S1 and S2 are conflict-serializable. (D) Neither S1 nor S2 is conflict-serializable. 2) Consider two transactions T₁ and T₂ and four schedules S₁, S₂, S₃, S₄ of T₁ and T₂ as given below: $T_1: R_1[x] \ W_1[x] \ W_1[y]$ $T_2: R_2[x] \ R_2[y] \ W_2[y]$ $S_1: R_1[x] \ R_2[x] \ R_2[y] \ W_1[x] \ W_1[y] \ W_2[y]$ $S_2: R_1[x] \ R_2[x] \ R_2[y] \ W_1[x] \ W_2[y] \ W_1[y]$ $S_3: R_1[x] \ W_1[x] \ R_2[x] \ W_1[y] \ R_2[y] \ W_2[y]$ $S_4: R_2[x] \ R_2[y] \ R_1[x] \ W_1[x] \ W_1[y] \ W_2[y]$ Which of the above schedules are conflict-serializable? 	10	CL3	CO5

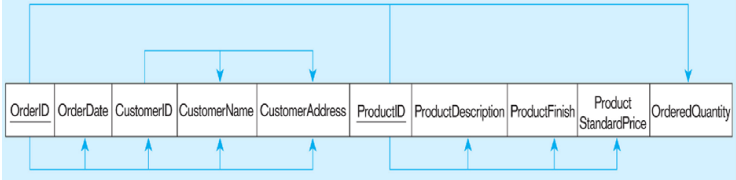


Sahyadri College of Engineering & Management, Mangaluru
Department of Computer Science & Engineering
Assignment for Odd Semester 2022-23

Course: Data Base Management System	Course Code: 18CS53	Sem: V
Faculty: Dr. Pushpalatha K	Date: 26/12/2022	Deadline: 18/01/2023
Question Paper No. 15	Max. Marks: 100	

Answer the following questions.

Q. No	Questions	Marks	Blooms Level	CO No.
1	<p>Assume there is a library system with the following properties. The library contains one or several copies of the same book. Every copy of a book has a copy number and is located at a specific location in a shelf. A copy is identified by the copy number and the ISBN number of the book. Every book has a unique ISBN, a publication year, a title, an author, and a number of pages. Books are published by publishers. A publisher has a name as well as a location. Within the library system, books are assigned to one or several categories. A category can be a subcategory of exactly one other category. A category has a name and no further properties. Each reader needs to provide his/her family name, his/her first name, his/her city, and his/her date of birth to register at the library. Each reader gets a unique reader number. Readers borrow copies of books. Upon borrowing the return date is stored.</p> <p>(a) Create an ER diagram of this library system.</p>	20	CL4	CO2
2	Map the above ER schema into relational schema	5	CL3	CO2
3	<p>Consider the following relations containing airline flight information Flights(fno: integer, from: string, to: string, distance: integer, departs: time, arrives: time, price: real) , Aircraft(aid: integer, aname: string, cruisingrange: integer) Certified(eid: integer, aid: integer) , =(eid: integer, ename: string, salary: integer) Note that the Employees relation describes pilots and other kinds of employees as well; every pilot is certified for some aircraft, and only pilots are certified to fly. Write each of the following queries in SQL.</p> <ol style="list-style-type: none">Find the names of aircraft such that all pilots certified to operate them have salaries more than \$80,000.For each pilot who is certified for more than three aircraft, find the eid and the maximum cruising range of the aircraft for which she or he is certified.Find the names of pilots whose salary is less than the price of the cheapest route from Los Angeles to Honolulu.For all aircraft with cruising range over 1000 miles, find the name of the aircraft and the average salary of all pilots certified for this aircraft.Print the enames of pilots who can operate planes with cruising range greater than 3000 miles but are not certified on any Boeing aircraft.Compute the difference between the average salary of a pilot and the average salary of all employees (including pilots).Print the name and salary of every nonpilot whose salary is more than the average salary for pilots.Print the names of employees who are certified only on aircrafts with cruising range longer than 1000 miles, but on at least two such aircrafts.Print the names of employees who are certified on all aircraftsList the flights that have second highest price	20	CL3	CO3
4	<p>Consider the following relations: employee (<u>person-name</u>, street, city) works (<u>person-name</u>, <u>company-name</u>, salary) company (<u>company-name</u>, city) manages (<u>person-name</u>, <u>manager-name</u>)</p> <p>Write the relational algebra expressions for the following queries</p>	20	CL3	CO3

	<ol style="list-style-type: none"> Find the names and cities of residence of all employees who work for First Bank Corporation. Find the names, street address, and cities of residence of all employees who work for First Bank Corporation and earn more than \$10,000 per annum. Find the names of all employees in this database who live in the same city as the company for which they work. Find the names of all employees who live in the same city and on the same street as do their managers. Find the names of all employees in this database who do not work for First Bank Corporation. Find the names of all employees who earn more than every employee of Small Bank Corporation. Find all companies located in every city in which Small Bank Corporation is located. Find the company with the smallest payroll. Find the company that has the most employees. Find the city that has all employees of Sahyadri Bank Corporation Company. 			
5	<p>Convert following schemas to 3NF, showing all intermediate stages, i.e. 1NF and 2NF.</p> 	10	CL3	CO4
6	<p>Consider a relation scheme $R=(A, B, C, D, E, H)$ on which the following functional dependencies hold: $\{A \rightarrow B, BC \rightarrow D, E \rightarrow C, D \rightarrow A\}$. What are the candidate keys of R?</p> <p>Consider the universal relation $R = \{A, B, C, D, E, F, G, H, I, J\}$ and the relation R with five attributes ABCDE. You are given the following dependencies: $A \rightarrow B$, $BC \rightarrow E$, and $ED \rightarrow A$.</p> <ol style="list-style-type: none"> List all keys for R. Is R in 3NF? Is R in BCNF? 	15	CL3	CO4
7	<ol style="list-style-type: none"> Consider the transactions T1, T2, and T3 and the schedules S1 and S2 given below. $T1: r1(X); r1(Z); w1(X); w1(Z)$ $T2: r2(Y); r2(Z); w2(Z)$ $T3: r3(Y); r3(X); w3(Y)$ $S1: r1(X); r3(Y); r3(X); r2(Y); r2(Z); w3(Y); w2(Z); r1(Z); w1(X); w1(Z)$ $S2: r1(X); r3(Y); r2(Y); r3(X); r1(Z); r2(Z); w3(Y); w1(X); w2(Z); w1(Z)$ Which one of the following statements about the schedules is TRUE? (A) Only S1 is conflict-serializable. (B) Only S2 is conflict-serializable. (C) Both S1 and S2 are conflict-serializable. (D) Neither S1 nor S2 is conflict-serializable. Consider two transactions T₁ and T₂ and four schedules S₁, S₂, S₃, S₄ of T₁ and T₂ as given below: $T_1: R_1[x] W_1[x] W_1[y]$ $T_2: R_2[x] R_2[y] W_2[y]$ $S_1: R_1[x] R_2[x] R_2[y] W_1[x] W_1[y] W_2[y]$ $S_2: R_1[x] R_2[x] R_2[y] W_1[x] W_2[y] W_1[y]$ $S_3: R_1[x] W_1[x] R_2[x] W_1[y] R_2[y] W_2[y]$ $S_4: R_2[x] R_2[y] R_1[x] W_1[x] W_1[y] W_2[y]$ Which of the above schedules are conflict-serializable? 	10	CL3	CO5

Cognitive Levels of Bloom's Taxonomy

No.	CL1	CL2	CL3	CL4	CL5	CL6
Level	Remember	Understand	Apply	Analyze	Evaluate	Create

Course Outcomes

CO1	Understand the basic concepts of data base system.	CL2
CO2	Develop appropriate databases by applying the various concepts of Relational Model.	CL4
CO3	Understand and apply Structure Query Language (SQL) to solve various database operations.	CL3
CO4	Design standard databases for various real world problems.	CL3
CO5	Illustrate the basic concepts of transaction processing in Database System.	CL3