30/05/24
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Registration No:

JECRC University
Department of Computer Science & Engineering
End Semester Examination May/June 2024
B. Tech - IV Semester
Subject: Database Management System (BCO010C)

Time: 3 hrs. **Maximum Marks: 100**

Instructions:

1. *Attemptall thequestions.*
2. *Illustrateyouranswerswithsuitableexamplesanddiagrams,wherevernecessary.*
3. *Writerelevantquestionnumbers beforewritingtheanswer.*

CourseOutcomes:

CO1: Awareness of database management basics and different models that we use for database. CO2: Design and architecture of relational model, relational algebra and SQL queries.
CO3: Implement different form of normalization.
CO4: Logical representation of internet database.
CO5: Analysis and concepts of transaction, concurrency and recovery systems

(5*2=10 Marks)

Section A

Q.1[CO1] Differentiate between candidate key and primary key?
Q.2 [CO2]Categorize the different types of relational Calculus with an example?
Q.3[CO3]what you know about Canonical Cover?
Q.4 [CO4] what are the concurrency control schemes?
Q.5[CO5]Can you force the database to use an index on a query?.

(5* 7=35 Marks)

Section B

Q.1 [CO1] Explain the overall system architecture of DBMS in detail?
Q.2 [CO2] Explain the various types of integrity constraints in database with an example
Q.3[CO3] Differentiate between partial Functional Dependency and Full Functional Dependency?
Q.4[CO4]Explain the concept of testing methods for Serializability.
Q.5 [CO5] what is the difference between B-Tree and Bitmap Index?

(5* 11=55 Marks)

Section C

Q.1 [CO1] Construct an ER Diagram for Company having following details:

I. Company organized into DEPARTMENT. Each department has unique name and a particular employee who manages the department. Start date for the manager is recorded. Department may have several locations.
II. A department controls a number of PROJECT. Projects have a unique name, number and a single location
III. Company's EMPLOYEE name, ssno, address, salary, sex and birth date are recorded. An employee is assigned to one department, but may work for several projects (not necessarily controlled by her dept). Number of hours/week an employee works on each project is recorded; The immediate supervisor for the employee.
IV. Employee's DEPENDENT is tracked for health insurance purposes (dependent name, birthdate, relationship to employee).

Q.2 [CO2] 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)

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 'JohnSmith'
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.

Q.3 [CO3] Given a relation R(P, Q, R, S, T, U, V, W, X) and Functional Dependency set FD = { $PQ \rightarrow R$, $QS \rightarrow TU$, $PS \rightarrow VW$, and $P \rightarrow X$ }, determine candidate key and check whether the given R is in 3NF? If not convert it into 3 NF?
Q.4 [CO4] Check whether the given schedule S is view serializable or not. If yes, then give the serial schedule.
S : $R_1(A)$, $W_2(A)$, $R_3(A)$, $W_1(A)$, $W_3(A)$
Q.5 [CO5]what is clustered index? When would using a clustered index make sense? What is the difference between a Clustered and Non Clustered Index?