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Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: VII - THEORY EXAMINATION (2024 - 2025)

Subject: Database Management System

Time: 3 Hours Max. Marks: 100

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*

1. This Question paper comprises of three Sections -A, B, & C. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.

2. Maximum marks for each question are indicated on right -hand side of each question.

3. Illustrate your answers with neat sketches wherever necessary.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION-A 20

1. Attempt all parts:-

1-a. Identify the option that is not an advantage of a database. (CO1,K2) 1

(a) Sharing of Data

(b) Reduce Data Redundancy

(c) Increase Data Inconsistency

(d) Data Security

1-b. Storing a separate copy of the database at multiple locations refers to: (CO1,K1) 1

(a) Vertical Partitioning

(b) Horizontal and Vertical Partitioning

(c) Data Replication

(d) Horizontal Partitioning

1-c. If you do not specify ASC or DESC after a SQL ORDER BY clause, which of the following is used by default _____. (CO2,K2) 1

(a) ASC

(b) DESC

(c) There is no default value

(d) None

1-d. The term "TCL" stands for _____. (CO2,K1) 1

(a) Ternary Control Language

(b) Transmission Control Language

(c) Transaction Central Language

(d) Transaction Control Language

1-e. Number of operands used by Binary Operators are: (CO3,K1) 1

(a) 1

(b) 2

(c) 3

(d) 4

1-f. Select _____ dept_name from instructor, Identify the one that displays the unique values of the column. (CO3,K2) 1

(a) All

(b) From

(c) Distinct

(d) Name

1-g. A relation in which every non-key attribute is fully functionally dependent on the primary key and which has no transitive dependencies, is said to be in _____. (CO4,K2) 1

(a) BCNF

(b) 2NF

(c) 3NF

(d) 1NF

1-h. If attributes A and B determine attribute C, then it is also true that _____. (CO4,K1) 1

(a) $A \rightarrow C$.

(b) $B \rightarrow C$.

(c) (A,B) is a composite determinant.

(d) C is a determinant.

1-i. If a transaction has obtained a _____ lock, it can read but cannot write on the item. (CO5,K1) 1

(a) Shared mode

(b) Exclusive mode

(c) Read only mode

(d) Write only mode

1-j. If a schedule is conflict equivalent to a serial schedule it is _____. (CO5,K2) 1

(a) Conflict serializable

(b) Conflicting

(c) Non serializable

(d) None of the mentioned

2. Attempt all parts:-

2.a.	Discuss the concept of weak entity type along with its representation. (CO1,K2)	2
2.b.	Write the difference between DROP and TRUNCATE statements in SQL. (CO2,K3)	2
2.c.	Define Referential Integrity. (CO3,K1)	2
2.d.	Determines the all-possible Candidate keys from given set of FD. R = (A, B, C, D, E, F) and the set of functional dependencies F ={A → C, C → D, D → B, E → F}. (CO4,K3)	2
2.e.	Explain atomicity of transactions in DBMS with the help of example. (CO5,K2)	2

SECTION-B 30

3. Answer any five of the following:-

3-a.	Compare between File System and DBMS. (CO1,K4)	6
3-b.	Explain degree of a relationship in E-R Model? Discuss its types. (CO1,K2)	6
3-c.	Give two examples with syntax for each type of command: DDL, DML, DCL,TCL. (CO2,K2)	6
3-d.	Write a syntax of UPDATE command. Demonstrate with suitable example. (CO2,K3)	6
3.e.	Explain different types of joins. (CO3,K2)	6
3.f.	Given a relation R(P, Q, R, S, T, U, V, W, X, Y) and Functional Dependency set FD = { PQ → R, P → ST, Q → U, U → VW, and S → XY}, determine whether the given R is in 3NF? If not convert it into 3 NF. (CO4,K3)	6
3.g.	Explain the conditions that are necessary for a deadlock to occur. (CO5,K2)	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	Convert the following schema into ER Diagram: STUDENT (Student_ID, Student_Name, DOB, Street, City, Pin) CLASS (Class_ID, Class_Name, Student_ID, DateOfJoin, Hours) Student_ID is the foreign key refers STUDENT table SUBJECT (Subject_ID, Subject_Name, Teacher, Student_ID) Student_ID is the foreign key refers STUDENT table SECTION (Section_ID, Class_ID, Section_Name) Class_ID is the foreign key refers CLASS table. (CO1,K2)	10
4-b.	Construct an E-R diagram for a hospital with a set of patients and a set of medical doctors. Associate with each patient a log of the various tests and examinations conducted. (CO1,K5)	10

5. Answer any one of the following:-

5-a.	Consider the following schema: EmployeeDetails(EmpId, FullName, ManagerId, DateOfJoining, City), EmployeeSalary(EmpId, Project, Salary, Variable) Answer the following questions using SQL queries: (i) Write an SQL query to fetch the EmpId and FullName of all the employees working under Manager with id. (ii) Write an SQL query to fetch the different projects available from the EmployeeSalary table. (iii) Write an SQL query to find the maximum, minimum,	10

and average salary of the employees. (iv) Write an SQL query to fetch the employees whose name begins with any two characters, followed by a text and ending with any sequence of characters. (CO2,K5)

5-b. Consider the following relational database schema student(Student_ID,Stu_Name, Stu_Subject_ID, Stu_Marks, Stu_Age), Subject(Subject_ID, Subject_Name) (i) Write a query to create the table in Structured Query Language. (ii) Write a query to insert the data into the table. (iii) Write a query to view the specific record of the table by using the WHERE clause. (iv) Write a query to access the first record from the SQL table. (CO2,K5) 10

6. Answer any <u>one</u> of the following:-

6-a. Explain the operators SELECT, PROJECT, UNION with suitable examples. (CO3,K2) 10

6-b. Explain the execution of the LEFT OUTER JOIN, elaborate the process by assuming tables. (CO3,K2) 10

7. Answer any <u>one</u> of the following:-

7-a. Let a relation R (A, B, C, D) and functional dependency {AB→C, C→D, D→A}. Relation R is decomposed into R1(A, B, C) and R2(C, D). Check whether decomposition is dependency preserving or not. (CO4,K3) 10

7-b. Given a relational Schema R(W, X, Y, Z) and set of Function Dependency FD = { W→ X, Y →X, Z→ WXY, WY→ Z }. Find the canonical cover. (CO4,K4) 10

8. Answer any <u>one</u> of the following:-

8-a. Discuss the deferred update technique of recovery. Discuss the advantages and disadvantages of this technique. Explain the reason it is called the NO-UNDO/REDO method. (CO5,K2) 10

8-b. Define schedule and its types? Explain view serializable and cascadeless schedule with suitable example of each. (CO5,K2) 10