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Total No. of Pages : 03

Total No. of Questions : 09

B.Tech.(CSE/IT) (Sem.-5)

DATABASE MANAGEMENT SYSTEM

Subject Code : CS-305

Paper ID : [A0466]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. SECTION-B contains **FIVE** questions carrying **FIVE** marks each and students has to attempt any **FOUR** questions.
3. SECTION-C contains **THREE** questions carrying **TEN** marks each and students has to attempt any **TWO** questions.
4. Please make necessary assumptions if needed.

SECTION-A

1. Answer briefly :

- (a) Write any four advantages of database management system?
- (b) How network model differs from hierarchical model?
- (c) What is a weak entity? Specify the symbol used to represent it in ER model.
- (d) What is the difference between super key and candidate key? Give one example for each.
- (e) Write a query in Domain as well as in tuple calculus to display all the records from the table.
- (f) Explain the use of **where** and **having** clause in SQL by giving example.
- (g) Create a view in SQL. How it differs from base table?.
- (h) Discuss the different transaction states.
- (i) What is the objective of serializability?
- (j) What is shadow paging?

SECTION-B

2. What is E-R model? Write the uses of E-R model. Draw the E-R model for any database of your choice. Specify different entities, their attributes, cardinalities and degrees of the relationships in the ER model.
3. Consider the following database schema for supplier-parts-projects database (suppliers(Sno) supply parts(Pno) to projects(Jno)) :

Supplier(Sno, Sname, date_of_Birth, birth_place)

Parts(Pno, Pname, color, weight, city).

Project(Jno, Jname, city)

Shipment(Sno, Pno, Jno, qty)

Write queries in SQL to :

- (i) Create the supplier table.
 - (ii) Retrieve the average quantity supplied to each project, Jno.
 - (iii) Add a new constraint on parts weight : Weight should not be null.
 - (iv) Retrieve the supplier nos of the suppliers supplying qty > 30.
 - (v) Display the total qty supplied by supplier 'Hari'.
4. Normalize the following database in 2NF and 3NF:

Student(course_code, CName, TeacherName, Rollno, SName, Sys_used, Hrly_rate, Total_Hrs)

Also, explain the insert and delete anomalies of 1NF, 2NF and 3NF.

[Assumptions : Each student studies number of courses. Only one system is assigned to each student.

Cname, Sname stands for Course name and student name respectively.

5. What is a transaction? What are the desirable properties of transactions? Discuss.
6. Explain the locking techniques of concurrent execution of transaction with suitable example.

SECTION-C

7. a) What is data independence? How it is achieved in DBMS? Explain. **5**
- b) Write the uses of relational calculus. **2**
- c) Consider the database schema given in QIII, write queries in relational algebra to : **3**
- (i) retrieve the details of each project.
 - (ii) retrieve the supplier numbers supplying qty to Project with Jno=5.
 - (iii) retrieve the details of the parts, which are supplied by supplier, Sno>5.
8. Explain Deferred database modification and immediate database modification recovery techniques. **10**
9. Write short note on :
- a) Functional dependencies
 - b) Access control
 - c) Concurrency control **10**