

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination, ~~MAY~~ 2019

B. Tech/ M. Tech (as applicable) in Computer Science & Engineering, Semester VI

Roll No.....

COURSE CODE: CSE401

Time: 2 hours

Max. Marks: 30

COURSE TITLE: Database Management Systems

Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.

Q.1 Create a B-tree and B+ tree of order 5 for the data :

06

A G F B K D H M J E S I R X C L N T U P

- a) Explain the process of insertion.
- b) Delete node F.
- c) Delete M from non-leaf node

Q.2 Consider the following database relations containing the attributes

04

Book - id

Subject - Category - of - book

Name - of - Author

Nationality - of - Author

With book - id as the primary key.

- (a) What is the highest normal form satisfied by this relation?
- (b) Suppose the attributes Book - title and Author - address are added to the relation, and the primary key is changed to {Name - of - Author, Book - title}, what will be the highest normal form satisfied by the relation?

Q.3A Consider the following relations :-

06

- instructor(ID, name, dept_name, salary)
- teaches(ID, course_id, sec_id, semester, year)
- course(course_id, title, dept_name, credits)

- a) Find the names of all instructors in the Music department, along with the titles of the courses that they teach.
- b) Find the course_id and semester of all those courses where credits are more than 3.

Perform the following query in SQL and relational algebra and explain the process of query optimization. Write an optimal solution for the above stated queries.

Q.4 Consider the transactions T1, T2, and T3 and the schedules S1 and S2 given below. 04

T1 : r1 (X) ; r1 (z) ; w1 (X) ; w1 (z)

T2 : r2 (X) ; r2 (z) ; w2 (z)

T3 : r3 (X) ; 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)

Draw suitable diagram for the schedules and justify whether Schedule S1 and S2 is conflict serializable or not .

OR

Q.4 Consider three data items D1, D2, and D3, and the following execution schedule of transactions T1, T2, and T3. In the diagram, R(D) and W(D) denote the actions reading and writing the data item D respectively. 04

T1	T2	T3
	R(D3); R(D2); W(D2);	
R(D1); W(D1);		R(D2); R(D3);
		W(D2); W(D3);
R(D2); W(D2);	R(D1); W(D1);	

Check whether the schedule is serializable or not and if serializable state the order of transactions.

Q. 5 Consider a Sales Tracking System Food product of different companies are sold in the market. Each product is having a unique code. To introduce the products in the market the company recruits sales representatives. The job of the sales representatives is to market the product. Salesman get commission by selling the products in the market. The value of the commission depends on the quantity sold. The sales representatives get motivation from the earned commission apart from the salary A company recruits more than one sale representative to market its product resulting in one-to-many relationship among COMPANY and SALES_REP. 10

- Draw a ER Model and corresponding Use Case Model for the same with clearly stating your assumptions.
- Convert the ER model into relational model.
- Identify 5 different queries you wish to execute from the model.