

THE KAVERY ENGINEERING COLLEGE
(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2025

Fourth Semester

Computer Science and Engineering

CS3492 - Database Management Systems

(Common to Information Technology)

Regulations - 2021

Duration : 3 Hrs

Maximum : 100 Marks

PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)

Q.No	Questions	BLT	CO	Marks																								
1.	Point out the importance of Object based data model.	L2	1	2																								
2.	Consider the given table & Write a query to find all the employees whose salary is between 50000 to 100000.	L3	1	2																								
	<table><tr><th>Emp ID</th><th>Emp Position</th><th>Date of Joining</th><th>Salary</th></tr><tr><td>1</td><td>Manager</td><td>01/05/2019</td><td>500000</td></tr><tr><td>2</td><td>Executive</td><td>02/05/2019</td><td>75000</td></tr><tr><td>3</td><td>Manager</td><td>01/05/2019</td><td>90000</td></tr><tr><td>2</td><td>Lead</td><td>02/05/2019</td><td>85000</td></tr><tr><td>1</td><td>Executive</td><td>01/05/2019</td><td>300000</td></tr></table>	Emp ID	Emp Position	Date of Joining	Salary	1	Manager	01/05/2019	500000	2	Executive	02/05/2019	75000	3	Manager	01/05/2019	90000	2	Lead	02/05/2019	85000	1	Executive	01/05/2019	300000			
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3.	Assess how 'Boyce-Codd normal form is found to be stricter than third normal form'.	L2	2	2																								
4.	Consider the relation scheme R(A,B,C) with the following functional dependencies: A,B→C, C→A, B→C→A. Show that the scheme R is the Third Normal Form (3NF) but not in Boyce-Codd Normal Form (BCNF).	L3	2	2																								
5.	Show the time stamps associated with each data item.	L2	3	2																								
6.	Discuss the need of shadow paging.	L1	3	2																								
7.	Summarize the procedure to reduce the occurrences of bucket overflows in a hash file organization.	L2	4	2																								
8.	What are the factors to be considered for the evaluation of indexing and hashing techniques?	L2	4	2																								
9.	State CAP theorem.	L1	5	2																								

10. List out security issues in database. L2 5 2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

Q.No	Questions	BLT	CO	Marks
11.	a Consider the employee database, where the primary keys underlined. employee(empname,street,city)works(empname,companyname,salary)company (companyname,city) manages(empname,management) Give an expression in the relational algebra for each request. i) Find the names of all employees who work for First Bank Corporation. ii) Find the names, street addresses and cities of residence of all employees who work for First Bank Corporation and earn more than 200000 per annum. iii) Find the names of all employees in this database who live in the same city as the company for which they work. Or b Consider the relational table given below and assess about the following SQL queries. Employee (Empno, Name, Department, Salary). (i) list all the employees whose name starts with the letter 'L'. (ii) Find the maximum salary given to employees in each department. (iii) Find the number of employees working in 'accounts' department. (iv) Find the second maximum salary from the table.	L3	1	16
12.	a i A car-rental company maintains a database for all vehicles in its current fleet. For all vehicles, it includes the vehicle identification number, license number, manufacturer, model, date of purchase, and color. Special data are included for certain types of vehicles: • Trucks: cargo capacity. • Sports cars: horsepower, renter age requirement. • Vans: number of passengers. • Off-road vehicles: ground clearance, drive train (four- or two-wheel drive). Construct an E- R model for all operations i Explain lossless Decomposition. Or b i Consider the following database relations containing the attributes Book-id Subject-Category-of-book Name-of-Author Nationality-of-Author With book-id as the primary key.	L5	2	10
		L2	2	6
		L5	2	10

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?

	i		L2	2	6
	i	Describe your own database to illustrate 3NF.			
13.	a	i	L2	3	8
		i	L4	3	8
		i			
		What benefit does rigorous two-phase locking provide? Show how does it compare with other forms of two-phase locking?			
		Or			
	b	i	L2	3	8
		i	L4	3	8
		i			
		Define the term Recoverable schedule and Cascade less schedules.			
		How transactions are to be written to Avoid deadlock and guarantee correct execution. Illustrate with suitable example.			
14.	a	i	L2	4	8
		i	L3	4	8
		i			
		With simple algorithms, define the computing of nested loop join and block nested loop join.			
		Or			
	b	i	L2	4	8
		i			
		Describe the different methods of implementing variable length records.			
		i	L3	4	8
		i			
		How do you represent leaf node of a B+ tree of order p?			
15.	a	i	L2	5	8
		i	L2	5	8
		i			
		Describe query processing and optimization in distributed databases.			
		Or			
	b	i	L2	5	8
		i			
		Explain the role of user privileges in controlling access to a database?			
		i	L2	5	8
		i			
		Discuss encryption and public key infrastructures in database security.			