VIT
Vellore Institute of Technology
(Deemed to be University u/s 3 of UGC Act, 1956)
CHENNAI

Reg. Number:	

Continuous Assessment Test II – October 2024

Programme	:	B.Tech (CSE)	Semester	:	Fall Semester 2024-2025
Course Code & Course Title	:	BCSE302L & Database Systems	Slot (s)	:	D1+TD1
Faculty	:	Dr. Premalatha M Dr. Gayathri devi S Dr. Vijayakumar K P	Class Numbers	:	CH2024250101247 CH2024250101250 CH2024250101256
Duration	:	90 Mins	Max. Mark		50

Answer all questions

Q. No	Sub Sec.	Description	Marks
1.		Consider the following relation and normalize it till Boyce-Codd-Normal Form by considering the below functional dependencies: managerID → managerName, area employeeID → employeeName managerID → employeeID, sectorID sectorID → sectorName	10
2.	a)	The XYZ Company has XYZ Market, XYZ Fresh, XYZ Smart Mart and Trends at various places in many cities across different states. This company purchases and sells many products such as Vegetables, Fruits, Groceries, Home Appliances, and Clothes. Thus, the company has to maintain the details of their products such as BranchCode, ProductId, Pname, Quantity and Price. Assume that there are 10 product details. For the records assumed, identify and justify the indexing (Primary/Secondary/Multilevel) that is most appropriate for the above specification. Construct the index structure of the identified indexing method associated with the above specification and show the changes in the index structure while inserting 3 different products and deleting 2 different products.	7
	b)	Apply Linear, Quadratic and double hashing techniques to implement the open hashing concept for the set of key values (13, 2, 3, 6, 11, 18, 73, 85). Assume that size of the bucket is 10 where h1(Key)=Key%10 and h2(Key)=1+(Key%7). Identify and discuss the appropriate schema architecture for the given scenario with suitable diagram	8
3.		Consider the following relational schemas: movie(movie_id, title, release_year, genre) actor(actor_id, actor_name, age, nationality) act(movie_id, actor_id, role, salary)	15

managerID	managerName	area	employeeID	employeeName	sectorID	sectorName
1	Adam J.	East	1 2	Daniel C. Elgi E.	4 3	Finance IT
2	Brian B.	West	3 4 5	George G. Henry H. Ilona I.	2 1 4	Security Administrator Finance
3	Catty C.	North	6 7	James J. Ken K.	1 4	Administrator Finance

		Write the SQL and Relational Algebra expressions for the following: Note: Use only natural join i. Find total salary of all actors who acted on the movies released in the year 2023 (2 Marks) ii. List the name of all the actors who acted in the movie 'The Inception' (2 Marks) iii. Find all actors who are from the 'USA' and acted in movies of the genre 'Action.' (3 Marks) iv. Draw the step-by-step query optimization tree for optimizing the relational algebra expression for the sub-section iii. Also, write the optimal relational algebra expression for the same. (8 Marks)	
4.	a)	Consider the following concurrent schedule and check if it satisfies conflict serializability and conflict equivalence based on the impact of READ and WRITE operation. Justify your answer. (6 marks)	10

T11	T12	T13
Read(A)		
A = f(A)		
Read(B)		
Write(A)		
A = f(A)		
	Read(C)	
Write(B)		
	Read(A)	
		Read(B)
	C = f(C)	
	Write(C)	
		B = f(B)
		Read(C)
		Write(B)
	A = f(A)	
	Write(A)	
		C = f(C)
		Write(C)

	b)	A Schedule S is as given below. Check whether the schedule S is view serializable or not. Justify your answer. (4 marks). S:{T1: Read(A) T2: Read(A) T3: Write(A) T1: Write(A) T2: Read(B) T3: Write(B) T1: Read(B) T2: Write(B) T1: Write(B)}	

*****ALL THE BEST*****