

Continuous Assessment Test (CAT) - II - October 2025

Programme	:	B.Tech	Semester	:	Fall Semester 2025-26
Course Code & Course Title	••	BCSE302L Database Systems	Slot	•	B1+TB1
Faculty	••	Dr.Jani Anbarasi L Dr.Bhuvaneswari Dr.Ashoka Rajan R Dr.Leninisha Shanmugam Dr.Vijayakumar K P Dr.Sandhya Dr.Sujatha M	Class Number		CH2025260100624 CH2025260100628 CH2025260100625 CH2025260100632 CH2025260100622 CH2025260100634 CH2025260100630
Duration	:	90 Minutes	Max. Mark		50 Marks

General Instructions:

- Write only your registration number on the question paper in the box provided and do not write other information
- Use statistical tables supplied from the exam cell as necessary
- Use graph sheets supplied from the exam cell as necessary
- Only non-programmable calculator without storage is permitted

Answer all questions

Q. No	Sub Sec.	Description				Marks
1	Bee.	Consider the below given relation and the functional dependencies and apply normalization until it reaches Boyce Codd Normal Form.				
		(a) R (A,B,C,D,E,F,G,H,I,J,K) FD = {A \rightarrow BCD, E \rightarrow FGHI, J \rightarrow K, H \rightarrow I, EJ \rightarrow G} (b) R (A,B,C,D,E,F,G,H) FD = {AB \rightarrow CD, B \rightarrow E, E \rightarrow F, F \rightarrow G, G \rightarrow H, C \rightarrow A}				
2		following Employee	giment teature as teature con court se	Led to the Color	delational Algebra queries for t	he
2		Employee Eid	Ename	City	delational Algebra queries for t	he
2		following Employee	giment teature as teature con court se	Led to the Color	delational Algebra queries for t	he look
2		Employee Eid 101	Ename Ravi Traders	City Mumbai	delational Algebra queries for t	
2		Employee Eid 101 202	Ename Ravi Traders Star Supplies	City Mumbai Pune	delational Algebra queries for t	

Items

IID	Iname	
A1	screws	
B2	washers	
C3	gears	
D4.	bearings	
E5	shafts	

Inventory

Eid	IID	icost
101	A1	50
101	СЗ	120
202	A1	55
202	D4	75
303	B2	20
404	A1	48
404	B2	22
404	E5	95
505	C3	110
505	D4 ·	70

- 1. Retrieve the item names supplied by employees located in Mumbai.
- 2. Retrieve the Eids of employees who supply every item.
- 3. For each employee, retrieve Eid and the number of distinct items available in the inventory.
- 4. Retrieve the employee names who have not listed any items in the inventory.
- 5. Retrieve the Eid of the employee(s) who have listed the minimum cost for the item screws.

An open-addressed hash table has m = 8 slots and is initially empty. Insert the following keys one by one:

12, 47, 33, 28, 19, 44, 50, 37, 15, 25

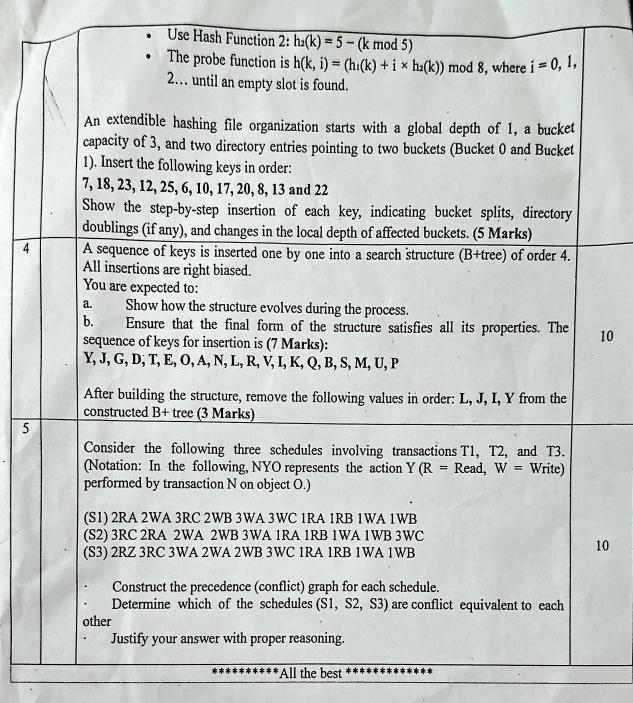
3

Perform the insertions using the following probing strategies:

- 1. Quadratic Probing: (2 Marks)
 - Use the hash function $h(k, i) = ((k \times 5 + 1) + i^2) \mod 8$, where i = 0, 1, 2... until an empty slot is found.

10

- 2. Double Hashing: (3 Marks)
 - Use Hash Function 1: h₁(k) = k mod 8



Ellen