

**VIT**Vellore Institute of Technology
(Deemed to be University under section 3 of U.G. Act, 1956)

REG.NO.:

**SCHOOL OF COMPUTER SCIENCE AND ENGINEERING
CONTINUOUS ASSESSMENT TEST - II
WINTER SEMESTER 2024-2025**

SLOT: B1

Programme Name & Branch : B.Tech.-CSE with Business Systems
 Course Code and Course Name : CBS1007 Database Systems
 Faculty Name(s) : Dr. P.Natarajan
 Class Number(s) : VL2024250505147
 Date of Examination : 17-3-2025
 Exam Duration : 90 minutes

Maximum Marks: 50**General instruction(s):**

- Answer All Questions
 - M - Max mark; CO - Course Outcome; BL - Blooms Taxonomy Level (1 - Remember, 2 - Understand, 3 - Apply, 4 - Analyse, 5 - Evaluate, 6 - Create)
 - Course Outcomes (Type the CO statements covered in this question paper. Use the CO number as per the syllabus copy)
4. Use the concepts of data normalization to analyse, measure and evaluate the performance of a database application
 5. Ability to grant and revoke privileges and comprehend database recovery techniques
 6. Construct efficient SQL queries to retrieve and manipulate data as required

Q. No	Question	M	CO	BL
1.	Find the minimal cover for the following dependencies $M = \{ HI \rightarrow J, J \rightarrow H, IJ \rightarrow K, HJK \rightarrow I, K \rightarrow L, K \rightarrow N, IL \rightarrow J, JN \rightarrow I, JN \rightarrow K, JL \rightarrow H, JL \rightarrow N \}$	10	4	5
2.	Suppose a relational schema R (A B C D E F G H I) and set of functional dependencies $F: \{ AB \rightarrow C, AD \rightarrow GH, BD \rightarrow EF, A \rightarrow I, H \rightarrow J \}$ Check out that relation is in 3NF or not? If not decompose it in 3NF	10	4	4
3.	Convert the following SQL query into an equivalent Relational Algebra expression. Show the step by step conversion of the SQL Query. SELECT R.A, S.B, T.E FROM R, S, T WHERE R.C=S.C AND S.D=T.D AND R.A>5 AND S.B<3 AND T.D=T.E	10	6	5
4.	Elucidate the steps involved in processing the given high-level query and apply heuristics rules to optimize the internal representation on the following library schema: Student (sid, name, age, address) Book (bid, title, author)	10	6	3



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	Checkout (sid, bid, date) SELECT S.name FROM Student S, Book B, Checkout C WHERE S.sid=C.sid AND B.bid=C.bid AND B.author='OldenFames' AND S.age>12 AND S.age<20			
5.	Identify the suitable ACID properties for the following situations 5.a. Let's assume I have a shop in which I sell spherical cube, now one day a customer came to me and said that I want 7.5 cubes from you, now tell me will I be able to give him 7.5 cubes or not ?? Reason your answer. 5.b. Where "t1" transaction is working on some value(10) and "t1" has to add (5) into the existing value, but in-between "t2" transaction came and add "25" into the already existing value(10) and makes it 35. So now "t1" will add (5) to (35) and not (10). Find out the final value after completing this transactions. 5.c. If you solve two medium questions everyday on "Leetcode", but one day you solved one-easy and one-medium question and on the same day I asked you how many questions you have solved, will the answer changed from 2 to any other number ?? Reason your answer 5.d. let's assume a situation where you was busy on Sunday because you have to: • visit the doctor • pay your electricity bill • go for a grocery shopping and that's why you refuse to your friend's offer of watching a movie together. Right now your friend meet you next day that is as on Monday and ask the reason for not coming to movie. You have to answer him with your own reasons.	10	5	5
