

B.TECH(CSE/AI), SEMESTER V EXAMINATION(Backlog), 2024**PAPER- BTCSE-502****DATABASE MANAGEMENT SYSTEM***Time: Three Hours**Maximum Marks: 75***Section-A*****Answer ALL questions from this section (5 X 7= 35 marks)***

Q.No	Questions	Marks	CO	BL
1.	Explain the term database and DBMS. Also write advantages of DBMS over file system.	7	CO1	BL1
2.	Explain the different types of Integrity constraints.	7	CO1	BL1
3.	Explain various Armstrong's Inference rule for Functional Dependencies	7	CO2	BL2
4.	What are the pitfalls in relational database design? With a suitable example, explain the role of functional dependency in the process of normalization.	5	CO3	BL4
5.	Explain the concept of Specialisation and Generalization	5	CO3	BL2
6.	For a relation R(A,B,C,D,E,F,G) and FD's { $A \rightarrow B$, $BC \rightarrow DE$, $AEF \rightarrow G$ }. Prove that $ACF \rightarrow DG$.	5	CO4	BL3
7.	Construct an E-R diagram for a car-insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents. State any assumptions you make.	5	CO3	BL6

Section-B***Answer any FOUR questions from this section (4 X 10= 40 marks)***

Q. No	Questions	Marks	CO	BL
8.	Explain Full Outer Join, Left Outer Join & Right Outer Join with suitable example.	10	CO3	BL1
9.	Consider Schema: EMPLOYEE(e_name, Street, city) WORKS_FOR(e_name, c_name, salary) COMPANY(c_name, city) MANAGES(e_name, manager_name) Answer the following queries in Relational Algebra and SQL:	10	CO2	BL5

	(i) Find names of employees working for Infosys. (ii) Find the names and the cities of residence of employees working for TCS. (iii) Find name, street, and city of residence of employees working for Infosys and earning more than 50000. (iv) Find the names of the employee who are not working for Wipro. (v) Find the total and average salary paid by each Company.			
10	(a) For a given relation R(ABCD) and FD's { AB $\rightarrow$ CD, D $\rightarrow$ A}. Decompose the relation R into 3NF. (b) For a given R(ABCDEFGH) with following FD's: { A $\rightarrow$ BCDEFGH, BCD $\rightarrow$ AEFGH, BCE $\rightarrow$ ADFGH, CE $\rightarrow$ H, CD $\rightarrow$ H }. Find a BCNF decomposition of R.	10	CO3	BL5
11	What do you mean by a transaction? What are the desired properties of transaction? Discuss the transaction state diagram and different states.	10	CO4	BL2
12	Why do we need Normalization? Explain the difference between 3NF & 2NF with example.	10	CO5	BL3
13	Write short notes on any TWO: (a) Datawarehouse (b) B+ Tree (c) Applications of DBMS (d) Data Independence	5+5	CO4	BL2
