

B.TECH (CSE), SEMESTER V (SUPPLEMENTARY) EXAMINATION, 2023**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 characteristics of DBMS that distinguish it from a File Processing System.	5	CO1	BL2
2.	Explain the three tier architecture of DBMS.	5	CO1	BL1
3.	Distinguish between Physical Data Independence and Logical Data Independence.	5	CO3	BL3
4.	What is data Integrity? Explain the types of integrity constraints in Relational model.	5	CO2	BL2
5.	Develop an ER diagram using aggregation that captures the following information: Teacher teaches different subjects. Teacher teaching a particular subject uses a reference book. State any options you make.	5	CO2	BL6
6.	What are Keys in DBMS and explain the different keys in DBMS	5	CO4	BL1
7.	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	CO3	BL5

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

Q.No	Questions	Marks	CO	BL
8.	a) Explain various Armstrong's Inference rule for Functional Dependencies. b) Explain Functional Dependency. Also discuss Trivial & Non trivial FD's.	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)	10	CO2	BL3

	Answer the following queries in Relational Algebra and SQL : (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. (vi) Find names of employees working in the same city where they live.							
10.	Why do we need Normalization? Explain the difference between 3NF & 2NF with example.	10	CO3	BL2				
11.	Discuss the characteristics of ACID properties in Transaction. Also draw the transaction state diagram.	10	CO4	BL2				
12.	(a) What are the 3 conditions that determine if an action (A_1) from one transaction takes precedence over an action (A_2) in a different transaction? (b) Consider the following two transactions and schedule (time goes from top to bottom). Is this schedule conflict-serializable? Explain why or why not. <table><tr><td>Transaction T_0</td><td>Transaction T_1</td></tr><tr><td>$r_0[A]$ $w_0[A]$ $r_0[B]$ $w_0[B]$ c_0</td><td>$r_1[A]$ $r_1[B]$ c_1</td></tr></table>	Transaction T_0	Transaction T_1	$r_0[A]$ $w_0[A]$ $r_0[B]$ $w_0[B]$ c_0	$r_1[A]$ $r_1[B]$ c_1	5+5	CO1	BL4
Transaction T_0	Transaction T_1							
$r_0[A]$ $w_0[A]$ $r_0[B]$ $w_0[B]$ c_0	$r_1[A]$ $r_1[B]$ c_1							
13.	Write short notes on any TWO : (a) Hashing (c) Concurrency Control (b) DML & DDL (d) B ⁺ Tree	5+5	CO4	BL2				
