Reg. No.																

Question Paper Code	14287

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2025

Fourth Semester

Computer Science and Engineering

(Common to Information Technology & Computer Science and Engineering (IoT)

20CSPC402 - DATABASE MANAGEMENT SYSTEMS

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	In SQL, which of the following is used to remove a table from the database? (a) DELETE TABLE (b) DROP TABLE (c) REMOVE TABLE (d) ERASE TABLE	1	K1	CO1
2.	A foreign key is used to: (a) Uniquely identify a record (b) Establish a relationship between two tables (c) Ensure data redundancy (d) Create indexes on the table	1	K1	CO1
3.	In ....., a composite attribute is decomposed into individual attributes. (a) 1st Normal Form (b) 2nd Normal Form (c) 3rd Normal Form (d) BCNF	1	K1	CO2
4.	Which one among the following, Fifth Normal Form (5NF) focuses on handling dependencies in a database. (a) Partial (b) Multi-valued (c) Transitive (d) Join	1	K1	CO2
5.	In which property of a transaction is it guaranteed that all or none of the operations are executed? (a) Consistency (b) Isolation (c) Durability (d) Atomicity	1	K1	CO3
6.	Which of the following isolation levels ensures that a transaction does not read uncommitted data from another transaction? (a) Read Uncommitted (b) Read Committed (c) Repeatable Read (d) Serializable	1	K1	CO3
7.	What is the main purpose of the Two-Phase Locking (2PL) protocol in a database management system? (a) To reduce the number of transactions (b) To ensure conflict-serializability of transactions (c) To increase data redundancy (d) To allow simultaneous updates to the same data item	1	K1	CO4
8.	The expansion of RAID is..... (a) Redundant arrays of inexpensive disks (b) Repeated arrays of inexpensive disks (c) Repeated arrays of disks (d) Redundant arrays of informative disks	1	K1	CO4
9.	In query processing, purpose of a buffer pool is---------- (a) To organize data into a tabular format. (b) To temporarily hold a copy of frequently accessed data. (c) To manage the physical storage of data. (d) To retrieve and manipulate data based on user queries.	1	K1	CO5
10.	The data model followed by XML is..... (a) Relational (b) Temporal (c) object oriented (d) hierarchal	1	K1	CO6

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

		Marks	K – Level	CO
11.	Contrast single valued and multi valued attributes.	2	K2	CO1
12.	What is a data dictionary?	2	K1	CO1
13.	What is meant by normalization of data?	2	K1	CO2
14.	Illustrate how Boyce-Codd normal form is found to be stricter than third normal form.	2	K2	CO2
15.	Define wound and wait schedule.	2	K1	CO3
16.	Classify the growing and shrinking phase.	2	K2	CO3
17.	What is bit level stripping and block level stripping?	2	K1	CO4

18.	List out the types of file organization.	2	K1	CO4
19.	List the steps involved in query processing.	2	K1	CO5
20.	Define indexing and List the different types of indexing.	2	K1	CO5
21.	Compare homogeneous and heterogeneous databases.	2	K2	CO6
22.	List out the two types of fragmentation.	2	K1	CO6

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Discuss the architecture of a database management system with suitable diagram.	11	K2	CO1
		OR			
	b)	Demonstrate an E-R diagram for the "Restaurant Menu Ordering System", which will facilitate the food items and services within a restaurant. The entire restaurant scenario is detailed as follows. The customer is able to view the food items menu, call the waiter, place orders and obtain the final bill through the computer kept in their table. The Waiters through their wireless tablet PC are able to initialize a table for customers, control the table functions to assist customers, orders, send orders to food preparation staff (chef) and finalize the customer's bill. The Food preparation staff (chefs), with their touch-display interfaces to the system, is able to view orders sent to the kitchen by waiters. During preparation they are able to let the waiter know the status of each item, and can send notifications when items are completed. The system should have full accountability and logging facilities, and should support supervisor actions to account for exceptional circumstances, such as a meal being refunded or walked out on.	11	K2	CO1
24.	a)	Explain in detail about multivalued dependencies and fifth normal Form with an example.	11	K2	CO2
		OR			
	b)	Summarize in detail about First and Second Normal forms with necessary examples.	11	K2	CO2
25.	a)	Discuss ACID properties which are followed before and after a transaction to preserve database consistency.	11	K2	CO3
		OR			
	b)	Explain deadlock prevention in detail with an example.	11	K2	CO3
26.	a)	Describe the different types of file organization methods. How are records organized in each method, and what are the advantages and disadvantages of each?	11	K2	CO4
		OR			
	b)	Illustrate the concept of Two-Phase Locking (2PL) and its significance in ensuring serializability in database transactions.	11	K2	CO4
27.	a)	Develop the different index schemes used in database systems and how each scheme helps in improving query performance.	11	K3	CO5
		OR			
	b)	Construct a B-tree of order 3 (i.e., each node can have a maximum of 2 keys and 3 children). Start with an empty B-tree and perform the following operations: Insert 10, 20, 5, 6, 30, 15, and 25. After inserting the above numbers, delete 10 and 20. What is the final structure of the B-tree after all insertions and deletions?	11	K3	CO5
28.	a)	Describe in detail about the various approaches used for storing a relation in distributed databases.	11	K2	CO6
		OR			
	b)	Explain the role of Document Type Definition (DTD) in XML databases. How does DTD ensure the validity of XML documents?	11	K2	CO6