R16

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QUESTION BANK (DESCRIPTIVE)

Subject with Code: Database Management System(16CS511)   **Course &Branch: B.Tech** –ECE, ME, CE
Year &Sem: IV-B.Tech& I-Sem   **Regulation: R16**

UNIT – I

INTRODUCTION TO DATABASE SYSTEM AND DATA BASE DESIGN

1	(a)	Define Database? Discuss about applications of Database Systems?	[L1][CO1]	**[6M]**
	(b)	List out the purpose of Database Systems.	[L1][CO1]	**[6M]**
2	(a)	Explain about Views of data.	[L2][CO1]	**[6M]**
	(b)	Explain about various data models.	[L2][CO1]	**[6M]**
3	(a)	Explain the Architecture of Database with a neat diagram.	[L4][CO1]	**[6M]**
	(b)	Write a short note on Database users and administrators?	[L3][CO1]	**[6M]**
4		Explain about Database languages with examples?	[L4][CO1]	**[12M]**
5	(a)	Classify i)Database ii) DBMS iii) List the database Applications	[L4][CO1]	**[6M]**
	(b)	Outline the Data Abstraction and discuss levels of Abstraction?	[L2][CO1]	**[6M]**
6		Explain about ER model and Component of ER Diagram.	[L4][CO1]	**[12M]**
7	(a)	Write about logical database design (ER to Relational) with suitable examples?	[L3][CO2]	**[6M]**
	(b)	Give an example of Attribute and List various types of attributes.	[L2][CO1]	**[4M]**
	(c)	Define Relationship set.	[L1][CO1]	**[2M]**
8		Explain about integrity constraints over relations?	[L4][CO1]	**[12M]**
9		Construct ER Diagram for University(i.e. Banking system, Hospital management system, Railway Reservation system, Online Shopping)	[L6][CO2]	**[12M]**
10	(a)	Create the DDL Commands – Table Creation, Altering the table structures, truncating a table and dropping a table.	[L6][CO1]	**[6M]**
	(b)	Implementthe DML Commands – Insert, Select Commands,update& delete Commands.	[L6][CO1]	**[6M]**

UNIT – II
RELATIONAL ALGEBRA AND CALCULUS, FORM OF BASIC SQL QUERY

1	(a)	Identify relational database query?	[L2][CO2]	**[6M]**
	(b)	Distinguish GROUP by and HAVING clauses with examples?	[L5][CO2]	**[6M]**
2	(a)	Illustrate different operations in Relational algebra with an example?	[L2][CO2]	**[6M]**
	(b)	Explain about triggers and active databases.	[L4][CO2]	**[6M]**
3		Classify the Relational calculus in detail?	[L2][CO2]	**[12M]**
4	(a)	Define NULL VALUE? Describe the effect of null values in database?	[L1][CO2]	**[6M]**
	(b)	Distinguish different types of aggregate operators with examples in SQL?	[L4][CO2]	**[6M]**
5	(a)	Evaluate project, join, select and product set operators with examples.	[L5][CO2]	**[6M]**
	(b)	Describe the SET operators with example.	[L1][CO2]	**[6M]**
6	(a)	Develop the working of union, intersection and except operations	[L6][CO2]	**[6M]**
	(b)	Give an examples of clauses SELECT with an example.	[L2][CO2]	**[6M]**
7	(a)	Distinguish between two set theoretic operations of relational algebra with an example.	[L2][CO2]	**[6M]**
	(b)	Create a sub query to establish the WHERE, ANY,AS and ALL sub queries with example.	[L6][CO2]	**[6M]**
8	(a)	Write in detail about expressive power of algebra and calculus.	[L3][CO2]	**[6M]**
	(b)	Explain the structure of basic form of an SQL query with an example.	[L4][CO2]	**[6M]**
9		Categorize the types of joins?	[L4][CO2]	**[12M]**
10	(a)	Express a nested query?	[L2][CO2]	**[2M]**
	(b)	Create a nested query to find the names of sailors who have reserved both a red and Green boat?	[L6][CO2]	**[5M]**
	(c)	Construct a nested query to find the names of sailors who have reserved all boats?	[L6][CO2]	**[5M]**

UNIT – III

INTRODUCTION TO SCHEMA REFINEMENT, PROPERTIES OF DECOMPOSITIONS:

1.	a)	Illustrate redundancy and the problems that it can cause.	[L2][CO3] **[6M]**
	b)	Explain about Functional Dependency.	[L4][CO3] **[6M]**
2.		Explain in detail about 1NF, 2NF, 3NF and BCNF with example.	[L6][CO3] **[12M]**
3.		Discuss about 4NF/MVD with example.	[L2][CO3] **[12M]**
4.		Discuss about 5NF/PJNF with example.	[L2][CO3] **[12M]**
5.	a)	Discuss about Armstrong Axiom's in functional Dependency.	[L4][CO3] **[6M]**
	b)	Define Decomposition. List out the properties of decomposition.	[L4][CO3] **[6M]**
6.	a)	Illustrate the types of anomalies with example.	[L4][CO3] **[6M]**
	b)	Let R (A, B, C) and F = (A → B). Prove that the decomposition of R into R1 (A, B) and R2(A, C) is lossless - join decomposition.	[L3][CO3] **[6M]**
7.	a)	Consider the schema: R (A, B, C, G, H, I) and the set of FD's (A → B, A → C, CG → H, CG → I, B → H). Prove the members of F^+: A → H, CG → HI, AG → I with axioms is true.	[L3][CO3]**[6M]**
	b)	Consider the relation scheme R = {E, F, G, H, I, J, K, L, M, M} and the set of functional dependencies {{E, F} -> {G}, {F} -> {I, J}, {E, H} -> {K, L}, K -> {M}, L -> {N} on R. What is the key for R?	[L5][CO3] **[6M]**
8.	a)	What is Normalization? List out the purpose normalization.	[L1][CO3] **[6M]**
	b)	Outline the terminologies: Partial Dependency, Transitive Dependency, Determinant, MVD, Join Dependency	[L2][CO3] **[6M]**
9.	a)	Compare 3NF and BCNF with example.	[L4][CO3] **[6M]**
	b)	The relation schema Student_Performance (name, courseNo, rollNo, grade) has the following FDs: name,courseNo->grade rollNo,courseNo->grade name->rollNo rollNo->name What is the highest normal form of this relation scheme?	[L3][CO3] **[6M]**
10.	a)	Compare Trivial and Non – Trivial Functional Dependencies with example.	[L4][CO3] **[6M]**
	b)	Explain the following with suitable example. (i) Full functional dependency. (ii) Partial dependency.	[L4][CO3] **[6M]**

UNIT – IV

TRANSACTION AND CONCURRENCY

1	(a)	Define a Transaction? List the properties of transaction	[L1][CO4]	**[6M]**
	(b)	Write briefly about serializability with example.	[L3][CO4]	**[6M]**
2	(a)	Discuss How do you implement Atomicity and Durability	[L6][CO4]	**[6M]**
	(b)	What is a Transaction? Explain the properties of the transaction. Explain the States of the transaction with a neat sketch.	[L4][CO4]	**[6M]**
3	(a)	Discuss different phases (states) of transaction?	[L2][CO4]	**[6M]**
	(b)	Define Schedule? What is a serial schedule?	[L1][CO4]	**[6M]**
4	(a)	Demonstrate Conflict Serializability?	[L2][CO4]	**[6M]**
	(b)	Illustrate Concurrent execution of transaction with examples	[L3][CO4]	**[6M]**
5	(a)	What are the states of transaction?	[L1][CO4]	**[6M]**
	(b)	What are the two statements regarding transaction?	[L1][CO4]	**[6M]**
6		Discuss various concurrency control protocols.	[L2][CO4]	**[12M]**
7		Analyze the Validation based protocols.	[L4][CO4]	**[12M]**
8		Explain buffer management in concurrency control system.	[L4][CO4]	**[12M]**
9		Explain Timestamp-Based Concurrency control protocol and the modifications implemented in it.	[L4][CO4]	**[12M]**
10		Identify the deadlock and 2-phase locking to ensure serializability in concurrency control with locking methods.	[L3][CO4]	**[12M]**

UNIT – V

RECOVERABILITY, PHYSICAL STORAGE AND DATABASE CONCEPTS

1	(a)	Discuss about file organizations and indexing?	[L6][CO5]	**[6M]**
	(b)	Explain about Index structures?	[L2][CO5]	**[6M]**
2	(a)	Categorize the file organizations in detail?	[L4][CO5]	**[6M]**
3	(a)	What is clustered index organization? Illustrate with example?	[L1][CO5]	**[6M]**
	(b)	Explain about Composite Search Keys? Illustrate with example?	[L4][CO5]	**[6M]**
4	(a)	Illustrate Tree indexes?	[L2][CO5]	**[6M]**
	(b)	Explain about ISAM?	[L4][CO5]	**[6M]**
5		Describe about B+ Trees Dynamic Indexing?	[L1][CO5]	**[12M]**
6		Explain about Search and Insert in Tree Structured Indexing?	[L2][CO5]	**[12M]**
7		Explain how to Delete and Duplicated in Tree Structured Indexing?	[L3][CO5]	**[12M]**
8	(a)	Discuss about static hashing	[L6][CO5]	**[6M]**
	(b)	Explain about Extendible hasing?	[L2][CO5]	**[6M]**
9	(a)	Explain about linear hashing	[L2][CO5]	**[6M]**
	(b)	Compare Extendible vs Linear hashing?	[L5][CO5]	**[6M]**
10	(a)	What is clustered index organization? Illustrate with example.	[L1][CO5]	**[6M]**
	(b)	Design example for Composite Keys?	[L6][CO5]	**[3M]**
	(c)	Define rotational latency time.	[L1][CO5]	**[3M]**

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