



SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR
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QUESTION BANK (DESCRIPTIVE)

Subject with Code : Database Management System (16CS511)
Year & Sem : II-B.Tech & II-Sem

Course & Branch : B.Tech –CSE
Regulation : R16

UNIT – I

INTRODUCTION TO DATABASE, DATABASE DESIGN AND RELATIONAL MODEL

1. (a) Define Database? Discuss about applications of Database Systems? [5M]
(b) Discuss about the purpose of Database Systems? [5M].
2. (a) What is Data Abstraction? Explain about different views of data? [5M]
(b) Define Instance and Schema? List different data models and explain? [5M]
3. Explain about Database languages with examples? [10M]
4. (a) Draw the Architecture of Database? [5M]
(b) Discuss about Database users and Administrators? [5M]
5. (a) Draw ER diagram for Ternary Relationship set with suitable example? [5M]
(b) Discuss about key constraints for Ternary Relationships? [5M]
6. Draw the ER diagram for a company needs to store information about employees (identified by ssn, with salary and phone as attributes), departments (identified by dno, with dname and budget as attributes), and children of employees (with name and age as attributes). Employees work in departments, each department is managed by an employee, a child must be identified uniquely by name when the parent (who is an employee; assume that only one parent works for the company) is known. We are not interested in information about a child once the parent leaves the company [10M]
7. Explain about integrity constraints over relations with examples. [10M]
8. Write about logical database design (ER to Relational) with suitable examples? [10M]
9. Discuss briefly about views? [10M]
10. (a) What is a weak entity? Explain with example? [2M]
(b) Explain about class hierarchy? [2M]
(c) Define Entity, Attributes, Entity set, relationship with appropriate notations? [2M]
(d) What is Relational Instance, Relational Schema? Give one examples? [2M]
(e) Draw the notation for multi-valued attributes? Give one example? [2M]

UNIT – II**RELATIONAL ALGEBRA AND CALCULUS, NESTED QUERIES**

- 1) a) Explain in detail about nested queries. [5M]
b) Explain about aggregate operators. [5M]
- 2) Write about relational algebra, Discuss about different operators used in algebra. [10M]
- 3) a) Differentiate the relational algebra and calculus. [5M]
b) Explain in detail about expressive power of algebra and calculus. [5M]
- 4) What are the variations in relational calculus? Explain with examples. [10M]
- 5) What is a join operator? Explain about conditional join and natural join with syntax and example. [10M]
- 6) How to list and update row in a table? Explain with syntax and examples. [10M]
- 7) What is meant by integrity constraint? Write about complex integrity constraints in sql [10M]
- 8) How can we compare using null values? Explain about logical connectives with examples. [10M]
- 9) a) Discuss about outer joins with examples. [5M]
b) Write about triggers and active databases. [5M]
- 10) a) Write query for finding the age of the youngest sailor who is eligible to vote for each rating level with at least two such sailors. [2M]
b) When can we use group by clause, explain. [2M]
c) Explain the structure of basic form of an SQL query. [2M]
d) List and Explain set operators of relational algebra. [2M]
e) Differentiate trigger with assertions. [2M]

UNIT – III**FUNCTIONAL DEPENDENCIES AND NORMALFORMS**

- 1) a) Differentiate BCNF with 3rd normal form. [7M]
b) Explain about denormalization. [3M]
- 2) a) Explain the following with suitable example: [5M]
i) non-loss decomposition ii) prime attributes
b) If $R = \{ A, B, C, D, E \}$ and FD's [5M]
 $F = \{ A \rightarrow C, AC \rightarrow D, E \rightarrow AD, E \rightarrow H \}$ List all the candidate keys.
- 3) a) What is redundancy? What are the problems caused by the redundancy? [5M]
b) Compute canonical cover F_c for the $R = \{ A, B, C, D \}$ and FD's = $\{ A \rightarrow BC, B \rightarrow C, A \rightarrow B, AB \rightarrow C, AC \rightarrow D \}$. [5M]
- 4) a) Prove that a relation which is in 4NF must be in BCNF. [5M]
b) Define and explain 4NF with suitable example. [5M]
- 5) a) Define BCNF. How does BCNF differ from 3NF? Explain with example. [6M]
b) Explain 3NF. Give one example. [4M]
- 6) a) Explain the following with suitable example. [5M]
i) Full functional dependency ii) Partial dependency
a) If $R = \{ A, B, C, G, H, I \}$ and FD's are [5M]
 $F = \{ A \rightarrow B, B \rightarrow HI, CG \rightarrow H \}$ Why R is not in 4NF? Explain.
- 7) Define normalization. List and Explain different normal forms with examples. [10M]
- 8) Explain about schema refinement in database design. [10M]
- 9) a) What is meant by multivalued dependency? Explain with example. [7M]
b) Write about problems related to decomposition.
- 10) a) What is meant by attribute closure? Explain. [2M]
b) Explain the classification of functional dependency. [2M]
c) List and Explain the properties of decomposition. [2M]
d) Prove that any relation schema with two attributes is BCNF. [2M]
e) Discuss about super key and candidate key in functional dependency with suitable example. [2M]

Unit – IV**Transaction Management**

1. a. Explain transaction management with relevant concept? [5M]
b. Explain transaction states with example? [5M]
2. Explain ACID properties of transaction management [10M]
3. What is serializability? Explain in detail its types [10M]
4. Discuss various concurrency control protocols. [10M]
5. Explain Lock based concurrency control protocols. [10M]
6. Explain Time-Stamp based and Thomas Write Rule protocols. [10M]
7. Explain Validation based protocols. [10M]
8. Explain about Log based recovery and ARIES algorithm. [10M]
9. What is database Recovery? Explain Shadow paging in detail. [10M]
10. Explain Buffer Management in concurrency control system [10M]

UNIT –V**Overview of Storage and Indexing, Tree Structured Indexing, Hash Based Indexing**

1. (a) Discuss about file organizations and indexing? [5M]
(b) Explain about Index structures? [5M]
2. Compare file organizations? [10M]
3. Explain about RAID levels. [10M]
4. (a) What is clustered index organization? Illustrate with example? [5M]
(b) Explain about Composite Search Keys? Illustrate with example? [5M]
5. (a) Illustrate Tree indexes ? [5M]
(b) Explain about ISAM? [5M]
6. Explain about B+ Trees Dynamic Indexing? [10M]
7. Explain about Search and Insert in Tree Structured Indexing? [10M]
8. Explain about Delete and Duplicated in Tree Structured Indexing ? [10M]
9. (a) Discuss about static hashing? [5M]
(b) Explain about Extendible hashing? [5M]
10. (a) Explain about linear hashing? [4M]
(b) Compare Extendible vs Linear hashing? [4M]
(c) Design example for Composite Keys? [2M]