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QUESTION BANK (DESCRIPTIVE)

Subject with Code : Database Management System (18CS0506) **Course & Branch :** B.Tech –CSE&CSIT
Year & Sem : II-B.Tech& I-Sem **Regulation :** R18

UNIT – I

INTRODUCTION TO DATABASE, DATABASE DESIGN AND RELATIONAL MODEL

Short Answer Questions

1. What is a weak and strong entity sets? Explain with example? [2M]
2. Explain about class hierarchy? [2M]
3. Define Entity, Attributes, Entity set, relationship with appropriate notations? [2M]
4. What is Relational Instance, Relational Schema? Give one examples? [2M]
5. Draw the notation for multivalued attributes? Give one example? [2M]
6. What is a data model? List the types of data model used [2M]
7. What are composite attributes? [2M]
8. What does the cardinality ratio specify? [2M]
9. What are the two types of participation constraint? [2M]
10. List any eight applications of DBMS [2M]

Long Answer Questions

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
7. (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]
8. Explain about integrity constraints over relations? [10M]
9. Write about logical database design (ER to Relational) with suitable examples? [10M]
10. List the database models and explain Architecture of database? [10M]
11. A college consists of number of employees working in different departments. In this context, create two tables' employee and department. Employee consists of columns empno, empname, basic, hra, da, deductions, gross, net, date-of-birth. The calculation of hra, da are as per the rules of the college. Initially only empno, empname, basic have valid values. Other values are to be computed and updated later. Department contains deptno, deptname, and description columns. Deptno is the primary key in department table and referential integrity constraint exists between employee and department tables? [10M]

UNIT – II**RELATIONAL ALGEBRA AND CALCULUS, NESTED QUERIES****Short Answer Questions**

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| 1. 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] |
| 2. When can we use group by clause, explain. | [2M] |
| 3. Explain the structure of basic form of an SQL query. | [2M] |
| 4. List and Explain set operators of relational algebra. | [2M] |
| 5. Differentiate trigger with assertions. | [2M] |
| 6. Define-relational algebra. | [2M] |
| 7. List and explain the types of keys | [2M] |
| 8. What are aggregate functions? And list the aggregate functions supported by SQL? | [2M] |
| 9. Define Primary key and Candidate key. | [2M] |
| 10. Write short notes on tuple relational calculus. | [2M] |

Long Answer Questions

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| 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) Explain Aggregate Operators with examples. | [10M] |

UNIT – III**FUNCTIONAL DEPENDENCIES AND NORMALFORMS****Short Answer Questions**

1. What is meant by attribute closure? Explain. [2M]
2. Explain the classification of functional dependency. [2M]
3. List and explain the properties of decomposition. [2M]
4. Prove that any relation schema with two attributes is BCNF. [2M]
5. Discuss about super key and candidate key in functional dependency with suitable example. [2M]
6. What is meant by lossless-join decomposition? [2M]
7. What are axioms? [2M]
8. List the SQL domain Types. [2M]
9. What is the need for triggers? [2M]
10. What is meant by computing the closure of a set of functional dependency? [2M]

Long Answer Questions

- 1) a) Differentiate BCNF with 3rd normal form. [7M]
- b) Explain about denormalization. [3M]
- 2) What are different types of normalization? Also explain the difference between BCNF and 3NF [10 M]
- 3) a) Prove that a relation which is in 4NF must be in BCNF. [5M]
- b) Define and explain 4NF with suitable example. [5M]
- 4) a) Define BCNF. How does BCNF differ from 3NF? Explain with example. [6M]
- b) Explain 3NF. Give one example. [4M]
- 5) a) Compare and contrast between third normal form and BCNF. [5M]
- b) Write about loss -less join decomposition with an example. [5M]
- 6) a) Discuss multivalued dependencies with fourth normal form with an example. [5M]
- b) Explain join dependencies with fifth normal form with an example. [5M]
- 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. [3M]
- 10) a) Compare and contrast between First normal form and second normal form. [5M]
- b) Write about loss -less join decomposition with an example. [5M]

Unit – IV**Transaction Management****Short Answer Questions**

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| 1. Define transaction management. | [2M] |
| 2. Define functional dependency | [2M] |
| 3. List and define ACID properties | [2M] |
| 4. Define validation based protocols | [2M] |
| 5. Explain lock based protocols | [2M] |
| 6. What are the properties of transaction? | [2M] |
| 7. Define deadlock. | [2M] |
| 8. What are the storage types? | [2M] |
| 9. Define shadow paging. | [2M] |
| 10. What is a recovery scheme? | [2M] |

Long Answer Questions

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| 1. Explain transaction management with relevant concept? | [10 M] |
| 2. Explain transaction states with example? | [10M] |
| 3. Explain ACID properties of transaction management | [10M] |
| 4. Define functional dependency and explain briefly? | [10M] |
| 5. Explain briefly normal forms? With relevant example | [10M] |
| 6. Explain serializability in transaction management | [10M] |
| 7. Explain concurrency control with lock based protocols | [10M] |
| 8. Explain classification of storage structure | [10M] |
| 9. Explain buffer management in concurrency control system | [10M] |
| 10. Explain Based Protocols and Timestamp Based Protocols | [10M] |

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

1. Give one Example for Extendible hashing? [2M]
2. Give one example for linear hashing? [2M]
3. Draw the structure of B+ tree? [2M]
4. Design example for Clustered indexes? [2M]
5. Design example for Composite Keys? [2M]
6. Define rotational latency time. [2M]
7. What is the use of RAID? [2M]
8. Distinguish between fixed length records and variable length records. [2M]
9. What are the techniques to be evaluated for both ordered indexing and hashing? [2M]
10. Define query optimization. [2M]

Long Answer Questions

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

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