**Code No: 155EU** **R18**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**
**B. Tech III Year I Semester Examinations, January/February - 2023**
**DATABASE MANAGEMENT SYSTEMS**
**(Common to CESE, CSE(CS), CSE(IOT), CSE(N))**

**Time: 3 Hours** **Max. Marks: 75**

**Note:** i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.



**PART – A**

**(25 Marks)**

| | | |
|---|---|---|
| 1.a) | What is abstraction? What are the levels of Abstraction in a DBMS? | [2] |
| b) | How to represent the strong entity set, weak entity set in ER-Model? | [3] |
| c) | Define views and tables. | [2] |
| d) | What is the need for domain relational calculus? | [3] |
| e) | Define Multi valued dependencies. | [2] |
| f) | What are the SQL statements used to update and insert the database? | [3] |
| g) | Define a transaction. | [2] |
| h) | Define atomicity and durability properties of the transactions. | [3] |
| i) | What is Primary Index? | [2] |
| j) | What are the differences between indexing and hashing? | [3] |

**PART – B**

**(50 Marks)**

2.a) Explain about view of the data, data abstraction and instance of the Schema.
b) How to represent the following in E-R model
i) Primary Key ii) Role [6+4]

**OR**

3.a) Develop an E-R Diagram for Library Management System.
b) Explain the structure of Database System. [5+5]

4.a) Illustrate different set operations in Relational algebra with an example.
b) Differentiate between tuple relation calculus and domain relation calculus. [6+4]

**OR**

5.a) Let R =(ABC) and S=(DEF). Let r(R) and s(S) both relations on schema R and S. Develop an expression in the Tuple relational calculus that is equivalent to each of the following.
i) $\sigma_{R=19}(r)$ ii) $\prod_{A,F}(\sigma_{C=D}(r \times s))$ iii) r∩s
b) Explain about various domain and integrity constraints in relational model with examples. [5+5]

6.a) Explain what are NULL values? Are they supported in relational model? How do they Effect the meaning of queries? Can primary key fields of table contain null values?
b) Explain about 1NF, 2NF and 3NF and BCNF normal forms with examples. [5+5]

**OR**

7.a) Explain various set operations used in SQL with examples.
b) Explain various aggregation operators in SQL with examples. [5+5]

8.a) Explain Validation- Based Protocols with example.
b) Explain the Time Stamp - Based Concurrency Control protocol. How is it used to ensure serializability? [5+5]

**OR**

9.a) Show that the two phase locking protocol ensure the serializability.
b) Explain multiple granularity locking approach and how does it works? [5+5]

10.a) Explain deletion and insertion operations in ISAM with examples.
b) What is Hashing? Explain how insert and delete operations are handled in a static hash index? [5+5]

**OR**

11.a) Explain insertion and deletion operations in B+ trees with example.
b) Explain the cluster index, primary and secondary indexes with examples. [5+5]

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