R18

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech II Year II Semester Examinations, April/May - 2023
DATABASE MANAGEMENT SYSTEMS
(Common to CSE, IT, ECM, CSBS, CSIT, ITE, CSE(AI&ML), CSE(DS))

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 are the goals of DBMS?	[2]
b)	Explain about DML language and query processor.	[3]
c)	Distinguish between super key and Candidate key.	[2]
d)	Explain Domain relational calculus.	[3]
e)	Define dependency preserving decomposition.	[2]
f)	What is the difference between 3NF and BCNF?	[3]
g)	Explain about durability of transaction.	[2]
h)	What is transaction? Explain its states.	[3]
i)	Why are tree-structure indexes are good for searches, especially range selections.	[2]
j)	What is the main difference between ISAM and B+ tree indexes?	[3]

PART – B

(50 Marks)

2.a) Identify the main components in a DBMS and briefly explain what they do?
  b) Explain the following:
    i) View of Data
    ii) Data Abstraction
    iii) Instances and Schemas.   [5+5]

OR

3.a) What is data model? Explain Relational Model and E-R model.
  b) Draw an ER-Diagram for Library Management system.   [5+5]

4.a) Differentiate between a relation schema and relation instance define the term arity and degree of a relation.
  b) Let R =(ABC) and let r1 and r2 both relations on schema R . Give an expression in the Domain relational calculus that is equivalent to each of the following: [5+5]
    i) $\prod_A(r1)$ ii) $\sigma_{B=17}(r1)$ iii) $r1 \cap r2$

OR

5.a) What is Relational Model? Explain about various domain and integrity constraints in Relational Model with examples.
  b) Explain various fundamental operations in relational algebra with examples.   [5+5]

6.a) What aggregate operators does SQL support ? Explain.
  b) Define Functional dependencies and Multi valued dependencies. How are primary keys related to FDs? [5+5]

OR

7.a) What are the conditions are required for a relation to be in 4NF and 3NF explain with examples.
  b) Explain various set operations are used in SQL with examples. [5+5]

8.a) What is locking Protocol? Describe the Strict Two Phase locking Protocol.
  b) Explain multiple granularity concurrency control scheme. [5+5]

OR

9.a) Explain the ACID Properties of transactions.
  b) What is log file? Explain the following log based recovery schemes.
  i) Deferred data base modification
  ii) Immediate data base modification. [5+5]

10.a) Explain about cluster index, primary and secondary indexes with examples.
  b) Explain Deletion and insertion operations in ISAM with examples. [5+5]

OR

11.a) Explain what are the differences between tree based and Hash based indexes.
  b) Explain deletion and insertion operation in *B+ trees*. [4+6]

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