

Code No: 154AM**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 r_1 and r_2 both relations on schema R . Give an expression in the Domain relational calculus that is equivalent to each of the following: [5+5]
 - i) $\prod_A(r_1)$
 - ii) $\sigma_{B=17}(r_1)$
 - iii) $r_1 \cap r_2$

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 primarykeys 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]

---ooOoo---

NIRCOM

your roots to success...

Code No: 154AM

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech II Year II Semester Examinations, August/September - 2021

DATABASE MANAGEMENT SYSTEMS

(Common to CSE, IT, ITE)

Time: 3 Hours

Max. Marks: 75

Answer any five questions
All questions carry equal
marks

- 1.a) Discuss about levels of abstraction in a DBMS.
b) What is a data model? What are the different data models? Explain. [7+8]
- 2.a) Define ER model and explain the following kinds of constraints that can be specified in the ER diagram, and give an example of each: i) key constraint ii) participation constraint.
b) Discuss the functionality of query evaluation engine. [8+7]
- 3.a) Discuss in detail about the properties of relation algebra.
b) Compare tuple relational calculus and domain relational calculus. [7+8]
4. Consider the following relations Sailors (sid, sname, rating, age) Boats (bid, bname, color) Reserves (sid, bid, day)
Write the statements in Relational Algebra, Relational Calculus, Domain Relational Calculus and SQL for the following questions.
a) Find the names of sailors who have reserved a Red boat.
b) Find the names of sailors who have reserved at least one boat.
c) Find the names of sailors who have reserved a Red and a Green boat.
d) Find the names of sailors who have reserved a Red or a White boat.
e) Find the names of sailors who have reserved all boats. [15]
- 5.a) What are the steps to be followed to convert a relation in 3NF to BCNF?
b) Discuss the importance of entity integrity and referential integrity constraints. [8+7]
- 6.a) When is the decomposition of a relation schema R into two relation schemas X and Y said to be lossless-join decomposition? Why is this property so important? Give a necessary and sufficient condition to test whether a decomposition is lossless-join.
b) Discuss fourth normal form with illustration. [8+7]
- 7.a) Discuss in detail about timestamp based concurrency control techniques.
b) Write about Log based recovery. [8+7]
- 8.a) State and explain various file organization methods. Give suitable examples to each of them.
b) What are the Pros and Cons of ISAM? [8+7]

R18

**Code No:
154AM**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year II Semester (Special) Examinations, January/February - 2021
DATABASE MANAGEMENT SYSTEMS**

(Common to CSE, IT)

Time: 2

hours

Max. Marks: 75

**Answer any five questions
All questions carry equal marks**

1. Explain the functions of Database Administrator. [15]
2. What is Relational Model? Distinguish between Super key, Candidate key, Primary Key for a relation with examples. [15]
3. What is normalization? Explain 2NF, 3NF and BCNF Normal forms with example. [15]
4. What is serializability? Explain conflict and view is serializability in detail. [15]
5. Describe insertion and deletion operations in B+ tree with example. [15]
- 6.a) Explain various levels of data abstraction and data independence.
b) Define generalization, specialization and aggregation? How it is represented in E-R Model? [7+8]
7. Let $R = (ABC)$ and let r_1 and r_2 both relations on schema R . Give an expression in the tuple relational calculus that is equivalent to each of the following.
a) $\prod_{A1}(r_1)$ b) $r_1 \cap r_2$ c) $r_1 - r_2$ [5+5+5]

your roots to success...

8. Explain various data manipulation and data definition statements in SQL with examples. [15]

---ooOoo---



your roots to success...