

R16**Code No: 134AP****JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B.Tech II Year II Semester Examinations, May - 2019****DATABASE MANAGEMENT SYSTEMS****(Common to CSE, IT)****Time: 3 Hours****Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full 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 DBMS? What are the advantages of DBMS? [2]
- b) Explain generalization, specialization and aggregation in E-R Model. [3]
- c) Define the terms primary key constraints and foreign key and check constraints. [2]
- d) Explain the following Operators in SQL with examples: i) SOME ii) NOT IN. [3]
- e) What is normalization? What are the conditions required for a relation to be in 1NF, 2NF? [2]
- f) Explain what are the problems caused by redundancy. [3]
- g) What is locking Protocol? [2]
- h) Explain the ACID Properties of transaction with examples. [3]
- i) What is Indexing and Hashing? [2]
- j) Explain what are the differences between tree based and Hash based indexes. [3]

PART – B**(50 Marks)**

- 2.a) Develop an E-R Diagram for Banking enterprise system. [5+5]
 - b) Explain the functions of Database Administrator. [5+5]
- OR**
- 3.a) Compare between super key, Candidate key, Primary Key for a relation with examples. [5+5]
 - b) Construct an ER-Diagram for a hospital with a set of patients and set of medical doctors. Associated with each patient a log of the various tests and examinations conducted. [5+5]
- 4.a) Explain the fundamental operations in relational algebra with examples. [5+5]
 - b) Explain various Domain constraints in SQL with examples. [5+5]
- OR**
- 5.a) Let $R = (ABC)$ and $S = (DEF)$ let $r(R)$ and $s(S)$ both relations on schema R and S . Formulate an expression in the Tuple relational calculus that is equivalent to each of the following.
i) $\prod_A(r)$ ii) $\sigma_{p=19}(r)$ iii) $r \bowtie s$ iv) $\prod_{A,E}(\sigma_{C=D}(r \bowtie s))$. [5+5]
 - b) Explain various DML functions in SQL with examples. [5+5]

- 6.a) When is a decomposition said to be dependency preserving? Why this property Useful? Explain.
- b) Determine the closer of the following set of functional dependencies for a relation scheme. $R(A,B,C,D,E,F,G,H)$,
 $F=\{ AB \rightarrow C, BD \rightarrow EF, AD \rightarrow G, A \rightarrow H \}$
List the candidate keys of R. [5+5]
- OR**
- 7.a) Suppose that we decompose the schema $R = (A, B, C, D, E)$ into $R_1 (A, B, C)$ and $R_2 (A, D, E)$. Determine that this decomposition is a lossless-join decomposition or dependency preserving if the following set F of functional dependencies holds:
 $A \rightarrow BC, CD \rightarrow E, B \rightarrow D, E \rightarrow A$
- b) Explain 2NF, 3NF and BCNF Normal forms with example. What is the difference between 3NF and BCNF? [5+5]
- 8.a) Explain the Time Stamp - Based Concurrency Control protocol. How is it used to ensure serializability?
- b) Explain the Check point log based recovery scheme for recovering the data base. [5+5]
- OR**
- 9.a) Explain multiple granularity of locking protocol with example.
- b) What is serializability? Explain. [5+5]
- 10.a) Explain about Validation-Based Protocol.
- b) Explain the Insertion and deletion Operations in B+ trees with example. [5+5]
- OR**
- 11.a) Explain Deletion and insertion operations in ISAM with example.
- b) Explain how does it handles insert and delete operations *Extendable hashing*? [5+5]

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