

Code No: 158DC

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech IV Year II Semester Examinations, July/August - 2022****DATABASE MANAGEMENT SYSTEMS****(Common to CE, ME, ECE, EIE)****Time: 3 Hours****Max.Marks:75****Answer any five questions
All questions carry equal marks**

- 1.a) What are the main benefits of using a DBMS to manage data in applications involving extensive access.
b) Explain the following in DBMS:
i) Levels of abstraction ii) Data independence. [7+8]
- 2.a) What is E-R model? How to represent the following in E-R model?
i) Weak entity set ii) Role iii) Multivalued Attribute iv) Strong entity set.
b) Draw an ER-Diagram for Library Management system. [8+7]
- 3.a) What is Relational Model? Distinguish between super key, Candidate key and Primary Key for a relation with examples.
b) Explain various fundamental operations in relational algebra with examples. [8+7]
- 4.a) Let $R=(ABC)$ and $S=(DEF)$ let $r(R)$ and $s(S)$ both relations on schema R and S . Give an expression in the Tuple relational calculus that is equivalent to each of the following.
i) $\prod_A(r)$ ii) $\sigma_{B=r^2}(r)$ iii) rXs iv) $\prod_{A,F}(\sigma_{C=D}(rXs))$.
b) Explain the following Operators in SQL with examples.
i) SOME ii) EXCEPT iii) INTERSECT iv) UNION. [8+7]
- 5.a) What is Trigger? How to implement Triggers in SQL?
b) What aggregate operators does *SQL* support? Explain with examples. [8+7]
- 6.a) What is Normalization? What are the conditions required for a relation to be in 2NF, 3NF and BCNF explain with examples.
b) Explain what are the problems caused by redundancy and decomposition of relation? [8+7]
- 7.a) Explain how the Two Phase Locking protocol is used to Control multiple transactions.
b) Explain about the multiple granularity Concurrency Control protocol. [7+8]
- 8.a) Explain about the cluster index, primary and secondary indexes.
b) Describe the Insertion and Deletion Operations in B+ trees. [7+8]

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