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Question Paper Code: U4C01

B.E./B.Tech. DEGREE EXAMINATION, APRIL 2024

Fourth Semester

Computer Science and Business Systems

21UCB401– DATABASE MANAGEMENT SYSTEM

(Regulations 2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. List the components of the storage manager. CO1-U
2. Mention the three levels of views used in DBMS. CO1-U
3. Outline the use of Commit and Rollback. CO1-U
4. Write the Armstrong's axioms. CO1-U
5. Define Functional Dependency. CO1-U
6. "BCNF is found to be stricter than third normal form". Justify the statement. CO1-U
7. Define the concept of concurrency control in database management systems. CO1-U
8. What is meant by log based recovery? CO1-U
9. List the properties of B trees. CO1-U
10. What is indexing and what are the different kinds of indexing? CO1-U

PART – B (5 x 16= 80 Marks)

11. (a) Explain E-R Model in detail with suitable example. CO1-U (16)
Or
(b) Briefly explain about Entity-Relationship model. CO1-U (16)
12. (a) With relevant examples discuss the various fundamental operations in Relational Algebra. CO1-U (16)
Or
(b) Explain about DDL, DML commands in SQL with examples. CO1-U (16)

13. (a) Consider a relation $R(A,B)$. R is in first normal form. Justify R is in second normal form, third normal form and BCNF. CO2-App (16)
- Or
- (b) Solve the statement by using Relation $R = (A, B, C, D)$ with Functional dependency $F = \{C \rightarrow D, C \rightarrow A, B \rightarrow C\}$. CO2-App (16)
- i. Identify all candidate keys for R .
 - ii. Identify the best normal form that R satisfies.
 - iii. Decompose R into a set of BCNF relations.
 - iv. Decompose R into a set of 3NF relations.
14. (a) Write notes on transaction and its states with example. Explain ACID properties. CO1-U (16)
- Or
- (b) Explain Timestamp based concurrency control algorithm with an example. CO1-U (16)
15. (a) Describe the different types of file organization with their advantages and disadvantages. CO1-U (16)
- Or
- (b) Explain the concept of query optimization in a database system. Discuss the role of heuristics and cost estimation techniques in optimizing query execution plans. CO1-U (16)