Exam Question Paper

Course: Data Communications

Instructor: Dr. Jane Doe
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Question No	Subquestion	Question Text	CO	BT	Marks
1a	a	How does DBMS address the limitations of traditional file-based systems, such as data redundancy and inconsistency?	1	3	4
1b	b	Explain the importance of database design process in ensuring scalability, performance, and security in database applications, using a systematic approach.	1	4	6
2a	a	Describe the differences between various types of entities and relationships in the ER model, and explain their importance in database design.	2	3	4
2b	b	Explain Codd's 12 rules for relational database systems, highlighting their significance in ensuring data integrity and consistency.	2	6	6
3a	a	Explain the concept of procedural programming within databases using PL/SQL, including stored procedures, functions, and triggers.	3	5	4
3b	b	Explain the importance of query optimization techniques, including indexing, caching, and parallel processing, in improving database performance.	3	5	6
4a	a	Explain the concept of transactions in databases, highlighting their importance in ensuring data consistency and integrity.	4	3	4
4b	b	Explain the recovery techniques used in databases to ensure fault tolerance and data consistency, including checkpointing, logging, and rollback.	4	4	6
5a	a	What are the different types of parallelism used in databases, including I/O parallelism, interquery, intraquery, intraoperation, and interoperation parallelism, and how do they improve database performance?	5	2	4
5b	b	Describe the trade-offs between consistency, availability, and partition tolerance in distributed systems, highlighting the CAP theorem and its implications.	5	6	6

Question No	Subquestion	Question Text	CO	BT	Marks
6a	a	Describe the different types of NoSQL databases, including key-value stores, document-oriented databases, column-family stores, and graph databases.	6	6	4
6b	b	Discuss the trade-offs between consistency, availability, and partition tolerance in NoSQL systems, highlighting the CAP theorem and its implications.	6	5	6