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Question Paper Code	13256
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B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2024

Fourth Semester

Computer Science and Engineering

(Common to Information Technology, Third Semester - Artificial Intelligence and Data Science & Computer Science and Engineering (AIML))

20CSPC402 - DATABASE MANAGEMENT SYSTEMS

Regulations - 2020

Duration: 3 Hours

Max. Marks: 100

PART - A (MCQ) (20 × 1 = 20 Marks)
Answer ALL Questions

	<i>Marks</i>	<i>K- Level</i>	<i>CO</i>
1. Which view of data provides the actual representation and storage of data? (a) Physical view (b) Logical view (c) Conceptual view (d) External view	1	K1	CO1
2. Which of the following is a fundamental concept of the relational model? (a) Trees (b) Graphs (c) Tables (d) Networks	1	K1	CO1
3. The _____ operation, denoted by $-$, allows us to find tuples that are in one relation but are not in another. (a) Union (b) Set- difference (c) Difference (d) Intersection	1	K1	CO1
4. Functional dependencies are a generalization of _____ (a) Key dependencies (b) Relation dependencies (c) Database dependencies (d) None of the mentioned	1	K1	CO2
5. _____ is the primary objective of Second Normal Form (2NF) in database normalization. (a) To eliminate duplicate rows in a table (b) To ensure that every non-prime attribute is fully functionally dependent on the primary key (c) To organize data into a two-dimensional table structure (d) To define primary and foreign key relationships	1	K1	CO2
6. Fifth Normal Form (5NF) focuses on handling _____ dependencies in a database. (a) Partial (b) Multi-valued (c) Transitive (d) Join	1	K1	CO2
7. A schedule where transactions are executed sequentially without overlapping is known as: (a) Serial schedule (b) Serializable schedule (c) Concurrent schedule (d) Preemptive schedule	1	K1	CO3
8. Which of the following isolation levels ensures that a transaction does not read uncommitted data from another transaction? (a) Read Uncommitted (b) Read Committed (c) Repeatable Read (d) Serializable	1	K1	CO3
9. Which type of lock prevents any other transaction from reading or writing to the locked data? (a) Shared lock (b) Exclusive lock (c) Intent lock (d) Deadlock lock	1	K1	CO3
10. In query processing _____ is the purpose of a buffer pool. (a) To organize data into a tabular format (b) To temporarily hold a copy of frequently accessed data (c) To manage the physical storage of data (d) To retrieve and manipulate data based on user queries	1	K1	CO4

11. In the context of query optimization _____ is the purpose of cost estimation. 1 K1 CO4
 (a) To manage the physical storage of data efficiently
 (b) To retrieve and manipulate data based on user queries
 (c) To provide a logical view of the database
 (d) To estimate the resource requirements and execution time of query plans
12. _____ is the primary role of partitioned hash join algorithms in optimizing JOIN operations. 1 K1 CO4
 (a) To manage the physical storage of data
 (b) To simplify the query language
 (c) To efficiently join large datasets by partitioning them based on hash functions
 (d) Partitioned hash join algorithms have no impact on JOIN operations
13. In _____ method of file organization, hash function is used to specify in which block of the file the record should be placed. 1 K1 CO5
 (a) stack (b) queue (c) heap (d) hashing
14. _____ is the purpose of using a directory in dynamic hashing. 1 K1 CO5
 (a) To store data records (b) To manage storage allocation
 (c) To optimize query performance (d) To organize and access buckets
15. The _____ level of RAID technology includes both error detection and correction. 1 K2 CO5
 (a) 1 (b) 2 (c) 3 (d) 4
16. In indexing, the _____ is a attribute or set of attributes used to look up records in a file. 1 K2 CO5
 (a) search key (b) row number (c) column name (d) primary key
17. In _____ type of replication, the relation is stored at all sites. 1 K1 CO6
 (a) half replication (b) full replication (c) partial replication (d) no replication
18. The process of deriving the properties of one class into the other class is called _____. 1 K1 CO6
 (a) Inheritance (b) method definition (c) data hiding (d) abstraction
19. The _____ tag is used to specify element name in XML schema. 1 K1 CO6
 (a) xsd:element (b) element (c) xsd:schema (d) xsd
20. _____ language is used as the standard for structuring and exchanging data over the Web. 1 K1 CO6
 (a) C (b) C++ (c) HTML (d) XML

PART - B (10 × 2 = 20 Marks)

Answer ALL Questions

21. What is the purpose of database management system? 2 K1 CO1
22. List the aggregate functions supported by SQL. 2 K1 CO1
23. What is meant by lossless-join decomposition? 2 K1 CO2
24. Why 4NF in Normal Form is more desirable than BCNF? 2 K1 CO2
25. Which method is used for detecting the deadlock situation? 2 K1 CO3
26. What are ACID Properties in database? 2 K1 CO3
27. What is meant by query evaluation plan? 2 K1 CO4
28. Define heuristic optimization. 2 K1 CO4
29. Differentiate Static Hashing and Dynamic Hashing. 2 K2 CO5
30. Define object oriented database system. 2 K1 CO6

PART - C (6 × 10 = 60 Marks)

Answer ALL Questions

31. a) Explain in detail about the different types of data models with suitable examples. 10 K2 CO1
- OR**
- b) Explain briefly about keys and its types with suitable examples. 10 K2 CO1

32. a) Define partial functional dependency and describe how this type of dependency relates to 2NF. 10 K2 CO2
- OR**
- b) What is a normal form? Explain the types of normal forms with relevant examples. 10 K2 CO2
33. a) Explain about Two-Phase Locking Protocol and outline the execution phase of a transaction. 10 K2 CO3
- OR**
- b) Explain in detail about the types of serializability with example. 10 K2 CO3
34. a) Summarize in detail about Heuristic optimization algorithms. 10 K2 CO4
- OR**
- b) Explain in detail about the various algorithms used for JOIN operations in SQL query processing. 10 K2 CO4
35. a) Explain in detail about the various levels of RAID systems with suitable diagrams. 10 K2 CO5
- OR**
- b) Briefly explain about the index schemes used in database systems. 10 K2 CO5
36. a) Explain about the various approaches used for storing a relation in distributed databases. 10 K2 CO6
- OR**
- b) Explain in detail about XML databases. 10 K2 CO6