

Code : 105312

2012 (A)

DATABASE MANAGEMENT SYSTEMS

Time : 3 hours

Full Marks : 70

Instructions :

- (i) The marks are indicated in right-hand margin.
 (ii) There are **TEN** questions in this paper.
 (iii) Attempt any **FIVE** questions.

1. (a) Define the term 'data model'. Explain different types of data model.
 (b) What is the goal of designing a database? Explain the overall database design and implementation process. 7+7
2. (a) Explain, in brief, various constraints that can be placed on specialization and generalization.
 (b) Explain aggregation with the help of a suitable example. 7+7

3. (a) Explain not-null constraint. How does a not-null constraint enforce domain integrity?
 (b) How are entity types and attributes mapped to relation schemas? Explain with the help of an example. 7+7
4. (a) What is outer join operation? Explain how it differs from the inner join operation.
 (b) Explain the division operation by giving an example. **akubihar.com** 7+7
5. (a) What is functional dependency? Give examples.
 (b) Explain the inference rules for functional dependencies. 7+7
6. (a) What is transitive dependency? Explain the normal form based on the concept of transitive dependency.
 (b) Consider a relation $R(A, B, C, D, E)$ with the functional dependencies $AB \rightarrow C$, $CD \rightarrow E$ and $DE \rightarrow B$. Is AE a candidate key of this relation? If not, which is the candidate key? Explain. 7+7

7. List the steps followed by heuristic query optimizer to transform an initial query tree into an optimal query tree. Give a suitable example in support of your answer. 14
8. What is a precedence graph? How can it be used to test the conflict serializability of a schedule? **akubihar.com** 14
9. Explain two-phase locking protocol with the help of an example. What are its disadvantages? How can these disadvantages be overcome? 14
10. What are log-based techniques? Explain deferred- and immediate-modification versions of the log-based recovery technique with the help of an example. 14

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