

(Following Paper ID and Roll No. to be filled in your Answer Book)

**PAPER ID : 1043**

Roll No.

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**B.Tech.**

EIGHTH SEMESTER EXAMINATION, 2005-2006

**ADVANCED CONCEPTS IN DATABASE SYSTEMS**

Time : 3 Hours

Total Marks : 100

- Note :**
- (i) Attempt **ALL** questions.
  - (ii) All questions carry equal marks.
  - (iii) In case of numerical problems assume data wherever not provided.
  - (iv) Be precise in your answer.

1. Attempt **any four** parts of the following : (5×4=20)
- (a) What are the steps involved in query processing ?
  - (b) What do you understand by query optimization ?
  - (c) Explain heuristic optimization. What are the main heuristics applied during query optimization ?
  - (d) What is pipelining in query processing ? What is system catalogue in RDBMS ?
  - (e) Discuss the reasons for converting SQL queries into relational algebra queries before optimization is done.

- (f) Clustering indices may allow faster access to data than a nonclustering index affords. When must we create a non clustering index, despite the advantages of a clustering index ? Explain your answer

2. Attempt *any four* parts of the following : (5x4=20)

- (a) For each of the following application areas, discuss why a relational database system would be inadequate. List all specific system components that would need to be modified.
- (i) Computer aided design
  - (ii) Multimedia databases
- (b) Consider a system that provides persistent objects. Is such a system necessarily a database system ? Explain your answer.
- (c) Explain how the concept of object identity in the object oriented model differs from the concept of tuple equality in the relational model.
- (d) Compare and contrast the object-oriented and object-relational database system.
- (e) What are nested relational model ? Discuss CLOB and BLOB.
- (f) Write a short note on Structured types in DBMS ?

3. Attempt *any two* parts of the following : (10x2=20)

- (a) Discuss the relative advantages of centralized and distributed databases. How would you differentiate between fragmentation transparency, replication transparency and location transparency ?

- (b) What is meant by data allocation in distributed database design ? What typical units of data are distributed over sites ?
- (c) Discuss the factors that do not appear in centralized systems that affect concurrency control and recovery in distributed systems. What are the different types of distributed database systems ?
4. Attempt *any two* parts of the following : (10x2=20)
- (a) What are the different issues in Database security ? What is Database audit ?
- (b) What is the difference between discretionary and mandatory access control ? What is meant by granting and revoking a privilege ?
- (c) What is a Statistical database ? Discuss the problem of statistical database security ?
5. Attempt *any two* parts of the following : (10x2=20)
- (a) Explain the terms :
- (i) Temporal databases
  - (ii) Spatial databases
  - (iii) Multimedia databases
  - (iv) Active databases
- (b) What are deductive databases ? How does data mining technology relate to data warehousing technology ?
- (c) What are open problems with web databases ? What solutions have been proposed to overcome the problem ?

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