

Total No. of Questions : 6]

SEAT No. :

**P4339**

**[4860]-1307**

[Total No. of Pages : 2

**M.E. (Computer Engineering)**  
**HIGH PERFORMANCE DATABASES**  
**(2013 Credit Pattern) (Semester - I) (510102)**

*Time :3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *All six questions are compulsory.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Assume Suitable data if necessary.*

**Q1) a)** Define database Workload. Explain automated tuning of database design. **[4]**

b) If you were about to create an index on a relation, what considerations would guide your choice? Discuss. **[5]**

- i) The choice of primary index.
- ii) Clustered versus un-clustered indexes.
- iii) Hash versus tree indexes.
- iv) The use of a sorted file rather than a tree-based index.
- v) Choice of search key for the index.

**Q2) a)** Explain Two Phase commit protocol to handle following failures in Distributed Environment. **[4]**

- i) Site Failure.
- ii) Coordinator Failure.
- iii) Network Partition.

b) Explain various transformations of global queries into fragment queries in distributed databases. **[4]**

**Q3) Solve Any Two:**

- a) Explain Transaction Management in Multi-databases with suitable example. **[4]**
- b) Consider a main-memory database system recovering from a system crash. Explain the relative merits of : **[4]**

**P.T.O.**

- i) Loading the entire database back into main memory before resuming transaction processing.
    - ii) Loading data as it is requested by transactions.
  - c) Write a short note on TP monitors. [4]
- Q4)** a) Give a relational schema to represent bibliographical information specified according to the DTD fragment given below. the relational schema must keep track of the order of author elements. Assume that only books and articles appear as top-level elements in XML documents. [4]
- ```

<!DOCTYPE bibliography [
  <!ELEMENT book (title, author +, year, publisher,place ?)>
  <!ELEMENT author (last_name, first_name)>
  <!ELEMENT title (# PCDATA)>
  ....similar PCDATA declarations for
  year, publisher, place, journal, year, number, volume,
  pages, last_name and first_name
]>

```
- Create XML document and XML schemas for above DTD.
- b) Write a short note on (Any One) [4]
    - i) SAX Parser
    - ii) XQuery
- Q5)** a) Consider a database of documents in which all documents are kept in a central database, Copies of some documents are kept on mobile computers. Suppose that mobile computer A updates a copy of document 1 while it is disconnected, and, at the same time, mobile computer B updates a copy of document 2 while it is disconnected. Show how the version-vector scheme can ensure proper updating of the central database and mobile computers when a mobile computer reconnects. [4]
- b) Explain Multimedia databases for Video Streaming Applications. [4]
- Q6)** a) Explain HDFS in Hadoop framework. [5]
- b) Explain database schema and transaction tuning with suitable example. [4]

