

**GUJARAT TECHNOLOGICAL UNIVERSITY****M. E. - SEMESTER – I • EXAMINATION – WINTER • 2014****Subject code: 3715306****Date: 12-01-2015****Subject Name: Database Technologies****Time: 02:30 pm - 05:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Design an E-R model of Gujarat Technological University(GTU), depicting attribute set, relationship set, attributes , mapping cardinalities, keys, extended features like generalization/specialization, aggregation. **07**
- (b) Define following terms: **07**  
(1) Entity (2) Relationship (3) Weak entity set (4) Composite attribute (5) Multivalued attribute (6) Primary key and (7) Discriminator
- Q.2** (a) Explain lossless join decomposition in brief with example. **07**
- (b) What is multivalued dependency? Explain 4NF in detail. **07**
- OR**
- (b) What is functional dependency? Explain BCNF in detail. **07**
- Q.3** (a) Design an XML file for Student Information System (SIS), which includes various personal and academic information of a student. Also write an XSD and DTD file for XML file you designed for SIS. **07**
- (b) What is query optimization? Explain it with suitable example relational algebras. **07**
- OR**
- Q.3** (a) What is query processing? Explain various steps involved in. **07**
- (b) Explain A1 and A2 algorithm for file scan and also estimates their respective costs. **07**
- Q.4** (a) What is distributed database? Explain 2PC protocol and various failures associated with it. **07**
- (b) What is parallel database? Explain various partitioning techniques along with their comparisons. **07**
- OR**
- Q.4** (a) Explain single lock manager and distributed lock manager approach for concurrency control in distributed database. **07**
- (b) Explain lock based and graph based protocols for concurrency control. **07**
- Q.5** (a) What is nesting and unnesting? Write an example queries to demonstrate arrays, multisets, and inheritance of SQL 1999 standard. **07**
- (b) Explain data mining and data warehousing in brief. **07**
- OR**
- Q.5** (a) What is recovery? Explain log based and shadow page recovery techniques. **07**
- (b) What is transaction? Explain conflict and view serializability with example schedules. **07**

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