

GUJARAT TECHNOLOGICAL UNIVERSITY**M. E. Sem – IV Examination May 2011****Subject code: 740201****Subject Name: Advanced Databases****Date: 16-05-2011****Time: 10:30 a.m. To 1:00 p.m.****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)** Explain materialization and pipelining. Evaluate the relational algebra expression for the query “Find the city’s names of all suppliers who are supplying part of red color and having weight < 50.0” using materialization and pipelining. Use relational database given below. **07**

Supplier (s_no, s_name, status, city)Parts(p_no, p_name, color, weight, city)Project(pj_no, pj_name, city)Shipment(s_no, p_no, quantity)

- (b)** Give the answers of following: **07**
1. Explain why 4NF is more desirable than BCNF.
 2. Let the relation Supplier and Parts have following properties. Supplier has 2000 tuples and Parts has 1000 tuples. 100 tuples of employee and 50 tuples of department fit in a block respectively. Estimate number of block transfer required using each of following join operation:
 - i) nested loop join
 - ii) block nested loop join

- Q.2 (a)** Give the answers of following: **04**
1. Explain Recovery log and no nested transactions. **04**
 2. Define the following terms: **03**
 - i) Wait –Die
 - ii) Wound –wait
 - iii) Interleaved schedule

- (b)** A database has four transactions. Let $min_sup = 60\%$ and $min_conf = 80\%$. **07**

cust_id	TID	items_bought (in the form of brand- item_category)
01	T100	{king’s-Crab, Sunset-Milk, Dairyland-Cheese, Best-Bread}
02	T200	{Best-Cheese, Dairyland-Milk, Goldenfarm-Apple, Tasty-Pie, Wonder-Bread}
01	T300	{Westcoast-Apple, Dairyland-Milk, Wonder- Bread, Tasty-Pie}
03	T400	{ Wonder-Bread , Sunset-Milk, Dairyland-Cheese}

Find all frequent item-sets using Apriori and also find all the association rules.

OR

- (b)** Give the answers of following:
1. Explain properties of transaction. **02**
 2. Explain data access protocol. **02**
 3. Draw the cuboid for data warehouse consists of dimensions time, employee, company and city. **03**

- Q.3 (a)** In the context of Internet (Web) database, state the differences between XML Schema and XML DTD. Create XML DTD and XML Schema for relational database given below. **07**
Employee(name,ssn, bdate, address, sex, salary, superssn, departments)
Department(deptname, deptno, mgrssn, mgrstardate)
- (b)** The following table consists of training data from an employee database. The data have been generalized. For given row entry, count represents the number of data tuples having the values for department, status, age and salary given in that row. **07**

Table 1

department	Status	age	salary	count
sales	Senior	31 to 35	46K to 50K	30
sales	Junior	26 to 30	26K to 30K	40
Sales	Junior	31 to 35	31K to 35K	40
Systems	Junior	21 to 25	46K to 50K	20
Systems	Senior	31 to 35	66K to 70K	5
Systems	Junior	26 to 30	46K to 50K	3
Systems	Senior	41 to 45	66K to 70K	3
marketing	Senior	36 to 40	46K to 50K	10
marketing	Junior	31 to 35	41K to 45K	4
secretary	Senior	46 to 50	36K to 40K	4
secretary	Junior	26 to 30	26K to 30K	6

Let status be the class label attribute.

Use ID3 algorithm to construct a decision tree from the given data.

OR

- Q.3 (a)** Use CART algorithm to construct a decision tree from the data given in Table 1. **07**
- (b)** Explain Support Vector machine with suitable example. **07**
- Q.4 (a)** In the context of Intra- Operation parallelism, discuss with suitable diagrams:
1. Partitioned join
2. Fragment and Replicate join **07**
- (b)** In the context of distributed database, explain distributed concurrency control based on distinguished copy of a data item and voting with suitable example **07**

OR

- Q.4 (a)** Explain the server system architecture of client server system (model). **07**
- (b)** In the context of parallel database system, Explain speed up and scale up. Explain factor that work against efficient parallel operation and can diminish speed up and scale up. Also explain parallel database architecture with suitable diagrams. **07**
- Q.5 (a)** Explain Mandatory access control for database security in detail. Also Discuss how it is differ from discretionary access control **07**
- (b)** Give the answers of the following. **07**
1. Discuss data management issues for Mobile database.
2. How to extract XML document from Relational databases? Explain with suitable example.

OR

- Q.5 (a)** Explain the tuning of indexes and tuning of queries for relational databases. **07**
- (b)** Give the answers of the following. **07**
1. Explain ECA model of Active database with suitable example.
2. Explain Clausal form and Horn clauses for Deductive database.