NED UNIVERSITY OF ENGINEERING & TECHNOLOGY, KARACHI
FINAL YEAR (COMPUTER SCIENCE AND INFORMATION TECHNOLOGY)
ANNUAL EXAMINATION 2007
BATCH 2003-04

Time: 3 Hours **Dated: 09-10- 2007**

Max. Marks: 80

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DISTRIBUTED DATABASE CLIENT SERVER PROGRAMMING
(CT-455)

Instructions:

1. **Q1. is compulsory.**
2. **Attempt any five questions in all.**
3. **Use given sample database wherever required.**
4. **Write SQL queries wherever applicable.**

Q1(a) Consider relation PROJ of sample database. Assume that the following applications (queries) are defined to run on this relation.

(i) Find the budget of a project, given its identification number.
(ii) Find the names and budgets of all projects.
(iii) Find the names of projects located at a given city.
(iv)Find the total project budgets for each city.

Construct an Attribute Usage Matrix? **[6]**

Q1(b) Using attribute usage value of part (a), construct Attribute Affinity Matrix. Given: **[4]**

$Acc_1(q1) = 15$	$Acc_1(q2) = 5$	$Acc_1(q3) = 25$	$Acc_1(q4) = 3$
$Acc_2(q1) = 20$	$Acc_2(q2) = 0$	$Acc_2(q3) = 25$	$Acc_2(q4) = 0$
$Acc_3(q1) = 10$	$Acc_3(q2) = 0$	$Acc_3(q3) = 25$	$Acc_3(q4) = 0$

Q1(c) Show result data for the following Relational Algebra queries (Any Four): **[8]**

1. $\sigma_{TITLE="Elect. Eng."}(EMP)$
2. $\pi_{PNO, BUDGET}(PROJ)$
3. $EMP \times PAY$
4. $EMP \bowtie_{EMP.TITLE=PAY.TITLE} (PAY)$
5. $EMP \ltimes_{EMP.TITLE=PAY.TITLE} (PAY)$

Q1(d) Eliminate redundant predicates from the following query: **[6]**

```
SELECT      TITLE  FROM  EMP
WHERE       (NOT (TITLE = "Programmer")
AND    (TITLE = "Programmer"
OR      TITLE = "Elect. Eng.")
AND    NOT (TITLE = "Elect. Eng."))
OR      ENAME = "J. Doe"
```

Q2(a) State Query Processing Problem and Objective of Query Processing. Give example where appropriate. **[6]**

Q2(b) Draw diagram for Layers of Query Processing. Briefly describe each step. **[6]**

Q2(c) Define Data Localization. **[2]**

Q3(a) Write advantages and disadvantages of Distributed DBMS (Three each). **[6]**

Q3(b) Write short note on transparencies in distributed DBMS. **[8]**

Q4(a) What is Query Decomposition? Explain four steps of Query Decomposition with examples. **[8]**

Q4(b) Explain Operator Tree? Draw Optimized Operator Tree for the following query: **[6]**
"Find the names of employees other than J. Doe who worked on the CAD/CAM project for either one or two years."

Q5(a) Explain Query Graph and Join Graph? Draw a Query Graph and Join Graph of the following query: **[8]**
"Find the names and responsibilities of programmers who have been working on the CAD/CAM project for more than 3 years".

Q5(b) Give the Query Graph of the following query: **[4]**
"Find employee name and project name of employees who have been working on any project for more than 12 months."

Q5(c) Define Data Security. **[2]**

Q6(a) Write a SQL query to create a view on the sample database which contains employee number and employee name for all the system analysts. **[4]**

Q6(b) Write a SQL query to find the names of all the system analysts with their project numbers and responsibilities using the view created in Part (a). **[4]**

Q6(c) What is Semantic Integrity Control? Give 2 examples each for Predefined constraints and precompiled constraints. **[6]**

Q7(a) Define Following (Any Four): **[8]**

(a) Unit of Distribution in Fragmentation
(b) Degree of Fragmentation
(c) Correctness Rules for Fragmentation
(d) Minterm Selectivity
(e) Access Frequency
(f) Vertical Fragmentation

Q7(b) What is Primary Horizontal Fragmentation? Explain with examples. **[6]**

Q8(a) What is Derived Horizontal Fragmentation? Explain with examples. **[5]**

Q8(b) Draw a block diagram of the following reference architectures (Any Two): **[5]**

(a) Peer-to-Peer Distributed Systems
(b) MDBS Architecture using Global Conceptual Schema
(c) MDBS Architecture without a Global Conceptual Schema

Q8(c) Describe Distributed Data Processing and Distributed Database System. **[4]**

EMP

EMPNO	ENAME	TITLE
E1	J. Doe	Elect. Eng.
E2	M. Smith	Syst. Analyst
E3	A. Lee	Mech. Eng.
E4	J. Miller	Programmer
E5	B. Casey	Syst. Analyst
E6	L. Chu	Elect. Eng.
E7	R. Davis	Mech. Eng.
E8	J. Jones	Syst. Analyst

ASG

ENO	PNO	RESP	DUR
E1	P1	Manager	12
E2	P1	Analyst	24
E2	P2	Analyst	6
E3	P3	Consultant	10
E3	P4	Engineer	48
E4	P2	Programmer	18
E5	P2	Manager	24
E6	P4	Manager	48
E7	P3	Engineer	36
E8	P3	Manager	40

PROJ

PNO	PNAME	BUDGET	LOC
P1	Instrumentation	150000	Montreal
P2	Database Develop.	135000	New York
P3	CAD/CAM	250000	New York
P4	Maintenance	310000	Paris

PAY

TITLE	SAL
Elect. Eng.	40000
Syst. Analyst	34000
Mech. Eng.	27000
Programmer	24000

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