First Term Examination
Fourth Semester [B.Tech.] Feb.-March-2017

Paper Code: ETCS-208   Sub: Database Management Systems
Time: 1 ½ Hours   Maximum Marks: 30

Note: Q. No. 1 is compulsory and attempt any two more questions from the remaining.

Q.1 (a) Differentiate between primary key, candidate key and super key.   (5x2)=10

(b) List two reasons why null values might be introduced into the database.

(c) Define the concept of aggregation in an E-R diagram. Give one example where this concept is useful.

(d) What is generalized projection? Explain with the help of an example.

(e) Explain how triggers are executed.

Q.2 (a) What is the difference between the terms 'relation' and 'relation schema'? Explain with an example.   (3)

(b) Consider a database used to record the marks that students get in different exams of different courses. Construct an E-R diagram that models exam as an entity and uses a ternary relationship for the above database. Clearly state the assumptions made if any.   (5)

(c) Does the relational model, as seen by an SQL query writer, provide physical and logical data independence? Explain   (2)

Q.3 (a) Explain Division operation in relational algebra. Given the following relations   (4)

A	
sno	pno
S1	P1
S1	P2
S1	P3
S1	P4
S2	P1
S2	P2

B1
pno
P2

B2
pno
P2
P4

Calculate   (1) $A \div B_1$ = sesa
              (2) $A \div B_2$

(b) Consider the following schema for an institute's library:
Student (<u>Roll No</u>, Name, Father – name, Branch)
Book (<u>ISBN</u>, Title, Author, Publisher)

[P.T.O]

Issue (Roll No., ISBN, Date- of issue)

Write the following queries either in relational algebra or SQL.

    (1) List roll no. and name of all students of the branch CSE.   (2)

    (2) Find the name of students who have issued a book published   (2)
      by 'ABC' publisher.

    (3) List title of all books issued on or before Jan 1, 2016.   (2)

Q.4 (a)   Let R=(A,B,C) and let r_1 and r_2 both be relations on schema R. Give   (2+1)
an expression in SQL that is equivalent to each of the following
queries:

    1. $\Pi_{AB}(r_1) \bowtie \Pi_{BC}(r_2)$

    2. $r_1 \cup r_2$

(b)   What is a stored procedure? Why it is useful? Give an example.   (3)

(c)   Differentiate between theta- join and equi-join   (2)

(d)   Explain the importance of defining views.   (2)

----------xxx----------

A3(b) ① select roll No, Name from student
where Branch = 'CSE';

or

$\pi_{RollNo, Name}$ $\sigma_{Branch = "CSE"}$ (Student)

② select Name
from Student, Book, Issue
where Publisher = 'ABC' and
Student.RollNo = Issue.RollNo and
Book.ISBN = Issue.ISBN;

or

π_{Name} $\sigma_{Publisher = "ABC"}$ (Student ⋈ Issue ⋈ Book)

③ select Title
from Book, Issue
where Date_of_Issue <= 'Jan1, 2016' and
Book.ISBN = Issue.ISBN

or

π_{Title} $\sigma_{Date\_of\_Issue <= "Jan1, 2016"}$ (Book ⋈ Issue)

A4(a) ① $\pi_{AB}(r_1)$ ⋈ $\pi_{BC}(r_2)$

select $r_1.A, r_1.B, r_2.B, r_2.C$
from r_1
inner join r_2 on
$r_1.B = r_2.B$

(2) select B from r_1
union
select B from r_2

First Term Examination

Fourth Semester [B.Tech.]-Jan-May 2016

Paper Code: ETCS-208   **Subject:** Database Management System

Time: 1:30Hrs.   **Maximum Marks:** 30

Note: Q. No. 1 is compulsory and attempt any two more questions from the remaining.

Q.No. 1 (a)   Differentiate between Procedural and Non-Procedural Query Language.
(b)   Define Lattice in ER- Diagram. *hierarchy is generalization, specialization*
(c)   Define the concept of Aggregation with an example.
(d)   How to represent weak entity set.
(e)   Define view with the help of example.

[2X5=10]

Q.No. 2   Given the relations

LOAN   BORROWER

Loan_No.	Branch_Name	Amount
L-170	ICICI	30,000
L-230	SBI	40,000
L-260	PNB	25,000

Cust_Name	Loan_No.
John	L-170
Smith	L-130
Adam	L-155

a) Give the relation obtained by Natural Join, Outer Join, Left Outer Join and Right Outer Join, Equi-Join and Theta-Join. (6)

b) Give the Relation Algebra for the following Query (4)
i) Find the Customer name having loan in ICICI branch. $\pi_{Cust\_name}(\sigma_{branch\_name = "ICICI"}(loan \bowtie borrower))$
ii) Find the Branch Name and Loan No. with the Loan Amount greater then 10,000.

$\pi_{BranchName, loanNo.}(\sigma_{amount > 10,000}(loan))$

Q.No. 3 a) Explain the Three Level Architecture of DBMS. (5)
b) What is a key? Explain Super Key, Primary Key and Foreign Key. (5)

Q. No.4 Explain the following.
a) Triggers (3)
b) Data Definition Language (3)
c) Set of Relations are
    USER_SCHEME(Card_No,B_Name, B_Addr)
    SUPPLIER_SCHEME(Acc_No.,S_Name,Price,DOS)
    BORROWER(Acc_No., Card_No., DOI)
Write the SQL Query for
i) Find out the name and address of borrowers who have issued a book on 2/feb/2016. (2)
ii) Find the name of the suppliers with maximum price. (2)

(i) select B_name, B_addr
from User_scheme and Borrower
where DOI = '2/feb/2016' and
Borrower.Card_No. = User_scheme.CardNo,

(ii) select S-name
from Supplier_Scheme
where price >= all (select price from supplier_scheme

First Term Examination

V Semester : [B.Tech]
Paper Code-ETCS-309
Time : 1hr 30 Min
Note-Q1 is compulsory. Attempt any two more questions from the rest.

Sept.,2011
Sub: DBMS
Max. Marks : 30

Q.1. (a) How DBMS provides users with a considerable degree of data independence?(2x5=10)

(b) Differentiate between a primary key and a super key.

(c) Define the following in terms of an E-R diagram :
   (i) Descriptive attributes *attributes of relationship set*
   (ii) Total participation

(d) Convert the following SQL query into an equivalent relational algebra expression:
   Select $A_1, A_2 ... A_n$
   From $r_1, r_2 .... r_m$

   $\pi_{A_1, A_2 - A_n} (r_1 \bowtie r_2 \bowtie - r_m)$

(e) Explain generalized projection. $\pi_{F_1, F_2 - F_n} (r)$
   arithmetic expression

Q.2. (a) Consider the following database and answer the following queries in relational algebra :
   (2+2+2)

   Teacher (Tname, street, city)
   Teach (Tname, schoolname, salary)
   School (School Name, City)

   (i) $\pi_{tname} (\sigma_{schoolname = "XYZ"} (School \bowtie Teach))$

   (i) Write name of all teachers who work for XYZ school.
   (ii) Find names, cities of all teachers, who work for ABC school.
   (iii) Find names of all teachers, who live in same city as the school in which they work.

(b) Differentiate between cartesian product and natural join operation. (4)
   $\times$ $\bowtie = \times + \sigma$

Q.3. (a) Differentiate between the terms relation and relation schema. (2)

(b) Design an E-R diagram for keeping track of the exploits of your favourite sports team. You should store the matches played, the scores in each match, the players in each match and individual player statistics for each match. Summary statistics should be modeled as derived attributes. (5)

(c) Let R = (A, B, C) and let r_1 and r_2 both be relations on schema R. Give an expression in SQL that is equivalent to each of the following queries : (1+2)
   (i) $r_1 \cap r_2$ select * from r_1 intersect select * from r_2
   (ii) $\pi_{A,B} (r_1) \bowtie \pi_{B,C} (r_2)$ select A, C, r_1.B from r_1, r_2
      where r_1.B = r_2.B

(ii) $\pi_{tname, city} (\sigma_{schoolname = "ABC"} (Teacher \bowtie Teach))$

(iii) $\pi_{tname} (Teacher \bowtie Teach \bowtie School)$

Q.4. (a) Explain the following joins :
  (i) Theta join
  (ii) Left Outer join ⋈   (2+2)

(b) Write down the following queries in SQL.   (6)

Suppliers (sno, sname, pincode, city)
Parts (pno, pname, color, weight)
Projects (projno, projname, city)
Shipments (sno, pno, projno)

(i) Get supplier name and city for suppliers who supply to any project with a 'red' colored part.

(ii) Get part name, color and project name supplied by supplier with sno 's1' to a project located in 'London'.

(iii) Get the project names which are supplied by supplier 'Manoj' with the part 'Bolt'.

(i) select sname, suppliers. city
from suppliers, shipments, parts, projects
where   suppliers.sno = shipments. sno
and   parts.pno = shipments.pno
and projects.projno = shipment.projno
  and color = 'red'

(ii) select pname, color, projname
from — — — — —
where suppliers. sno = shipments - sno
and _____
and _____
and sno = 's1'
and projects.city = 'London'

(iii) select projname — — —
from — —
where _____
and _____
and sname = 'Manoj' and pname = 'Bolt'

IVth Semester [B.Tech]
Paper Code: ETCS-208
Time: 1 Hr.

First-Term Examination

February-2015

Sub: Database Management System
Max. Marks: 30

Note: Attempt Q. 1 which is compulsory and any two more Questions from remaining.

Q.1 Fill in the blanks

(10)

a. RDBMS stands for.. *Relational DBMS*
b. DCL stands for.... *Data control language*
c. A special table to check any function in Oracle is...........
d. An association between two or more entities is... *relationship*
e. The command to eliminate a table from a database is *drop* .... table <table name>.
f. Database level is closest to the users is.... *view level*
g. A recursive relationship is a relationship between an entity and.. *same entity*
h. In a 1:N relationship, the foreign key is placed in. *Nth* . table.
i. A superclass/subclass hierarchy is one in which subclass has/have.. *one* . Superclass.
j. A. *superclass* Entity related to two or more associated entities that each contains specialized attributes that apply to some but not all of the instances of the entity.

Q. 2

a. Describe briefly with an example: derivedattribute, multivalued attribute, composite attributes, complex attribute, descriptiveattributes. (5)

b. What is Data Independence? Explain logical and physical data independence. (5)

Q. 3

a. Consider the two tables T1 (P, Q, R), T2 (S, T, U) as shown in fig 1. Show the results of the following (5)

Table T1		
P	Q	R
a	1	-
c	2	10
t	2	-
a	-	-

Table T2		
S	T	U
a	1	-
d	3	10
r	3	10
a	-	-

f₁ 1

i. $\sigma_{P=a}(T1)$
ii. $\Pi_{P, R}(T1)$
iii. $T1 \cup T2$
iv. $T1 \cap T2$
v. $T1 - T2$

b. Define the concept of aggregation. Give two examples of where this concept isuseful. (5)

Q. 4

employee(*employee-name, street, city*)
works(*employee-name, company-name, salary*)
company(*company-name, city*)
manages(*employee-name, manager-name*)

(5X2)

Consider the employee database and give an expression in SQL or Relational Algebra for each of the following queries

a. Find the names of all employees who work for SBI
b. Find the names and cities of residence of all employees who work for SBI
c. Find all employees in the database who do not work for SBI
d. Modify the database so that Hari now lives in Pune
e. Delete all tuples in the *works* relation for employees of SBI

A9 (a) select employee-name
      from employee, works,
      where company-name = 'SBI' and
      ~~employee.employee.name = works.employee.n~~

$\Pi_{employee-name} (\sigma_{company-name = "SBI"}) (\text{employee} \bowtie \text{works})$

(b) select employee name, city
      from employee, works
      where company-name = 'SBI' and
      employee.employee-name = works.employee-name

$\Pi_{employee-name, city} (\sigma_{company-name = "SBI"}) (\text{employee} \bowtie \text{works})$

(c) select employee-name
      from employee
      except
      select employee-name
      from employee, works
      where company-name = 'SBI' and
      ~~employee.employee-name = works.employee-name~~

$\Pi_{employee\_name}$ (employee) —

$\Pi_{employee\_name}$ ($\sigma_{company\_name = 'SBI'}$) ($\cancel{employee No}$ works)

(d) update employee
    set city = 'Pune'
    where employee_name = 'Hari'

  employee ⟵ $\Pi_{employee\_name, \; street,}$

city ($\cancel{\sigma_{employee-name = "Hari"}}$)

$\cancel{\leftarrow city = "Punge"}$

city ⟵ city = "Pune" ($\sigma_{employee\_name = "Hari"}$) (employee)

(e) delete from works
    where company_name = 'SBI'

  works ⟵ works — $\sigma_{company\_name = "SBI"}$ (works)