(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 1068 Roll No. | | | | | | | | | | |

B.Tech.

FOURTH SEMESTER EXAMINATION, 2005-2006

DATA BASE MANAGEMENT SYSTEM

Time : 3 Hours *Total Marks : 100*

Note : *(i) Attempt **ALL** questions.*

(ii) All questions carry equal marks.

(iii) In case of numerical problems assume data wherever not provided.

(iv) Be precise in your answer.

1. Attempt ***any four*** parts of the following : **(5x4=20)**

(a) Define the following terms :

(i) Data abstraction

(ii) Data independency

(iii) Database schema

(iv) Data redundancy

(v) DDL & DML

(b) Discuss the rule of the Data Base Administrator (DBA) in Data Base Management System.

(c) Explain three level architecture of DBMS in detail.

(d) Define the terms Generalization, Specialization and Aggregation with a suitable example

(e) Draw the E-R diagram of the registration process of the student in a particular course. Convert the E_R diagram into tables also.

2. Attempt *any four* parts of the following : **(5x4=20)**

(a) Consider the following three relation schema S, P and SP in which S# is supplier code, P# product code and Qty is Quantity and others carry their respective meanings.

S(S#, SNAME, SCITY, TURNOVER)

P(P#, WEIGHT, COLOR, COST, SELLING PRICE)

SP(S#, P#, QTY)

Write the appropriate SQL and relational algebra statements for the following queries.

(i) Get all details of supplier who operate from DELHI with TURNOVER = 80.

(ii) Get part nos. weighting between 25 and 35.

(iii) Get the names of suppliers whose name begins with A.

(iv) For each part supplied, get part no. and names of all cities supplying the part.

(v) Get the names of suppliers who supply part no. 2.

(b) A university has many departments. Each department may have many full-time and part-time students. Each department may float multiple courses for its own students. Each department has staff members who may be full-time or part-time. Design a generalization, specialization hierarchy for the university.

(c) Define the following terms :

(i) Integrity Constraints.

(ii) Foreign Key

(iii) Primary Key

(iv) Super Key.

(v) Candidate Key.

(d) Consider the following tables

P

A	B	C
a	b	c
b	c	a
c	a	b

Q

A	B	C
c	b	a
b	a	c
b	c	a

R

J
J_1
J_2
J_3

Perform the following relational algebra operations.

(i) $P \cup Q$

(ii) $P \cap Q$

(iii) P - Q and Q - P

(iv) P X R and Q X R

(e) What do you mean by View ? Discuss the advantages and disadvantages of View in detail.

3. Attempt *any two* parts of the following : **(10x2=20)**

(a) (i) Discuss the various anomalies associated with relational database management system by giving suitable examples.

(ii) Consider the following relational schema :

R (A, B, C, D, E, F, G, H) with the FDs

$AB \rightarrow C$, $BC \rightarrow D$, $E \rightarrow F$, $G \rightarrow F$, $H \rightarrow A$, $FG \rightarrow H$

Is the decomposition of R into R_1 (A, B, C, D), R_2 (A, B, C, E, F), R_3 (A, D, F, G, H) lossless ? Is it dependency preserving ?

(b) What is join dependency ? How is it different to that of Multivalued and Functional dependency ? Give an example each of join and multivalued dependency. Discuss the Fourth Normal Form (4NF) also in detail.

(c) What do you mean by Functional Dependency ? Explain BCNF with a suitable example. "A decomposition in BCNF may be lossless and dependency preserving". Is this statement correct ? Justify your answer with a suitable example.

4. Attempt *any two* parts of the following : **(10x2=20)**

(a) What is deadlock ? When does it occur ? How is it detected in data base system ? How can it be avoided ? Discuss in detail.

(b) What do you mean by Transaction system ? List the ACID properties of transaction. Discuss the recovery from transaction failures also.

(c) What do you mean by Serializability ? Discuss the Conflict and view serializability with suitable example. Discuss the testing of serializability also.

5. Attempt *any two* parts of the following : **(10x2=20)**

(a) What is multi-version schemes of Concurrency Control ? Describe with the help of an example. Discuss the various time stamping protocols for concurrency control also.

(b) What do you mean by Multiple Granularity ? Discuss with a suitable example. Discuss the validation based protocols also with a suitable example.

(c) What is two phase locking ? Describe with the help of an example. Will two phase locking result in deadlock ? Justify your answer with the help of an example. Discuss the Recovery with concurrent transactions also.

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