Printed Pages : 3 **CS-502**

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

PAPER ID : 1004 Roll No. | | | | | | | | | | |

B. Tech.

(SEM. V) EXAMINATION, 2007-08

DATABASE MANAGEMENT SYSTEMS

Time : 2 Hours] *[Total Marks : 50*

*Note : Attempt **all** the questions.*

1 Answer the following questions : 4×1=4

(a) Explain the overall database structure.

OR

(a) Draw a E-R diagram for a banking enterprise. Clearly stating the assumption made.

(b) Define the following : (any **five**) 5×2=10

(i) Data Models

(ii) Transaction Management

(iii) Candidate key

(iv) Primary key

(v) Super key

(vi) Generalization

(vii) Aggregation.

2 Answer any **two** of the following : 6

(a) Consider the employee database given below.
employee (employee name, street, city)
works (employee, name, company-name, salary)

company (company_name, city)
manager (employee_name, manager_name)
Give an expression in tuple and domain relational calculus.

(i) Find the names of all employees who work for First Bank Cooperation.

(ii) Find all employees in the database who live in the same city as the companies they work for.

(iii) Find all employees in the database who live in cities and on same streets as do their managers.

(b) Let the following relation schemes be given : 6
R = (A,B,C); S = (D, E, F) let relations r(R) and s(S) be given. Give an expression in SQL that is equivalent to each of the following :

(i) $\pi_A(r)$ (ii) $\sigma_{B=17}(r)$ (iii) $r \times s$

(c) Explain referential integrity, assertions and triggers. 6

3 Answer any **two** of the followings :

(a) Compute the closure of the following set F of functional dependencies for relation schema 6
R = (A,B,C,D,E)
A → BC, CD → E, B → D, E → A

(b) Let R (A,B,C,D,E) and let M be the following set of multivalued dependencies : 6
A →→ BC, B →→ CD, E →→ AD
List the nontrivial dependencies in M^+

(c) Explain : 6

(i) Multivalued dependency

(ii) Third Normal Form.

Answer any **two** of the followings :

(a) Consider the following transactions : 6

T_{31}: read (A);
read (B);
if (A=0) then B = B+1;
write (B);
T_{32}: read (B);
read (A);
if B = 0 then A = A+1;
write (A);

Add lock and unlock instructions to transactions T_{31} and T_{32}, so that they observe the two-phase locking protocol. Can the execution of these transactions results in a deadlock ?

(b) What benefit is provided by strict two phase locking? What disadvantages result? 6

(c) Explain the ACID properties of a transaction. 6