CE- Sem-IV – Computers 21/5/15

DMS

(OLD COURSE) **QP Code : 4049**

3Hrs. **100 Marks**

N.B.: (1) Question No.1 is Compulsory.
(2) Out of remaining six questions attempt any Four questions.
(3) In all five questions to be attempted.
(4) All questions carry equal marks.
(5) Answer to each new question to be started on fresh page.

1a	Consider a AIRLINE Reservation System **a) Draw ER diagram .Assume Suitable** **b) Convert the ER diagram into equivalent schema**	**10**
1b	**Explain the following terms with example** (i) Strong Entity Set (ii) Project operator in relational algebra (iii) Primary Key (iv) Left outer join (v) TCL	**10**
2a	***employee*** **(*employee-name*, *street*, *city*)** ***works*** **(*employee-name*, *company-name*, *salary*)** ***company*** **(*company-name*, *city*)** ***manages*** **(*employee-name*, *manager-name*)** **a)** Create relations employee and works **b)** Add a new employee to the database; assume any values for required attributes. **c)** Delete the works details for the employee "Sachin Parkar". **d)** Find all employees in the database who do not work for State Bank of India **e)** Find the company that has the most employees.	**10**
2b	Explain the 3-Tier ANSI-SPARC architecture	**10**
3a	***employee*** **(*person-name*, *street*, *city*)** ***works*** **(*person-name*, *company-name*, *salary*)** ***company*** **(*company-name*, *city*)** ***manages*** **(*person-name*, *manager-name*)** **Solve the following Queries using relational algebra:** i. Modify the database so that "Sachin" now lives in "Agra" ii. Find the names, street address, and cities of residence of all employees who work for ICICI and earn more than Rs10,000 per month iii. Find the company with the smallest payroll iv. Find the names of all employees in this database who do not work for ICICI Bank v. Find the company name which is in Mumbai	**10**

3b	Explain View Serializability with example	**10**
4a	i. Compute the closure of the following set F of functional dependencies for relation schema $R = (A, B, C, D, E)$. $A \rightarrow BC$ $CD \rightarrow E$ $B \rightarrow D$ $E \rightarrow A$ List the candidate keys for R ii. Explain Third Normal Form and BCNF with example	**5** **5**
4b	Explain B+ tree with examples of various operation(insertion,deletion)	**10**
5a	Explain timestamp ordering protocol	**10**

5b	Consider the following two transactions:
	$T31$: read(A);
	read(B);
	if $A = 0$**then** $B := B + 1$;
	write(B).
	$T32$: read(B);
	read(A);
	if $B = 0$**then** $A := A + 1$;
	write(A).
	Add lock and unlock instructions to transactions $T31$ and $T32$, so that they observe the two-phase locking protocol. Can the execution of these transactions result in a deadlock?
		10

6a	Explain Immediate database modification technique for log based recovery	**10**
6b	Explain what is deadlock and methods for deadlock detection	**10**
7	**Write short notes for: (Any four)** i. Referential Integrity ii. Aggregate functions in SQL iii. Shadow Paging iv. Checkpoints v. Triggers in SQL	**20**