Total No. of Questions—**5**] [Total No. of Printed Pages—**4**

Seat No.	

[4966]-4003

M.C.A. (Com. Faculty) (Fourth Semester) EXAMINATION, 2016

403 : DISTRIBUTED DATABASE SYSTEM

(CREDIT SYSTEM)

(2013 PATTERN)

Time : Three Hours **Maximum Marks : 50**

N.B. **:—** (*i*) *All* questions are compulsory.

(*ii*) Neat diagrams must be drawn wherever necessary.

(*iii*) Figures to the right side indicate full marks.

1. Attempt any *seven* : [7×2=14]

(*a*) State the 3-dimensions based on which the architectural models for a DDB is defined.

(*b*) Define transparency in DDBS. State the types of transparencies.

(*c*) A relation is most appropriate unit of fragmentation. Comment.

(*d*) Define the following :

(*i*) Dirty read

(*ii*) Non-repeatable read.

(*e*) Define fault. State different types of faults.

(*f*) State *four* different alternatives for implementing LRM algorithms.

(*g*) State different steps in query decomposition.

(*h*) State correctness rules of fragmentation.

P.T.O.

2. Attempt any *theee* : [3×4=12]

(*a*) Define allocation problem. Give the information requirement for the same.

(*b*) Explain different components of a DDBMS.

(*c*) Explain failures DDBMS.

(*d*) Explain layers of query processing.

3. Attempt any *theee* : [3×4=12]

(*a*) What is a workflow ? Expalin the different types of workflows.

(*b*) Explain two-phase locking protocol.

(*c*) Explain features of distributed *Vs.* centralized databases.

(*d*) Write short notes on the following :

(*i*) Hierarchical deadlock detection

(*ii*) Distributed deadlock detection.

4. Attempt any *theee* : [3×4=12]

(*a*) Let $a = \{a_1, a_2, q_3\}$ be set of queries, $A = \{A_1, A_2, A_3\}$ be st of attributes & $S = \{S_1, S_2\}$ be a set of sites. The matrix (*i*) describes the attributes usage values and the matrix (*ii*) gives application access frequency.

Assume that reFi(*qk*) = 1 for all *qk* at Si. Use bond energy algorithm and vertical partitioning algorithm to obtain vertical fragmentation of set of attributes in A.

	A_1	A_2	A_3
q_1	1	1	0
q_2	1	0	0
q_3	0	1	1

(*i*)

	S_1	S_2
q_1	12	0
q_2	20	20
q_3	0	30

(*b*) Draw the query graph for the following query and check whether the query is semantically correct :

Selct ename, pname

From emp, asg, proj

Where asg. dur <24

and emp. eno = asg. eno

and emp.title = 'Manager'

and asg. pno = proj. pno

(*c*) Consider the following query and transform it into optimized operator tree using the restrucuning algorithm.

select pay.sal, emp.ename

from emp, proj, asg, pay

where emp.eno = asg. eno

and emp.title = pay.title

and asg.pno = proj.pno

and (proj.budget > 250000 or asg.dur <24)

(*d*) Draw an operator tree for the following query :

select emp.name

from emp,dept

wehre emp. sex = 'Male'

and dept. budget > 400000

and emp.dno = dept.dno

The dept relation is fragmented horizontally as,

dept 1 = σ_{budget} < 400,00 (dept)

dept 2 = σ_{budget} > = 400,000 (dept)

The emp relation is fragmented using derived horizontal fragmentation as :

emp1 = emp $\propto$ dept1

emp 2 = emp $\propto$ dept2

Convert the operator tree to generic tree and then reduce it.