



Name :

Roll No. :

Invigilator's Signature :

**CS/M.Tech(CSE)/SEM-1/CSEM-103/2009-10
2009**

ADVANCED DATABASE MANAGEMENT SYSTEMS

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

Answer any *five* of the following. $5 \times 14 = 70$

1. a) Explain with diagram the reference architecture of a DDBMS. 5
- b) What is fragmentatoin ? Discuss the different types of fragmentation with example. 9
2. a) Describe different steps of SDD-I algorithm with assumption for query optimization. 6



- b) Consider the following query and solve it by applying SDD-I algorithm to find the final site for join and query execution strategy. 8

Select $R_3.C$ from R_1, R_2, R_3 where $R_1.A = R_2.A$ and $R_2.B = R_3.B$. DBMS statistics are as follows :

Relation	Cardinality	Tuple size	Relation size
R_1	30	50	1500
R_2	100	30	3000
R_3	50	40	2000

Attribute	SF_{SJ}	Size ($\prod_{attribute}$)
$R_1.A$	0.3	36
$R_2.A$	0.8	320
$R_2.B$	1.0	400
$R_3.B$	0.4	80

3. a) How is deadlock detected in DDBMS ? 3
- b) Explain 2-phase commitment protocol. 7
- c) Explain timestamp protocol. 4
4. Write short notes on any *four* of the following : $4 \times 3\frac{1}{2}$
- a) Fragmentation transparency
- b) Distributed serializability
- c) Majority locking protocol
- d) Steps of query decomposition
- e) Database replication.



5. Compare OLAP and OLTP. Define and discuss Data warehousing. What are the components of Data Warehouse ?

5 + 4 + 5

6. Explain the role of Fact Table and Dimension Table in OLAP. Define Data Mart. State about various types of Data Marts.

6 + 3 + 5

7. Discuss any three Data Mining Algorithms. State various steps of Data Mining.

7 + 7

8. Explain the "Speedup and Scaleup" technique for parallel database machine implementation. Design a Temporal Data Model by considering the time-varying nature of data.

7 + 7

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