

C6-R3: ADVANCED DATABASE MANAGEMENT SYSTEMS

NOTE:

1. Answer question 1 and any FOUR questions from 2 to 7.
2. Parts of the same question should be answered together and in the same sequence.

Time: 3 Hours

Total Marks: 100

1.
 - a) How does Tuple-oriented relational calculus differ from domain-oriented relational calculus?
 - b) Define multivalued dependency (MVD). How is multivalued dependency concept useful in Normalization? How is it related to 4NF?
 - c) Explain, how statistics allow to estimate the sizes and costs of executing the operations in querying optimization.
 - d) What are the advantages of a distributed database management system over a centralized DBMS?
 - e) What are cursors? List different types of cursors.
 - f) What is database Trigger? Name and explain two utilities of Oracle, which are useful for back up and recovery.
 - g) OODB and ORDB are two database systems. Which of them are considered to provide better protection and inheritance? Justify which one of them has superior performance.

(7x4)

2.
 - a) A B C is a set of attributes. The functional dependency is as follows
AB → B
AC → C
C → B
What is the normal form for the above? Give reasons.
 - b) How does the concept of an object in the object-oriented model differ from the concept of an entity in the entity-relationship model?
 - c) Explain, what are commit protocols for distributed databases.
 - d) Explain in brief about Multimedia databases. Where are multimedia databases used in applications?

(5+5+4+4)

3.
 - a) Explain overall process of program preparation and execution in DB2. Explain major components of DB2 in brief.
 - b) When is a functional dependency F said to be minimal?
 - c) What is phantom deadlock in distributed database system?
 - d) What are foreign key constraints? Why such constraints are important? What is referential integrity?

(5+4+3+6)

4.
 - a) What are the important exponents of a client/server application?
 - b) What do you mean by Multi database system in the context of distributed DBMS? Explain in brief.
 - c) What are the salient features of ROLAP and MOLAP servers?
 - d) Can it be possible to mine directly from database? Why do you require separate warehouses?

(5+5+4+4)

5.

a) Differentiate between homogeneous distributed database management systems and heterogeneous distributed database management systems.

b) Consider the following employee database:

employee (person-name, street, city)

works (person-name, company-name, salary)

company (company-name, city)

manages (person-name, manager-name)

Give expressions in datalog for each of the following queries.

i) To find all employees who work (directly or indirectly) under the manager "Jones".

ii) To find all cities of residence of all employees who work (directly or indirectly) under the manager "Smith".

c) Which are the three commonly used partitioning techniques for parallel databases? Explain in brief.

d) What are database log files? What is the minimum number of log file should a database have?

(4+4+6+4)

6.

a) What are the key properties of long duration transactions? How do concurrency protocols affect long duration transactions?

b) Explain the concept of the object identity and reference in object relational database.

c) Differentiate between OLTP and OLAP with respect to various parameters.

d) Do main memory databases provide more opportunities for optimization? Elaborate.

(8+4+3+3)

7.

a) What is the content of XML documents? What is specified by Document type Declaration (DTD)?

b) What do you mean by Correlated subquery? What do you mean by recursive queries?

c) What is transaction workflow? How can it be specified?

d) Differentiate between clustering and classification.

(6+5+3+4)