MCS-043

MASTER OF COMPUTER APPLICATIONS (MCA)

Term-End Examination

June, 2022

MCS-043 : ADVANCED DATABASE MANAGEMENT SYSTEM

Time : 3 Hours　　　　*Maximum Marks : 100*

Note : *Question **No. 1** is compulsory. Attempt any **three** questions from the rest.*

1. (a) Explain the concept of multivalued dependency with the help of an example. 5

   (b) With the help of a diagram, explain the steps involved in the query processing. 5

   (c) How can a deadlock be detected using a wait-for graph ? Explain with the help of an example. 5

(d) Define Object Definition Language (ODL). How an object model is represented using ODL ? Explain with the help of an example.   5

(e) Discuss the basic characteristics of the following DBMS architectures : $2\frac{1}{2}$ each

   (i)   Geographic Information System

   (ii) Web Databases

   (iii) Mobile Databases

   (iv) Multimedia Databases

(f) For a relation R (A, B, C, D, E, H) having the set of functional dependencies :   5

   F = {A → BC, CD → E, E → C,

       D → AEH, ABH → BD, DH → BC}

Find the key for the relation R.

(g) Discuss various steps to knowledge discovery process using suitable diagram. 5

2. (a) Explain the role of Control files and Redo log files in ORACLE DBMS.   5

   (b) Explain different types of indexes supported in PostgreSQL.   5

(c) Consider a relational schema R (A, B, C, D, E, F, G) and a set of functional dependencies F = {A → ABCDEFG, CE → A, BD → E, C → B}. Give a lossless join, dependency preserving 3NF decomposition of R. 10

3. (a) Explain the following : 5

(i) System Catalogue and its contents

(ii) Triggers in PL/SQL

(b) Discuss audit trials in DBMS. 5

(c) What are basic steps involved in creation of a view ? Explain with the help of an example. 5

(d) How does the architecture of DDBMS differ from centralized DBMS ? 5

4. (a) What is time stamp ? How do time-stamp-based protocols for concurrency control differ from locking-based protocol ? 5

(b) What are ACID properties ? Explain their significance in transaction management. 5

(c)   Explain Apriori algorithm using a suitable example.   5

(d)   With the help of an example, explain the star schema in the context of multi-dimensional modelling.   5

5.   Explain any *four* of the following with the help of an example/diagram, if needed :   5 each

(a)   Embedded SQL

(b)   Query Evaluation Plan

(c)   Remote Backup Systems

(d)   XML Document

(e)   Gnome Databases