

MCA
(SEM II) THEORY EXAMINATION 2022-23
DATABASE MANAGEMENT SYSTEMS

Time: 3 Hours

Total Marks: 100

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt all questions in brief. 2 x 10 = 20

- (a) Define the terms Data and Database.
- (b) Discuss various advantages of DBMS?
- (c) Define cursor in PL/SQL.
- (d) What do you mean by sub-queries?
- (e) Why normalization is used?
- (f) What is pseudo-transitivity?
- (g) Define serializable schedule.
- (h) What do you mean by transaction failure?
- (i) Define concurrent processing in database.
- (j) What do you mean by dispatcher in terms of Oracle?

SECTION B

2. Attempt any three of the following: 10 x 3 = 30

- (a) Discuss ANSI/SPARC architecture in detail.
- (b) Create a table Employee(Emp_id, Emp_name, Emp_add, Emp_basicpay) and insert some records in it. Create another table Emp_detail(Emp_name, Emp_add) from Employee table by using SELECT statement.
- (c) Explain basic inference rules applied on the set of functional dependencies. Suppose R with attributes A, B, C, D, E, F have the FDs $A \rightarrow BC$, $B \rightarrow E$, $CD \rightarrow EF$. Prove that FD : $AD \rightarrow F$ also holds in R.
- (d) Write short note on Testing of serializability.
- (e) What are various types of Locks applied on data items? Discuss Two-phase locking protocol and Strict Two-phase locking protocols.

SECTION C

3. Attempt any one part of the following: 10 x 1 = 10

- (a) Discuss various types of Entity, Attribute and Relation used in designing an ER-diagram.
- (b) What are various types of databases? Discuss them.

4. Attempt any one part of the following: 10 x 1 = 10

- (a) Create the tables Supplier(SNo, SName, City), Parts(PNo, Pname, Color, City), and Shipment(SNo, PNo, Quantity). Answer the following queries :
 - (i) Get the total number of suppliers.
 - (ii) Get the total number of suppliers currently supplying parts.
 - (iii) Get part numbers of all parts supplied.
 - (iv) Change the color of parts from red to black.
- (b) Discuss Primary Key, Unique Key, Candidate Key and Foreign Key by taking examples.

5. Attempt any *one* part of the following: **10 x 1 = 10**

- (a) Given a relation R(P, Q, R, S, T) and Functional Dependency set $FD = \{ PQ \rightarrow R, S \rightarrow T \}$, determine whether the given R is in 2NF? If not convert it into 2 NF.
- (b) How will you check that the decomposition of a relation on a given set of functional dependencies is dependency preserving? Discuss with the help of an example.

6. Attempt any *one* part of the following: **10 x 1 = 10**

- (a) Explain ACID properties of a transaction in detail.
- (b) Write short note on Log-Based Recovery.

7. Attempt any *one* part of the following: **10 x 1 = 10**

- (a) What is Timestamp Ordering Protocol? Discuss working of Basic Timestamp ordering protocol along with advantages and disadvantages of it.
- (b) Write short note on Multiple Granularity.