



Tribhuvan University
Faculty of Humanities & Social Sciences
OFFICE OF THE DEAN
2024

Master in Computer Applications
Course Title: Advanced Database Management System
Code No: MCA 503
Semester: I

Full Marks: 60
Pass Marks: 24
Time: 3 hours
Batch: 2023

Candidates are required to answer the questions in their own words as far as possible.

Group A

Attempt any SIX questions

[6x5=30]

1. What is object database design? Differentiate between conceptual design of ODB and RDB design. [1+4]
2. Explain HDFS and map reduce programming model. [5]
3. Describe distributed database query processing steps in detail. [5]
4. State CAP theorem. Explain the categories of NoSQL systems. [1+4]
5. Define sharding. Explain 2PC and 3PC in brief. [1+4]
6. Define materialization. Explain demand driven and producer driven evaluation in detail. [1+4]
7. What is the difference between persistent and transient objects? How is persistence handled in OO database system? [2.5+2.5]

Group B

Attempt any THREE questions

[3x10=30]

8. Why SQL queries are converted into relational algebra queries before optimization is done? Discuss semi-join and anti-join as operators to which nested queries may be mapped with suitable example. [5+5]
9. What are the differences and similarities between object and literals in ODMG object model? Explain the process of mapping EER schema to ODB schema. [5+5]
10. Describe ECA model with suitable example. What are the types of updates that can be performed in temporal database? Explain the models of spatial information. [3+4+3]
11. What are the main CRUD operations of MongoDB? Explain data modeling concepts used in MongoDB. Discuss how replication and sharding are done in MongoDB. [3+4+3]