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DWIT College

Tribhuvan University
Institute of Science and Technology

2072

Bachelor Level/ First Year/ First Semester/ Science — Full Marks: 60
Computer Science and Information Technology (CSc. 253) — Pass Marks: 24
(Database Management System)

Candidates are required to give their answers in their own words as for as practicable.
The figures in the margin indicate full marks.

Attemp All Questions

1. Answer the following questions in short: (5 x 2)

   a. Three Schema Architecture
   b. Advantages of DBMS approach over file system approach.
   c. What is weak entity, owner entity type and identifying relationship?
   d. Different types of data attributes.
   e. Differentiate between program – data independence and program operation independence.

2.
   a) Give ER diagram for a database showing Bank. Each Bank can have multiple Branches and each bank can have multiple accounts and loan.
   b) What is union compatibility? Define operation union, Intersection, and difference on two union compatible relation R and S with suitable example.

3.
   a) Describe the different clauses in the syntax of an SQL query, and show what constructs can be specified in each clause.
   b) How view is defined to SQL? Explain the problems that may arise when one attempts to update a view.

4.
   a) Define Boyce – Codd normal form. How does it differ from 3NF? Why is it considered stronger of 3 NF?
   b) What is a functional dependency? When are two sets of functional dependency equivalent? How we determine their equivalence?

5.
   a) Discuss the ACID properties of a database transaction with suitable example.
   b) Indicate how the recovery scheme works in a single user environment if the system fails.
      a. After the transaction starts before the read.
      b. After the read and before the write.
      c. After the write and before the comment.
      d. After the commit and before al database entries are flushed onto disk.

6.

a) What is the two-phase locking protocol? How does it guarantee serializability?
b) What is meant by transaction rollback? What is meant by cascading rollback? Why do practical recovery methods use protocols that do not permit cascading rollback?