

Tribhuvan University
Institute of Science and Technology
2070
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Bachelor Level/ Second Year/ Fourth Semester/ Science
Computer Science and Information Technology (CSc. 253)
(Database Management System)

Full Marks: 60
Pass Marks: 24
Time: 3 hours.

Attempt all the questions.

1. (a) What is database management system? Discuss the advantages of using database management system over file system. (2+3 =5)
(b) What is data abstraction? Discuss three levels of this abstraction. (1+4=5)
2. a) Construct an ERD to record the marks that students get in different exams of different course offerings. (5)
b) Define integrity constraint? Discuss domain constraint with suitable example. (1+4=5)
3. a) With the information given below, calculate any three members of F^* . (6)
 $R = (A, B, C, G, H, I)$
 $F = \{A \rightarrow B, A \rightarrow C, CG \rightarrow I, B \rightarrow H\}$
b) Discuss 2NF and 3NF with suitable example. (4)
4. Consider the following supplier database, where primary keys are underlined: (20)
Supplier (supplier-id, supplier-name, city)
Supplies (supplier-id, part-id, quantity)
Parts (part-id, part-name, color, weight)
Construct the following relational algebra queries for this relational database
a) Find the name of all supplies located in city "Kathmandu".
b) Find the name of all parts supplied "ABC Company".
c) Find the name of all parts that are supplied in quantity greater than 300.
d) Find the number of parts supplied by "ABC Company".
e) Find the name of all suppliers who supply more than 30 different parts.
5. a) What is serializable schedule? How can you test a schedule for conflict serializability?. (2+3=5)
b) Discuss recovery technique based on deferred update with concurrent execution in multi-user environment. (5)