Dr Yashwal

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- September 2016

B.Tech III Semester

COURSE CODE: 10B11CI312 MAX. MARKS: 15

COURSE NAME: Database Systems

COURSE CREDITS: 4 MAX. TIME: 1Hr

Note: *All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

Q1. Consider the following relational schema for a library:

member(*membno*, *name*, *dob*)
books(*isbn*, *title*, *authors*, *publisher*)
borrowed(*membno*, *isbn*, *date*)
Write the following queries in relational algebra.

a. Find the names of members who have borrowed any book published by "McGraw-Hill".
b. Find the name of members who have borrowed all books published by "McGraw-Hill".
c. Find the name and membership number of members who have borrowed more than five different books published by "McGraw-Hill".
d. For each publisher, find the name and membership number of members who have borrowed more than five books of that publisher.
e. Find the average number of books borrowed per member. Take into account that if a member does not borrow any book, then that member does not appear in the *borrowed* relation at all.

[5]

Q2. Design an Entity Relationship (ER) model for college. A college contains many departments. Each department can offer any number of courses. Many instructors can work in a department. An instructor can work only in one department. For each department there is a Head. An instructor can be head of only one department. Each instructor can take any number of courses. A course can be taken by only one instructor. A student can enroll for any number of courses. Each course can have any number of students
Your design should include an E-R diagram, a set of relational schemas, and a list of constraints, including primary-key and foreign-key constraints.

[5]

Q3.
(a) With suitable example, show the distinction between disjoint and overlapping constraints and total and partial constraints in specialization and generalization.
(b) Database system has three level of data abstraction, illustrate with suitable example.
(c) Database Administrator (DBA) is the key person in database Management Systems; List the various roles of DBA.
(d) Differentiate between physical data independence and logical level independence.
(e) What is a referential integrity? Explain with an example. [5]