

CSCE 520 – Spring 2007
Midterm Examination
March 8, 2007

Name: _____

There are a total of 6 questions and 50 points on this examination. Points for each question are shown beside the question. If you think a question is ambiguous, make and state a reasonable assumption. The exam is closed book and closed notes. The use of calculators and similar-looking electronic devices is not allowed. Show your work for possible partial credit. Answer all questions on this exam paper.

1. (8) Briefly define each of the following terms in the context of this course.

a. composite key

b. referential integrity

c. join

d. physical data model

2. (2) Specify the cardinality of each of the following relationships:

a. Students – Courses

b. Managers – Departments

3. (4) What is the difference between a database system and a database management system? Give one example of each. Do not use Supplier-Parts as the database example.

4. (6) Identify the appropriate normal forms for each of the following relations. If the relation is not already in 3NF, convert it into 3NF relations.

a. R1 (A, B, C) Functional dependencies: $A \rightarrow B$; $B \rightarrow C$

b. R2 (W, X, Y, Z) No functional dependencies

c. R3 (I, J, K, L) Functional dependencies: $KL \rightarrow I$; $L \rightarrow J$

5. Consider the description of the Woodlands Nature Center on the last page.

a. (10) Draw an ER diagram showing the entities and their relationships described in this paragraph. Be sure to indicate the cardinality of the relationships and the primary keys.

b. (10) Provide 3NF relations to convert this ER diagram into a relational database.

6. (10) Write SQL queries for the Supplier-Parts Database to accomplish the following tasks. A copy of the database is shown on the last page.

a. Determine the minimum weight for a part.

b. Retrieve part numbers and names for red parts with weight less than 15.

c. Retrieve supplier names and numbers for all suppliers. Put the list in alphabetical order by supplier name.

d. Retrieve part numbers and names for all parts which are either red or blue.

e. Retrieve the supplier numbers for suppliers with current shipments. Eliminate duplicates.

This page may be used as scratch paper or for an additional page if you need one. It does not need to be turned in unless there is something on it you want graded.

This page contains information needed to answer Questions 5 and 6. You may tear it off. You do not need to turn it in unless there is something on it you want graded.

The Woodlands Nature Center

The Woodlands Nature Center is a small nature center that offers programs and field trips. In addition, it has a book store and a collection of animals. The schedule of programs shows title, leader, and date; attendance records showing the number of attendees are maintained for these programs. Much the same information is kept for field trips, except that destination is specified rather than title. The book store sells (surprise!) books; each is identified by title, author(s), publisher, date, and price. The quantity-on-hand of each book is also kept. (You do not need to include sales information for the books.) Records are also kept for volunteers, showing their volunteer activities, phone numbers, emails, and names. (You may assume each volunteer has only one phone number and one email address.)

Date's Famous Supplier-Parts Database