Computer Science 455

Third Hour Exam

Name _____

The supplier-parts-projects (SPJ) database:

s(sno, sname, status, city)
p(pno, pname, color, weight, city)
j(jno, jname, city)
spj(sno, pno, jno, qty)

Wednesday, April 27, 2005
100 pts.

I.   Bottom-up design:

        a.   (15 pts.)   List and briefly describe the steps taken for each form or exhibit in a bottom-up design..

b.   (15 pts.)   Consider the form printed as the last page of this exam (the page may be removed if you write nothing on it that you want me to see), a customer record for a veterinary's . Construct a relational schema from the information on the and an entity-relationship diagram. You do not need to go through the systematic steps you described in part (a). Simply identify reasonable entities, attributes, and relations (writing them into a relational schema and an entity-relationship diagram).

II.   Some more SQL (all queries are with respect to the SPJ database on the front
       cover)

       a.   (5 pts.) Using MINUS, write a query which will return the supplier
             numbers of suppliers who supply no LONDON projects.

       b.   (5 pts.) Re-write the query of part (a) above using NOT EXISTS

c. (10 pts.) Write a query which will produce, for each supplier number, the total number of parts supplied by that supplier (sum over the **qty** field).

d. (5 pts.) Revise the query of part (c) above so that we list only supplier numbers who supply more than 1,000 parts.

e.   (5 pts.) SQL is primarily a relational calculus query language, but has
        some elements of the relational algebra. Give three SQL relational algebra
        operators.

f.   (15 pts.)   Find the names of parts used on every LONDON project
        (i.e., the names of parts for which there does not exist a London project
        which is not supplied with this part).

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g.   (5 pts.) Find the supplier numbers of suppliers who supply a part also
        supplied by supplier S1.

III.   Miscellaneous questions:

a.   (5 pts.) Briefly describe how COMMIT and ROLLBACK can be used to maintain the integrity of a transaction.

b.   (5 pts.) What is a trigger on a form (for example, associated with a button)?

c.   (10 pts.)   What is the impedance mis-match problem? How does PL/SQL resolve it?