Name: _____       ID#: _____

**Question 1:**                                                  (**5 Points**)

Consider the following relations:

| EMPLOYEE | FNAME | MINIT | LNAME | SSN | BDATE | ADDRESS | SEX | SALARY | SUPERSSN | DNO |
|---|---|---|---|---|---|---|---|---|---|---|
| | John | | Smith | 123456789 | 1965-01-09 | 731 Fondren, Houston, TX | M | 30000 | 333445555 | 5 |
| | Franklin | | Wong | 333445555 | 1955-12-08 | 638 Voss, Houston, TX | M | 40000 | 888665555 | 5 |
| | Alicia | | Zelaya | 999887777 | 1968-01-19 | 3321 Castle, Spring, TX | F | 25000 | 987654321 | 4 |
| | Jennifer | | Wallace | 987654321 | 1941-06-20 | 291 Berry, Bellaire, TX | F | 43000 | 888665555 | 4 |
| | Ramesh | | Narayan | 666884444 | 1962-09-15 | 975 Fire Oak, Humble, TX | M | 38000 | 333445555 | 5 |
| | Joyce | | English | 453453453 | 1972-07-31 | 5631 Rice, Houston, TX | F | 25000 | 333445555 | 5 |
| | Ahmad | | Jabbar | 987987987 | 1969-03-29 | 980 Dallas, Houston, TX | M | 25000 | 987654321 | 4 |
| | James | | Borg | 888665555 | 1937-11-10 | 450 Stone, Houston, TX | M | 55000 | null | 1 |

| WORKS_ON | ESSN | PNO | HOURS |
|---|---|---|---|
| | 123456789 | 1 | 32.5 |
| | 123456789 | 2 | 7.5 |
| | 666884444 | 3 | 40.0 |
| | 453453453 | 1 | 20.0 |
| | 453453453 | 2 | 20.0 |
| | 333445555 | 2 | 10.0 |
| | 333445555 | 3 | 10.0 |
| | 333445555 | 10 | 10.0 |
| | 333445555 | 20 | 10.0 |
| | 999887777 | 30 | 30.0 |
| | 999887777 | 10 | 10.0 |
| | 987987987 | 10 | 35.0 |
| | 987987987 | 30 | 5.0 |
| | 987654321 | 30 | 20.0 |
| | 987654321 | 20 | 15.0 |
| | 888665555 | 20 | null |

| PROJECT | PNAME | PNUMBER | PLOCATION | DNUM |
|---|---|---|---|---|
| | ProductX | 1 | Bellaire | 5 |
| | ProductY | 2 | Sugarland | 5 |
| | ProductZ | 3 | Houston | 5 |
| | Computerization | 10 | Stafford | 4 |
| | Reorganization | 20 | Houston | 1 |
| | Newbenefits | 30 | Stafford | 4 |

i) Write a Tuple-Relational Calculus expression to list SSN of and project number for every employee who works on any project more than 20 hours a week.     (**1 Point**)

ii) Write a Tuple-Relational Calculus expression to list the last name, the project number and number of hours of every employee who works in department # 4.     (**2 Point**)

iii) Write a Domain-Relational Calculus expression to list SSN, the project number and number of hours of the employee 'John Smith'.     (**2 Point**)

**Question 2:** (**5 Points**)

Using the relations given in Question 1, write appropriate SQL commands for the following parts:

a) Create the table WORKS_ON in the COMPANY database. Make reasonable assumptions about the attribute names. (**2.5 Point**)

b) Assuming that the table PROJECT was already created insert into PROJECT the tuple < 'ProductA', 4, 'Austin', 1>. (**1 Point**)

c) For Project 'ProductX', change its location to 'Austin'. (**1.5 Point**)