Domain Relational Calculus

Find the names of pizzas that come in a 10 inch size

$\{<N> \mid \exists C\ \exists S\ (pizza(C, N, S) \wedge S = 10)\}$

Find the names of pizzas that come in a 10 inch or a 12 inch size

$\{<N> \mid \exists C\ \exists S\ (pizza(C, N, S) \wedge (S = 10 \vee S = 12))\}$

Find the names of pizzas that come in both a 10 inch and a 12 inch size

$\{<N1> \mid \exists C1\ \exists S1\ \exists C2\ \exists N2\ \exists S2$
$(pizza(C1, N1, S1) \wedge pizza(C2, N2, S2) \wedge N1 = N2 \wedge S1 = 10 \wedge S2 = 12)\}$

Find the pairs of different codes of pizzas with the same name and the same size (is there any?)

$\{<C1, C2> \mid \exists N1\ \exists S1\ \exists N2\ \exists S2$
$(pizza(C1, N1, S1) \wedge pizza(N2, C2, S2) \wedge C1 <> C2 \wedge N1 = N2 \wedge S1 = S2)\}$

Find the names and phone numbers of the stores in "College Park" or "Greenbelt" that sell a 10 inch pizza named "pepperoni" for less than $8

$\{<SN, P> \mid \exists C\ \exists N\ \exists S\ \exists A\ \exists Pr$
$(pizza(C,N, S) \wedge store(SN, A, P) \wedge sells(SN, C, Pr) \wedge (A = « College Park » \vee A = « Greenbelt »)$
$\wedge N = \text{"pepperoni"} \wedge S = 10 \wedge Pr<8)\}$

Find the codes of the most expensive pizzas – assume the scheme of the database is reduced to a relation pizza(code, price) to simplify –

$\{<C1> \mid \exists N1\ \exists S1\ \forall C2\ \forall N2\ \forall S2$
$(pizza(C1, N1, S1) \wedge (pizza(C2, N2, S2) \Rightarrow P1 \geq P2))\}$

Find the names of the stores that sell all the pizzas

$\{<SN> \mid \exists A\ \exists P\ \forall C\ \forall N\ \forall S\ \exists Pr$
$(store(SN, A, P) \wedge (pizza(C,N, S) \Rightarrow sells(SN, C, Pr)))\}$