DISCRETE MATHEMATICS ASSIGNMENT NO.4

EXERCISE 1.5
29. Suppose the domain of the propositional function *P(x, y)* consists of pairs x and y, where x is 1, 2, or 3 and y is 1, 2, or 3. Write out these propositions using disjunctions and conjunctions.
a) $\forall x\ \forall y\ P(x, y)$ **b)** $\exists x\ \exists y\ P(x, y)$
c) $\exists x\ \forall y\ P(x, y)$ **d)** $\forall y\ \exists x\ P(x, y)$

EXERCISE 1.6
3. What rule of inference is used in each of these arguments?
c) If it is rainy, then the pool will be closed. It is rainy.
Therefore, the pool is closed.
d) If it snows today, the university will close. The university is not closed today. Therefore, it did not snow today.
e) If I go swimming, then I will stay in the sun too long.
If I stay in the sun too long, then I will sunburn. Therefore, if I go swimming, then I will sunburn.

9. For each of these collections of premises, what relevant conclusion or conclusions can be drawn? Explain the rules of inference used to obtain each conclusion from the premises.
d) "Every computer science major has a personal computer."
"Ralph does not have a personal computer."
"Ann has a personal computer."
e) "What is good for corporations is good for the United States." "What is good for the United States is good for you." "What is good for corporations is for you to buy lots of stuff."
f) "All rodents gnaw their food."
"Mice are rodents."
"Rabbits do not gnaw their food."
"Bats are not rodents."

13. For each of these arguments, explain which rules of inference are used for each step.
b) "Somebody in this class enjoys whale watching. Every person who enjoys whale watching cares about ocean pollution. Therefore, there is a person in this class who cares about ocean pollution."
c) "Each of the 93 students in this class owns a personal computer. Everyone who owns a personal computer can use a word processing program. Therefore, Zeke, a student in this class, can use a word processing program."
d) "Everyone in New Jersey lives within 50 miles of the ocean. Someone in New Jersey has never seen the ocean. Therefore, someone who lives within 50 miles of the ocean has never seen the ocean."

SETS
Q. Draw the Venn diagrams of the following:
1 - (A ∩ B) ∩ C'

2 - A' ∪ (B ∪ C)

3 - (A ∩ B') ∪ C'

4 - (A - B) ∩ C