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Department: **Computer Science (200 Level)**

Course: **CSC 242 (Foundations of Computer Science)**

ASSIGNMENT SOLUTIONS

Question 1

p: The election is decided

q: The votes have been counted

- a. **$\neg p$** : The election is not decided
- b. **$p \vee q$** : The election is decided or the votes have been counted
- c. **$\neg p \wedge q$** : The election is not decided and the votes have been counted
- d. **$q \rightarrow p$** : If the votes have been counted then the election is decided
- e. **$\neg q \rightarrow \neg p$** : If the votes have not been counted then the election is not decided
- f. **$\neg p \rightarrow \neg q$** : If the election is not decided then the votes have not been counted
- g. **$p \leftrightarrow q$** : The election is decided if and only if the votes have been counted
- h. **$\neg q \vee (\neg p \wedge q)$** : The votes have not been counted or the election is not decided and the votes have not been counted or the votes have been counted

TRUTH TABLE

p	q	$\neg p$	$\neg q$	$p \vee q$	$\neg p \wedge q$	$q \rightarrow p$	$\neg q \rightarrow \neg p$	$\neg p \rightarrow \neg q$	$p \leftrightarrow q$	$\neg q \vee (\neg p \wedge q)$
T	T	F	F	T	F	T	T	T	T	F
T	T	F	F	T	F	T	T	T	T	F
T	F	F	T	T	F	T	F	T	F	T
T	F	F	T	T	F	T	F	T	F	T
F	T	T	F	T	T	F	T	F	F	T
F	T	T	F	T	T	F	T	F	F	T
F	F	T	T	F	F	T	T	T	T	T
F	F	T	T	F	F	T	T	T	T	T

Question 2

p: I bought a lottery ticket this week

q: I won the million dollar jackpot

- a. $\neg p$: I did not buy a lottery ticket this week
- b. $p \vee q$: I bought a lottery ticket this week or I won the million dollar jackpot
- c. $p \rightarrow q$: If I bought a lottery ticket this week then I won the million dollar jackpot
- d. $p \wedge q$: I bought a lottery ticket this week and I won the million dollar jackpot
- e. $p \leftrightarrow q$: I bought a lottery ticket this week if and only if I won the million dollar jackpot
- f. $\neg p \rightarrow \neg q$: If I did not buy a lottery ticket this week then I did not win the million dollar jackpot
- g. $\neg p \wedge \neg q$: I did not buy a lottery ticket this week and I did not win the million dollar jackpot
- h. $\neg p \vee (p \wedge q)$: I did not buy the lottery ticket this week or I bought the lottery ticket this week and I did not buy the lottery ticket this or I won the million dollar jackpot

Question 3

p: Swimming at the New Jersey shore is allowed

q: Sharks have been spotted near the shore

- a. $\neg q$: Sharks have not been spotted near the shore
- b. $p \wedge q$: Swimming at the New Jersey shore is allowed and sharks have been spotted near the shore
- c. $\neg p \vee q$: Swimming at the New Jersey shore is not allowed or sharks have been spotted near the shore
- d. $p \rightarrow \neg q$: If swimming at the New Jersey shore is allowed then sharks have not been spotted near the shore
- e. $\neg q \rightarrow p$: If sharks have not been spotted near the shore then swimming at the New Jersey shore is allowed
- f. $\neg p \rightarrow \neg q$: If swimming at the New Jersey shore is not allowed then sharks have not been spotted near the shore
- g. $p \leftrightarrow \neg q$: Swimming at the New Jersey shore is allowed if and only if sharks have not been spotted near the shore
- h. $\neg p \wedge (p \vee \neg q)$: Swimming at the New Jersey shore is not allowed and swimming at the New Jersey shore is allowed or swimming at the New Jersey shore is not allowed and sharks have not been spotted near the shore