CSE 015: Discrete Mathematics
Homework #6
Solution

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Chapter 2.1

1. **Question 12: Determine whether these statements are true or false.**
   (a) 12a: True
   (b) 12b: True
   (c) 12d: True
   (d) 12f: True
2. **Question 20: Find two sets A and B such that A belongs to B and A, subset of B**
   (a) 20: A = {1}, B = {1, 2}
3. **Question 26: Determine whether each of these sets is the power set of a set, where a and b are distinct elements**
   (a) 26a: This is not a powerset.
   (b) 26d: This is a powerset.
4. **Question 34: Let A = a, b, c, B = x, y, and C = 0, 1**
   (a) 34a: A × B × C.: {(a,x,0),(a,x,1),(a,y,0),(a,y,1),(b,x,0),(b,x,1),(b,y,0),(b,y,1),(c,x,0),(c,x,1),(c,y,0),(c,y,1)}
   (b) 34b: C × B × A.: {(0,x,a),(0,x,b),(0,x,c),(0,y,a),(0,y,b),(0,y,c),(1,x,a),(1,x,b),(1,x,c),(1,y,a),(1,y,b),(1,y,c),}

Chapter 2.2

1. **Question 4:**
   (a) 4c: There are no elements that result, hence there is an empty set,∅.
   (b) 4d: {f,g,h}
2. **Question 8: Prove the idempotent laws in Table 1 by showing that**
   (a) 8a: A ∪ A = A, A ∪ A = {x | x ∈ A ∨ x ∈ A}, and lets set T as ({x ∈ A}), {x | T ∨ T}, {x | T}, A, which means that A ∪ A = A.

(b) 8b: $A \cap A = A$, $A \cap A = \{x \mid x \in A \wedge x \in A\}$, and lets set T as ($\{x \in A\}$), $\{x \mid T \wedge T\}$, $\{x \mid T\}$, A, which means that $A \cap A = A$.

3. **Question 10:**

(a) 10a: A - $\emptyset$ = A, A = {1,2}, $\emptyset$, {1,2} - {} = {1,2}; hence it is equal to A.

(b) 10b: $\emptyset$ - A = $\emptyset$, A = {1,2}, $\emptyset$, {} - {1,2} = {}; hence it is equal to $\emptyset$.