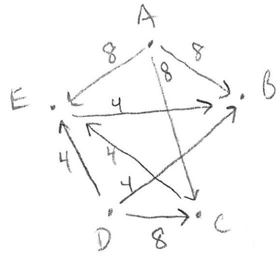
Chapter 4 homework solutions (day 2)

2)

2	2	4
A	A	D
B	E	A
D	D	C
C	B	E
E	C	B

A:B 8:0
A:C 8:0
A:D 4:4
A:E 8:0
B:C 4:4
B:D 2:6
B:E 2:6
C:D 0:8
C:E 6:2
D:E 6:2



dominating sets: $\boxed{\{A, B, C, D, E\} \quad \{A, D\}}$

Smith set = $\boxed{\{A, D\}}$

Pairwise Comparison:

A = $3\frac{1}{2}$ B = $\frac{1}{2}$ C = $1\frac{1}{2}$ D = $3\frac{1}{2}$ E = 1

total = 10 ✓ $\boxed{W = \{A, D\}}$

6.) $X \in S$ iff $X \in$ every dominating set.

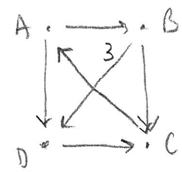
If $X \in S$ then $X \in$ smallest dominating set. Since the dominating sets nest, X would be in all dominating sets.

If $X \in$ every dominating set then $X \in$ smallest dominating set, So $X \in S$.

7)

1	1	1
A	C	B
B	A	D
D	B	C
C	D	A

A:B 2:1
A:C 1:2
A:D 2:1
B:C 2:1
B:D 3:0
C:D 1:2



seq winner: A B C D W = D

$S = D_0 = \{D, A, B, C\}$.

8) If an example shows that sequential winner violates unanimity, then $\exists$ candidates X, Y such that X:Y is N:0 and the sequential winner is Y. Since sequential comparison is Smith fair, we know $Y \in S$. If the Smith method were used, then W = S, so $Y \in W$, violating unanimity for the Smith method.