Solution for Problem set 7

1.

A situation where one of the players can send a message to the other player, usually regarding to what he intends to play in next stage is called cheap talk because it does not affect the players' payoff in the next stage of the game and thus it is not a commitment device that can enforce the player to follow his own message. It may be molded in the following way: first player 1, say, announces an action that he plans to take in the game and then the original game is played. If we look the induced strategic game, all the rows in which player 1 chooses different messages but the same action in the second stage of the game are the same. The original set of Nash equilibria (or SPE) is not affected by the messages. Nevertheless, if the game has more than one Nash equilibrium, the message procedure may be viewed as a coordination device, or a method to choose among the Nash equilibria of the game.

2.

Player 1 has eight strategies, each of which can be written as (x, y, z), where $x \in \{0, D\}$ and y and z are each members of $\{B, S\}$, y being the action that player 1 plans in BoS if player 2 chooses 0 and z being the action that player 1 plans in BoS if player 2 chooses D. Player 2 has sixteen strategies, each of which can be written as a pair of members of the set $\{(0, B), (0, S), (D, B), (D, S)\}$, the first member of the pair being player 2's actions if player 1 chooses 0 and the second member of the pair being player 2's actions if player 1 chooses D.

Weakly dominated actions can be iteratively eliminated as follows.

1. (D, S,S) is weakly dominated for player 1 by (0, B, B)
2. Every strategy (a, b) of player 2 in which either a or b is (D, B) is weakly dominated by the strategy that differs only in that (D, B) is replaced by (0, S).
3. Every strategy (x, y, B) of player 1 is weakly dominated by (x, y, S) (since there is no remaining strategy of player 2 in which he chooses (D, B)).
4. Every strategy (a, b) of player 2 in which b is either (0, B) or (0, S) is weakly dominated by the strategy that differs only in that b is replaced by (D, S)

(since in every remaining strategy player 1 chooses S after player 2 chooses D).

The game that remains is

	((0,B),(D,S))	((0,S),(D,S))	((D,S),(D,S))
(0,B, S)	3, 1	0, 0	1, 2
(0,S, S)	0, 0	1, 3	1, 2
(D,B,S)	0, 2	0, 2	0, 2

5. (D, B, S) is weakly dominated for player 1 by (0, B, S)
6. (0, B), (D, S)) is weakly dominated for player 2 by ((D, S), (D, S))
7. (0, B, S) is weakly dominated for player 1 by (0, S, S)
8. ((D, S), (D, S)) is strictly dominated for player 2 by ((0, S), (D, S))

The only remaining strategy pair is ((0, S, S), ((0, S), (D, S))), yielding the outcome (1, 3) (the one that player 2 most prefers).