Problem 1

Answer: 3

First, consider the best option for Player 1 for each strategy of Player 2:
▷ Player 2 chooses X: Player 1 chooses C;
▷ Player 2 chooses Y: Player 1 chooses B;
▷ Player 2 chooses Z: Player 1 chooses A or C.
Next, consider the best option for Player 2 for each strategy of Player 1:
▷ Player 1 chooses A: Player 2 chooses X or Z;
▷ Player 1 chooses B: Player 2 chooses Y;
▷ Player 1 chooses C: Player 2 chooses X.
Therefore, there are **3 Nash equilibria**:
▷ Player 1 chooses A and Player 2 chooses Z;
▷ Player 1 chooses B and Player 2 chooses Y;
▷ Player 1 chooses C and Player 2 chooses X.

Problem 2

Answer: Belief disagreement may lead to non-Nash outcomes, and its realization is unpredictable.

Problem 3

Answer: In a Nash equilibrium, both players choose C.

First, consider the best option for Player 1 for each strategy of Player 2:
▷ Player 2 chooses A: Player 1 chooses C;
▷ Player 2 chooses B: Player 1 chooses C;
▷ Player 2 chooses C: Player 1 chooses C.
The best strategy for Player 1 is always C.
Next, consider the best option for Player 2 for each strategy of Player 1:
▷ Player 1 chooses A: Player 2 chooses C;
▷ Player 1 chooses B: Player 2 chooses C;
▷ Player 1 chooses C: Player 2 chooses C.
The best strategy for Player 2 is always C. Therefore, **a Nash equilibrium DOES exist**, and it corresponds to the situation where **both players choose C**.

Problem 4

Answer: This game is similar to the prisoner's dilemma in that it has a better outcome than Nash equilibrium for all players.

If both players chose strategy B, that would be better for both of them.

Problem 5

Answer:
▷ Version 1: To play a game many times and have better and better beliefs against others' behavior.
▷ Version 2:
  – There can be many Nash equilibria in a game.
  – The *de facto* standard of a new technology may not be efficient.
  – A game might have good and bad Nash equilibria (the former are better than the latter for everyone).

Problem 6

Answer: The prisoner's dilemma, because defection is best for both players and they do not consider that mutual cooperation can be attained.

Problem 7

Answer:
▷ Version 1: Agreement is fulfilled without imposing penalty or reward.
▷ Version 2: There is no guarantee that such an adjustment process always converges to a Nash equilibrium.