ECO316: Applied Game Theory

Final Exam Solutions and Grading Key

Fall 2025

1. **Retirement Ages (10 points):**

   (a) The Nash Equilibria are (63, 63), (64, 64), (65, 65), (66, 66), and (67, 67). To show that each are Nash equilibria, the value of retiring is 5 and the value of working is $68 - X \leq 5$, so neither Alice nor Bob would switch and continue working. (1 point)

   First, note that no player will ever retire at age 62 or younger as $68 - X > 5$ for $X \in \{60, 61, 62\}$ and no player will continue working at an age 67 or older at $68 - X \leq 1$ for $X \in \{67, 68, 69, 70\}$. So retiring before 63 or working after 66 cannot be an equilibrium. (2 points)

   Finally, to show that Alice and Bob must retire at the same age, suppose that Alice retires at an age $X < 67$ and Bob does not. But then, Alice's payoff is $68 - X > 1$, so she would prefer