ECO316: Applied Game Theory

Final Exam

Fall 2025

Please answer all questions below in the exam booklet. Where you are asked to 'show' or 'prove' a claim, please provide a formal (mathematical) argument for your answer; if you are asked to 'argue' or 'discuss' a claim, a verbal argument will suffice. There are 64 total points available on this exam.

1. **Three-Player Rubinstein Bargaining (20 points):** Consider a variant of the Rubinstein bargaining model where there are three players (label them player 1, player 2, and player 3). There are two periods: in period 1, player 1 makes an offer which splits the surplus between the three players (x, y, z) such that $x + y + z = 1$. If the offer is rejected, then one of the other two players is chosen randomly to make the next offer in period 2. With probability p, player 2 is chosen to make an offer and with probability q, player 3 is chosen. For now, assume $q = 1 - p$ and note that the players do not know who will be chosen when deciding whether to accept the period 1 offer. If an offer is rejected in period 2,