Mock exam answers for part ii paper 1 a

Aubrey Clark

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Exercise 1

A T and L are strictly dominated, and there aren't any pure strategy Nash equilibrium. There is a unique mixed strategy Nash equilibrium, given by $Pr(M) = 2/3$, $Pr(B) = 1/3$, $Pr(C) = 1/2$, and $Pr(R) = 1/2$.

B 1 minmax's 2 with T. 2 minmax's 1 with L. By Fudenberg and Maskin (1986), V^* is the set of feasible payoffs that strictly dominate (1,1), the minmax point.[1]

C Take a one-shot correlated strategy profile (s_1, s_2) with payoffs (v_1, v_2). Phase (A): play s_i each period as long as (s_1, s_2) was played in the previous period. After any deviation from phase (A) go to phase (B): both players minmax for $n(\delta)$ rounds. If there are any deviations while in phase (B), then begin phase (B) again.

Exercise 2

1 Ignore two of the three events. Undesirable for those wanting a triathalon. (Although, randomization over the dictating event seems to work, and seems much more reasonable.)

2 Maybe sum rankings across the three events. Satisfies α, β, and not a dictatorship so doesn't satisfy γ.

Exercise 3

a Player 1's strategies are U or D. Player 2's strategies are LL, LR, RL, RR. There are two proper subgames, one for each move of 1.

[1] Given that this result was not directly in the notes, it's fine if you used Friedman (1971,77) and said V^* is the set of feasible payoffs that Pareto dominate the static Nash equilibrium payoffs via a suitably described Nash-reversion strategy.

b Via backward induction, 2,1.

c Subgame-perfect equilibrium are Nash equilibrium, so 2,1 is one. For others, draw out the normal form

	LL	LR	RL	RR
U	2,1	2,1	0,0	0,0
D	4,-1	1,1	4,-1	1,1

1,1 is the other.

d Yes, 2 can mix between L and R off the path of play. (By Kuhn's theorem there exists a corresponding mixed strategy.)

e There are no proper sub-games, so sub-game perfect and Nash equilibrium are the same.

f The normal form is given by the 2-by-2 payoff matrix. The unique Nash equilibrium outcome is 1,1.

g We recover game A.[2]

Exercise 4, excluded from exam

i Consider a two-player non-zero sum game in normal form. Player 1 gets a new strategy that can be played, that is, we add a new row to the payoff matrix. Give an example to show that player 1's equilibrium payoff can decrease as a result of this increased flexibility in strategic choice.

ii Consider a two-player zero sum game. Again assume that Player 1 gets a new strategy that can be played. What can happen to player 1's equilibrium payoff? Can it decrease? Why or why not?

[2] This question demonstrates a fragility of Nash and sub-game perfect equilibrium to this type of change in the game's information structure. A solution concept called *sequential equilibrium*, proposed by Kreps and Wilson (1982), helps deal with some of these issues.