1 Problem set 5

1)

a) (T,T,...,T)

b) Sequential rationality is already violated, so what should the player expect now?

c) How would *you*?

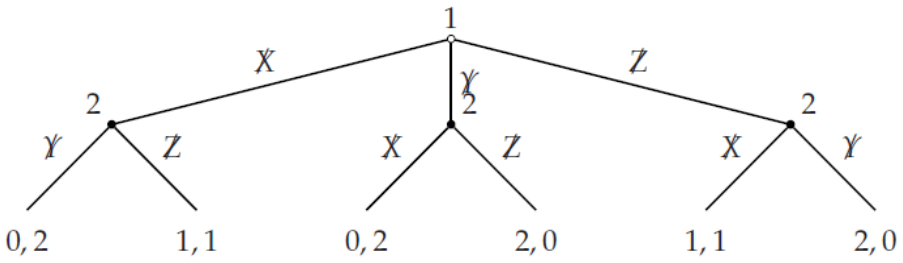
I would probably play pass a couple of times.

2)

a) (P,P,...,P)

b) Out unless I was one of the last players. You cannot expect 100 players to resist the temptation to take the money and run.

3) Osborne 163.2 and 4) 173.3



P1 x>y>z

P2 z>y>x

	YXX	YXY	YZX	YZY	ZXX	ZXY	ZZX	ZZY
X	0, 2	0, 2	0, 2	0, 2	1, 1	1, 1	1, 1	1, 1
Y	0, 2	0, 2	2, 0	2, 0	0, 2	0, 2	2, 0	2, 0
Z	1, 1	2, 0	1, 1	2, 0	1, 1	2, 0	1, 1	2, 0

Nash

i) (z, ((y|x),(x|y),(x|z)))

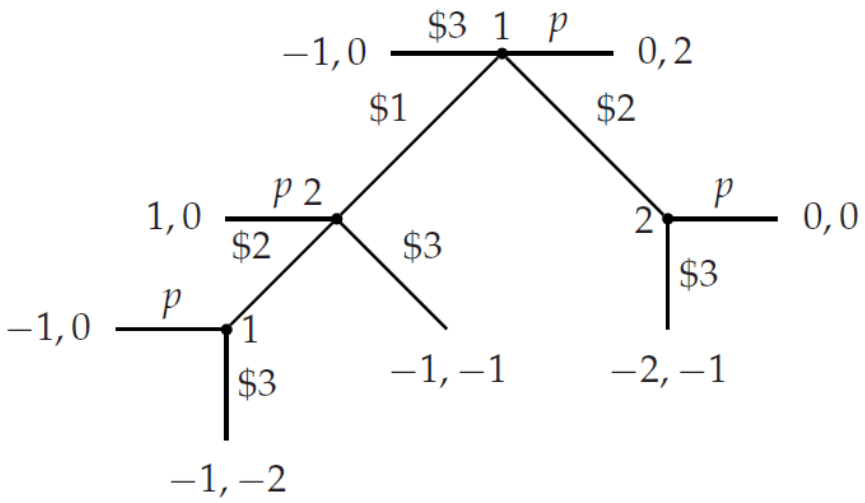
ii) (z, ((z|x),(x|y),(x|z)))

ii is not SPNE

but note outcome is exactly the same

5) In SPNE army 1 attacks, army 2 retreats. However, if army 2 could just burn the bridge (the option to retreat), army 1 will not attack in equilibrium.

6) Osborne 176.1
good is worth $v = 2$, players have wealth $w = 3$
max 3 moves in the game



Four SPNEs. In all of them player 2 passes after player one bids 2.
Additionally:
In equilibrium 1)
P1 bids 3 after a history (player 1's first move , player 2's) = (1,2)
P2 passed after seeing a bid of 1, player 1 bids 1
In 2)
P1 passes after a history (player 1's first move , player 2's) = (1,2)
P2 passed after seeing a bid of 1, player 1 bids 1

In 3)
P1 passes after a history (player 1's first move , player 2's) = (1,2)
P2 bids 2 after 1, player 1 passes in the beginning
In 4)
P1 passes after a history (player 1's first move , player 2's) = (1,2)
P2 bids 2 after 1, player 1 bids 2 in the beginning
There are three outcomes possible, P1 passes in the beginning, P1 bids 1 and P2 passes, P1 bids 2 and P2 passes.

7) Osborne 177.1
a)
Players: firm and union

Terminal histories: (w,Y,L) or (w,N)
Player function: The union plays in beginning, after that the firm chooses Y,N and then L
Preferences: profit for the firm, wL for union
b) Start from the end
The wage is w, the firm has accepted. What is the optimal L?

If $L \leq 50$ we have
$\max L(100 - L)1 - wL$
FOC
$100 - 2L = w$
$\Longrightarrow L = \frac{100 - w}{2}$ if $w \leq 100$, 0 else

So following an offer w, the company any $w < 100$ and is indifferent at any $w \geq 100$
This means, the union will never choose $w \geq 100$ which would lead to zero payoff.
Lower w leads to $L = \frac{100 - w}{2}$ so the union's payoff is
$\frac{100 - w}{2} w$
FOC
$\frac{100 - 2w}{2} = 0$
$\Longrightarrow w = 50$
this leads to $L = 25$

c) Union makes 50*25=1250
firm makes 25*75=625
Can there be a w and L that makes them better off? Sure, this was the non-cooperative outcome!
if $L > 50$
$wL > 1250$
$2500 - wL > 625$
if $L \leq 50$
$wL > 1250$
$L(100 - L) - wL > 625$
There are many w, L that satisfy the inequalities, for example L=100, w=15
d) The firm can use non credible threats, e.g. reject any $w > 20$.