MA 235 **Final Examination, 2012** **Answers**

1. (a) E[L] = EL = \$16.00. Indifferent between L and \$$K$ iff k = \$16.00.
(b) Eu[L] = 1. Indifferent between L and \$$K$ iff k = \$19.00.
(c) Since u(EL) < Eu[L], Bev is risk-acceptant.
(d) \$$K$ is the certainty equivalent of L, CE[L].

2. The value of G_2 is 2. The unique optimal strategy for II is c_2. The optimal strategies for I are all strategies of the form $xr_1 + (1 - x)r_2$ for $½ \le x \le 1$.

3. There are many examples. For instance, in the two-person zerosum game at the right, r_2 dominates r_1. But (r_1, c_1) is a saddle point, even though r_1 is a dominated strategy.
(Note that (r_2, c_1) is also a saddle point.)

	c_1	c_2
r_1	0	1
r_2	0	2

4.(a) If $p = 0.2$ and $K = 600$, the optimal decision is *Up*. [Eu(*Up*) = 350, Eu(*Down*) = 280.]
(b) If $p = 0.7$, Eu(*Up*) $\ge$ Eu(*Down*) iff $K \le -50$. Because $K > 0$ is required, the required set of values of K is empty; i.e., the optimal decision is never *Up*.

5.(a) G_5: 4 × 4
Eliminate r_4 as it is weakly dominated by r_3.
Eliminate c_2 as it is strictly dominated by c_3 and weakly dominated by c_1.
Eliminate c_4 as it is strictly dominated by c_3 and weakly dominated by c_1 and c_2.
G_5': 3× 2
Eliminate r_2 as it is strictly dominated by r_1 and r_3.
G_5'': 2 × 2
No dominance relations among remaining rows or among remaining columns. Therefore G_5 is not dominance solvable.
(b) Pure-strategy Nash equilibria (r_1, c_1) and (r_3, c_3).

6. (i) Imperfect Information: Some player must make a choice not knowing some previous choice, or the outcome of some previous chance event, in the game.
(ii) Imperfect Information: Some player must make a choice not knowing some previous choice he or she made in the game.
(iii) Incomplete Information: Some player lacks basic information about the game, such as the utilities of another player for one or more outcomes.

7. G_7 has four pure-strategy Nash equilibria, (t_1t_2, B_1T_2), (t_1b_2, T_1T_2), (b_1t_2, B_1B_2), and (b_1b_2, T_1B_2). Only (b_1b_2, T_1B_2) is Subgame-Perfect.

8. G_8 has four pure-strategy Nash equilibria, (t_1, t_2, t_3), (b_1, b_2, t_3), (b_1, t_2, b_3), and (b_1, b_2, b_3). The first three [(t_1, t_2, t_3), (b_1, b_2, t_3), (b_1, t_2, b_3)] are Subgame-Perfect. The fourth [(b_1, b_2, b_3)] is not.

9. The game G_9 has three subgame-perfect equilibria, as follows:

$(r_1\ l_2, R)$, with utility profile [3, −1],

$(l_1\ r_2, L)$, with utility profile [4, 2],

$((½)\ r_1\ l_2 + (½)\ r_1\ r_2, (2/5)L + (3/5)R)$, with utility profile [3, −1].

10. (a) —

(b) —

(c) $p \geq 2/3$.

(d) $(x^*; y_C^*, y_A^*) = (1/3; 1/9. 1)$

11. (a) The Basic Bargaining Set is (u_1, u_2) such that $u_2 = -½\ u_1 + 9/2$ for $2 \leq u_1 \leq 4$.

(b) $N = (4.5, 2.25)$

(c) $K = (31/8, 41/16) \cong (3.875, 2.571)$, based on $a^o = (5, 3.5)$.

12. (a) —

(b) (i) — (ii) The given profile. [2, 3, 1], is the unique profile in the core..

(c) $\varphi[v] = [11/6, 20/6, 5/6] \cong [1.83, 3.33, 0.83]$.