Problem Set 4

Q1.

Consider the two-player game with vNM preferences in which the players' preferences over deterministic action profiles are the same as in Hawk-Dove (given below) and their preferences over lotteries satisfy the following two conditions. Each player is indifferent between the outcome (Passive, Passive) and the lottery that assigns the probability $1/2$ to (Aggressive, Aggressive) and probability $1/2$ to the outcome in which she is Aggressive and the other player is Passive, and between the outcome in which she is Passive and the other player is Aggressive and the lottery that assigns probability $2/3$ to the outcome (Aggressive, Aggressive) and probability $1/3$ to the outcome (Passive, Passive). Find payoffs whose expected value represents these preferences (take each player's payoff to (Aggressive, Aggressive) to be 0 and each player's payoff to the outcome in which she is Passive and the other player is Aggressive to be 1). Find the mixed strategy NE of the resulting strategic game.

	Aggressive	*Passive*
Aggressive	0, 0	3, 1
Passive	1, 3	2, 2

Q2.

Find all the NE of the following game (both psNE and msNE)

a.

	L	*R*
T	0, 1	0, 2
B	2, 2	0, 1

b.

	B	*S*	*X*
B	4, 2	0, 0	0, 1
S	0, 0	2, 4	1, 3

Q3.

Members of a population of car drivers are randomly matched in pairs when they simultaneously approach intersections from different directions. In each interaction, each driver can either stop or continue. The drivers' preferences are represented by the expected value of the payoff functions given below in the matrix; the parameter $\epsilon, \ with \ 0 < \epsilon < 1$, reflects the fact that each driver dislikes being the only one to stop. Find the pure and mixed strategy NE of the game.

	Stop	*Continue*
Stop	$1, 1$	$1-\epsilon, 2$
Continue	$2, 1-\epsilon$	$0, 0$

Q4. Find all the NE (pure and mixed) of the matching pennies game with the following payoffs

	Head	*Tail*
Head	$1, -1$	$-1, \quad 1$
Tail	$-1, \quad 1$	$1, -1$