※ 考生請注意：本試題不可使用計算機。　請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

1. (25%) Suppose the market of cooking oil is a perfectly competitive with demand function $P(Q, a)$ where $Q$ is the aggregate output of $n$ symmetric firms each bearing the same cost function $c(q)$ when producing $q$ units, and $a$ is a factor of demand reflecting consumers' worries in food security. Suppose $\frac{\partial P}{\partial a} < 0$ so that increasing worries in food security will cause a decrease in demand. Also assume that $\frac{\partial P}{\partial Q} < 0$, $c'(q) > 0$, and $c''(q) > 0$.

   (a) (10%) Find the impact on **short run** market equilibrium of cooking oil from increasing worries in the safety issues, $dP^*/da$.

   (b) (15%) Find the impact on **long run** market equilibrium of cooking oil from increasing worries in the safety issues, $dP^*/da$.

2. (15%) Show that tax incidence on consumers is likely to exceed 100% in a monopoly market

3. (25%) Consider the consumer with utility function $u(x_1, x_2) = x_1 + \ln x_2$ and income $w$. Suppose the consumption of commodity 1 is subject to a specific tax of $\$s$ per unit while commodity 2 is subject to a specific tax of $\$t$. (Assume $w > P_1 + s$)

   (a) (10%) Find the optimal consumption of the two commodities.

   (b) (15%) Which commodity would be sensitive to the increase in the specific tax?

4. (15%) There are two countries A and B producing two goods X and Y. Suppose PPF of A is $Y = 10 - X$ while that of B is $Y = 10 - X^2$. Find the joint PPF of the two countries and discuss its implication.

5. (10%) If a monopoly produces with **constant MC equal to \$18 and fixed costs \$10**, and faces a market demand as shown in the table. Suppose commodities must be sold in discrete units. Find the deadweight loss caused by the monopoly.

   | P | 24 | 23 | 22 | 21 | 20 | 19 | 18 | 17 |
   |---|----|----|----|----|----|----|----|----|
   | Q | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

6. (10%) Explain when and how it is likely to increase GDP by raising the minimum wage?