Question 1

(a) Then

> **The value of his endowment is 180.**

(b) MRS $= x_t/(2x_e) = 1.5/3 = 1/2$ implies $x_e = x_t$. The budget line equation is $1.5x_e + 3x_t = 180$. Thus,

> **$x_e = 40$, $x_t = 40$.**

Question 2 MRS $= 3x_2/x_1 = 1$. Thus,

> **The equation of the income offer curve is $x_2 = \frac{1}{3}x_1$.**

In addition, $x_1^3 x_2 = 6,912$. Thus, $x_1^4 = 20,736$.

The expenditure minimizing consumption is

> **$x_1 = 12$, $x_2 = 4$.**

> **The person needs \$32.**

Question 3 MRS $= c_2/(0.9c_1) = 1.15$. Thus, the income offer curve is $c_2 = 1.035c_1$. The budget line equation is $1.15c_1 + c_2 = 2,000(1.15) + 19,550 = 21,850$. Thus, $2.185c_1 = 21,850$. Therefore,

> **Joe's consumption is $c_1 = 10,000$, $c_2 = 10,350$.**

> **This year, Joe borrows \$8,000**

Suppose Joe's credit card has a credit limit of 1,000 Dollars, and he cannot get credit from any other source. Then

> **Joe borrows \$1,000**

Question 4 MRS $= c/R = w$. Before tax, $c = 10R$. The budget line equation is $10R + c = 1,200 + 200 = 1,400$. Thus, $20R = 1,400$, i.e., $R = 70$.

After tax, $c = 8R$. The budget line equation is $8R + c = 960 + 200 = 1,160$. Thus, $16R = 1,160$, i.e., $R = 72.5$.

The person's labor supply *before* the tax is introduced is **50**

The person's labor supply *after* the tax is introduced is **47.5**

Question 5 MRS $= c/R = 14.4$, i.e., $c = 14.4R$. In addition, $Rc = 25,000$ in order for utility to be at the after-tax level. Thus, $14.4R^2 = 25,000$, i.e.,

$$\boxed{R = 41.667,\ c = 600}$$

The value of this consumption at prices $w = 14.4$ and 1 is $\boxed{\$\ 1,200}$

$w\bar{R} = 1,440$ when $w = 14.4$.

$$\boxed{\textbf{Thus, the loss to the person is 240}}$$

Total tax revenue is $50(4.4){=}220$. The deadweight loss is therefore 20. Thus, the deadweight loss is $\boxed{\textbf{9.1\%}}$ of the tax revenue.

Question 6

$$\boxed{\textbf{After tax utility is 20}}\ .$$

In order to obtain the after-tax utility at before-tax prices $(p_1 = 2,\ p_2 = 3)$ the person's income would have to be $\boxed{\boldsymbol{m = 40}}$.

Thus, the deadweight loss generated by the tax is $\boxed{\textbf{20}}$.

The government's tax revenue is $\boxed{\textbf{0}}$.

Question 7 The expected utility from playing the lottery is $\boxed{\textbf{4.59710}}$.

The lotteries' certainty equivalent is $\boxed{\textbf{99.20}}$. Thus, playing the lottery is equivalent to losing $\boxed{\textbf{80}}$ cents with certainty.