Question 1

(a) Then

The value of his endowment is 720.

(b) MRS $= x_t/(2x_e) = 3/2$ implies $3x_e = x_t$. The budget line equation is $3x_e + 2x_t = 720$. Thus,

$$\boldsymbol{x_e = 80 \ , \ x_t = 240 \ .}$$

Question 2 MRS $= x_2/(4x_1) = 1$. Thus,

The equation of the income offer curve is $x_2 = 4x_1$.

In addition, $x_1 x_2^4 = 8,192$. Thus, $x_1(4x_1)^4 = 8,192$.

The expenditure minimizing consumption is

$$\boldsymbol{x_1 = 2, \ x_2 = 8.}$$

The person needs $20.

Question 3 MRS $= c_2/(0.9c_1) = 1.2$. Thus, the income offer curve is $c_2 = 1.08c_1$. The budget line equation is $1.2c_1 + c_2 = 4,000(1.2) + 13,440 = 18,240$. Thus, $2.28c_1 = 18,240$. Therefore,

Joe's consumption is $c_1 = 8,000$, $c_2 = 8,640$.

This year, Joe borrows $4,000

Suppose Joe's credit card has a credit limit of 2,000 Dollars, and he cannot get credit from any other source. Then

Joe borrows $2,000

Question 4 MRS $= c/R = w$. Before tax, $c = 40R$. The budget line equation is $40R + c = 4,000 + 200 = 4,200$. Thus, $80R = 4,200$, i.e., $R = 52.5$.

After tax, $c = 20R$. The budget line equation is $20R + c = 2,000 + 200 = 2,200$. Thus, $40R = 2,200$, i.e., $R = 55$.

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

The person's labor supply *after* the tax is introduced is **45**

Question 5 MRS $= c/R = 20$, i.e., $c = 22.5R$. In addition, $Rc = 36,000$ in order for utility to be at the after-tax level. Thus, $22.5R^2 = 36,000$, i.e.,

$\boxed{\boldsymbol{R = 40,\ c = 900}}$

The value of this consumption at prices $w = 22.50$ and 1 is $\boxed{\textbf{\$ 1,800}}$

$w\bar{R} = 2,700$ when $w = 22.5$.

$\boxed{\textbf{Thus, the loss to the person is 900}}$

Total tax revenue is 50(4.4)=750. The deadweight loss is therefore 150. Thus, the deadweight loss is $\boxed{\textbf{20\%}}$ of the tax revenue.

Question 6

$\boxed{\textbf{After tax utility is 40}}$.

In order to obtain the after-tax utility at before-tax prices ($p_1 = 5$, $p_2 = 2$) the person's income would have to be $\boxed{\boldsymbol{m = 80}}$.

Thus, the deadweight loss generated by the tax is $\boxed{\textbf{120}}$.

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

Question 7 The expected utility from playing the lottery is $\boxed{\textbf{3.89607}}$.

The lotteries' certainty equivalent is $\boxed{\textbf{49.308}}$. Thus, playing the lottery is equivalent to losing $\boxed{\textbf{61}}$ cents with certainty.