Name:

E-mail: *@uiuc.edu*

All questions must be answered on this test form!
For each question you must show your work and (or) provide a clear argument.
All graphs must be accurate to get credit.

Question 1 The income offer curve equation is $2x_2/(3x_1) = 2$, i.e., $x_2 = 3x_1$. The budget line equation is $2x_1 + x_2 = 30$. Thus,

$$\boxed{\boldsymbol{x_1 = 6, x_2 = 18}}$$

Question 2 The Lagrangean is given by $\mathfrak{L} = \ln(x_1)+\ln(x_2)+\ln(300-L)-\lambda(x_1+2x_2-10L)$.

The first order conditions are $1/x_1 = \lambda$, $1/x_2 = 2\lambda$, $1/(300 - L) = 10\lambda$. Thus, $x_1 = 2x_2 = 3,000 - 10L$. Inserting this into the constraint yields $6,000 - 20L - 10L = 0$. Thus,

$$\boxed{\textbf{At the optimum } \boldsymbol{L = 200}}$$

Question 3 A utility function is given by $u(x_1, x_2) = (1/4)x_1x_2^2$. The resulting demand functions are

$$x_1(p_1, p_2, I) = \frac{I}{3p_1}, \quad , x_2(p_1, p_2, I) = \frac{2I}{3p_2}.$$

Then

$$\boxed{\boldsymbol{v(p_1, p_2, I) = \frac{I^3}{27p_1p_2^2}}}$$

To get the expenditure function, solve $u = \frac{I^3}{27p_1p_2^2}$ for I. Thus, $I = 3p_1^{1/3}p_2^{2/3}$.

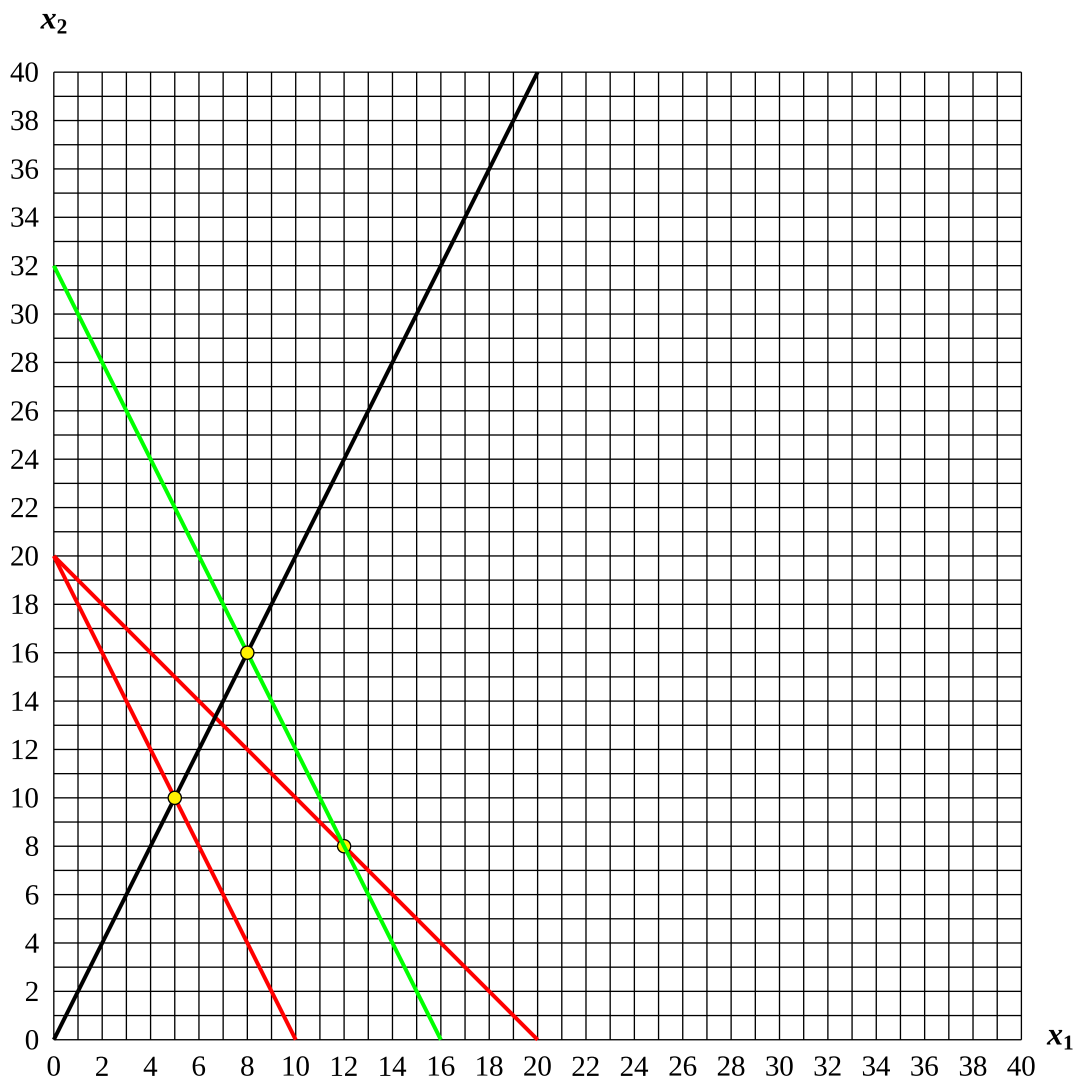
$$\boxed{\boldsymbol{e(p_1, p_2, u) = 3u^{1/3}p_1^{1/3}p_2^{2/3}}}$$

To get Hicksean demand for good 1 we substitute $e(p_1, p_2, u)$ for I in the demand function for good 1, i.e., $h(p_1, p_2, u) = \frac{e(p_1,p_2,u)}{3p_1} = \frac{3u^{1/3}p_1^{1/3}p_2^{2/3}}{3p_1}$.

$$\boxed{\boldsymbol{h_1(p_1, p_2, u) = u^{1/3}\left(\frac{p_2}{p_1}\right)^{2/3}}}$$

Question 4 The Slutzky substitution effect for goods 1 and 2 is $\boldsymbol{\Delta^s x_1 = -4, \Delta^s x_2 = 8}$

The Slutzky income effect for goods 1 and 2 is $\boldsymbol{\Delta^I x_1 = -3, \Delta^I x_2 = -6}$



Question 5 Demand for good 1 after the tax is $x_1 = 200/8 = 25$. Thus,

The government's tax revenue is 75.

Utility after the tax is $v(1, 4, 200) = 100$. Thus,

After tax utility is 100

To get the above after tax utility at prices are $p_1 = p_2 = 1$, we need $I' = e(1, 1, 100)$. Thus,

$\boldsymbol{I' = 100}$

The deadweight loss of the tax is therefore −25.

Question 6 The person solves

$$\max_{\alpha} 28\alpha + 22(100 - \alpha) - 0.2\alpha^2.$$

Thus, $28 - 22 - 0.4\alpha = 0$.

The optimal $\alpha = 15$

Question 7 If the person does not start the business, then the payoff is 160,000. If the person starts the business, then the payoff is 360,000 with probability p and $40,000$ with probability $1 - p$.

(a) Suppose the person's Bernoulli utility function is $u(x) = \sqrt{x}$. The expected utility of not starting the business is 400. The expected utility of starting the business is $600p + 200(1 - p)$. The person is indifferent if $400 = 600p + 200(1 - p)$. Thus,

To start the business $p \geq 0.5$

(b) The expected utility of not starting the business is $-1/160,000$. The expected utility of starting the business is $-(1/360,000)p - (1/40,000)(1 - p)$. The person is indifferent if $(1/160,000) = (1/360,000)p + (1/40,000)(1 - p)$. Thus,

To start the business $p \geq 27/32 = 0.844$

(c) Who is more risk averse? (circle the correct answer)

The Person in (b)

The person in (b) needs a higher a higher success probability in order to be willing to start the project.

Question 8

(a) The expected utility of the lottery is 0.1(5) + 0.2(2) + 0.5 = 1.4.

The certainty equivalent of the lottery is 2.89

(b) Now suppose that the highest payoff is m instead of 25 Dollars. Then the expected utility of the lottery is $0.1m + 0.2(2) + 0.5 = 3$.

***m* = 441**