A. Multiple Choice (72 pts)

1. Suppose two economists are having a disagreement about an economic policy. Which of the following issues about this policy can be decided using positive (as opposed to normative) economics:
   A. Whether this policy causes the price of apples to increase.
   B. Whether this policy is good for the economy.
   C. Whether this policy is good for the two economists.
   D. Whether this policy is good for the citizens of the economy.
   E. All of the above.

2. Which of the following is the most likely result from a rise in a person's income:
   A. A shift to the right of the demand curve for an inferior good.
   B. A shift to the left of the supply curve for a complementary good.
   C. A shift to the right of the demand curve for a normal good.
   D. A shift to the right of the supply curve for an inferior good.
   E. A shift to the left of the demand curve for a substitute good.

3. Suppose the demand for a good increases. Which of the following is most likely to happen if the supply curve is very elastic?
   A. The quantity of the good sold will rise more than the price of the good.
   B. The revenue earned by the producers will fall.
   C. The new equilibrium will be at a point that has a greater elasticity of demand than the old equilibrium.
   D. The price of the good will rise more than the quantity of the good that is sold.
   E. The price of the good will decrease more than the quantity of the good that is sold.

4. Currently the price for barley is $4 a bushel (a record low). To help the farmers, the government promises that it will buy any barley that farmers can't sell at a price of $5 a bushel.
   A. This will waste resources because buyers will want to buy more than what farmers will want to produce.
   B. This will decrease consumer surplus.
   C. This will reduce waste because unsold barley will now be stored by the government.
   D. This is an example of a price ceiling.
   E. All of the above.

5. When there is a price floor (where the government does not buy the surplus), the more elastic the demand curve:
   A. The greater the decrease in the amount of the good produced.
   B. The smaller the dead weight loss.
   C. The greater the consumer surplus lost.
   D. The greater the producer surplus gained.
   E. The greater the cost to the government.

6. Not all taxi drivers have the same cost of production. Which of the following policies will reduce the dead weight loss, if the government insists on keeping a high price for taxi rides?
   A. Put a high tax on the sale of all licences between taxi companies.
   B. Let taxi companies freely sell their licences to all qualified taxi drivers.
   C. Use government inspectors to make sure that taxi companies meet high standards to justify the high prices.
   D. Give all taxi companies a subsidy equal to how much they paid to get their licence.
   E. Do not let taxi companies sell their licences to other companies.

7. Dan is maximizing his utility with respect to apples and bananas. If the price of apples is greater than the price of bananas,
   A. The marginal utility of the last apple bought will be greater than the marginal utility of the last banana bought.
   B. Dan will spend more money on apples than on bananas.
   C. The marginal utility of the last apple bought will be equal to the marginal utility of the last banana bought.
   D. Dan will buy more apples than bananas.
   E. Dan will buy more bananas than apples.
8. **E** At a certain point in X,Y space, the MRS is greater than the slope of the budget constraint. This means:

A. We can achieve the same utility for a lower income by buying more Y and less X. 
B. The slope of the isoquant is steeper than the slope of the isocost curve. 
C. We are to the right of the output expansion path. 
D. The substitution effect is greater than the income effect. 
E. The marginal utility of the last X consumed is greater than the marginal utility of the last Y consumed.

9. **C** Suppose Adam gets a pay raise. When we compare his old equilibrium with his new equilibrium in X,Y space, we can say that Adam:

A. Is at a new point on the same budget constraint as before. 
B. Is at a new point on the same indifferece curve as before. 
C. Is at a new point on the same income consumption curve as before. 
D. Is at a new point on the same price consumption curve as before. 
E. Is at a new point on the same demand curve for X.

10. **E** Suppose X is a normal good. If there is a decrease in the price of X:

A. The income effect will be an increase in X, but we can’t tell whether the substitution effect is up or down. 
B. The income effect will be an increase in X, but the substitution effect will be a decrease in X. 
C. Both the income effect and substitution effect will be a decrease in X. 
D. The income effect will be a decrease in X, but the substitution effect will be an increase in X. 
E. Both the income effect and substitution effect will be an increase in X.

11. **D** If the price of labour increases (Labour on the X-axis):

A. The marginal rate of technical substitution will decrease at every point in L,K space. 
B. The output expansion path will become flatter. 
C. The long run average cost curve will shift to the right. 
D. The isocost curve will become steeper. 
E. The isoquants will become steeper.

12. **B** Suppose the company you manage has enough time to adjust both labour and capital. Suppose the price you are offered is larger than minimum point on your short run average cost curve. You should:

A. Produce the X where short run average cost is equal to the price. 
B. Produce as much X as possible. (This could be infinity!) 
C. Produce the X where the short run average cost is equal to the long run average cost. 
D. Shut down. 
E. Produce the X where the short run marginal cost is equal to the price.

13. **E** Suppose you do not have enough time to change the number of machines that your company uses. You can only adjust the amount of labour. If you are offered a price that is smaller than the minimum point on your short run average cost curve, you should:

A. Produce X where the short run average cost is equal to the price. 
B. Produce as much X as possible. (This could be infinity!) 
C. Produce the X where the short run average cost is equal to the long run average cost. 
D. Shut down. 
E. Can’t tell if we should operate or shut down.

14. **D** How would you measure the fixed cost in a diagram of cost curves? Multiply X by:

A. The minimum point of the average variable cost curve. 
B. The distance between the marginal cost and the average cost. 
C. The distance between the marginal cost and the average variable cost. 
D. The distance between the average cost and the average variable cost. 
E. The minimum point of the short run average cost curve.
Suppose every firm in a perfectly competitive industry is making losses. What must be true as we move to the long run?

A. The marginal cost of producing X will rise.
B. The number of firms will increase.
C. The total amount of X produced by the industry will rise.
D. We will move further away from the output expansion path.
E. The average cost of producing X will rise.

If there is an increase in the fixed cost of producing X:

A. The shut down price will increase.
B. The marginal cost of producing X will increase.
C. The long run number of firms in a perfectly competitive industry will increase.
D. The break even price will increase.
E. All of the above.

Suppose a monopoly is maximizing profit. What must be true:

A. The marginal cost of producing X must be below the average cost.
B. The average cost of producing X must be below the marginal cost.
C. The marginal revenue of producing X must be above the average cost.
D. The average cost of producing X must be below the price.
E. None of the above are necessarily true.

Suppose a monopoly is maximizing profit where the average cost (on a U-shaped average cost curve) is less than the marginal cost. At this point:

A. The slope of the isoquant curve is greater than the slope of the isocost at this X.
B. The isoquant for this X crosses the short run K above the output expansion path.
C. The isoquant for this X crosses the short run K below the output expansion path.
D. The isoquant for this X crosses the short run K on the output expansion path.
E. The isoquant for this X is tangent to the isocost curve at this X.

B. Comparative Statics (20 pts) SHOW YOUR WORK!! Here is some information from the banana market:

PRICE: 1 3 4 5 7 10 etc.,
DESIRED CONSUMPTION: 12 29 59 1 5 17 etc.,
AVAILABLE PRODUCTION: -1 0 5 11 16 17 etc.,

\[ \frac{\partial d}{\partial P} = 4 - 4P \quad \frac{\partial r}{\partial P} = \frac{8}{8} \]
\[ \Omega^5 = 2 + 2P \quad \tilde{\omega} = 3 - 12 \]

1. Calculate the elasticity of supply at equilibrium. Is the curve elastic?
2. Calculate the elasticity of demand at P=$5 (not equilibrium). Is the curve elastic here?
3. Find the EXACT maximum revenue point (both P and Q) on the demand curve.

4. Complete the table below showing the effect of a $3 tax on bananas.

\[ \text{Pc} \quad \text{Pp} \quad \text{Qc} \quad \text{Qp} \quad \Delta CS \quad \Delta PS \quad \Delta GR \quad \text{DWL} \quad \text{P} \quad q \]

\[ 2.4 \quad 6.9 \quad 4 \quad 9 \quad \frac{\partial CS}{\partial \frac{1}{2}} = -11 \quad \frac{\partial PS}{\partial \frac{1}{2}} = 2 \quad \frac{\partial GR}{\partial \frac{1}{2}} = -22 \quad \text{DWL} = -6 \quad \text{P} = 9 \quad q = 8 \]

C. Utility (26 pts) Let U=4XY-2X, (MUx= 4Y - 2, MUy= 4X) I=$65, Px=$16, Py=$2

1. Find the equation for the ICC curve. \[ \frac{\partial Y}{\partial X} = \frac{4Y - 2}{4X} = 9 \]
2. Find equilibrium X, Y and U.
3. Let Px falls to $4. Find the equation for the new ICC curve.

\[ 2 \frac{Y - 2}{X} = 2 \]
4. Find the new equilibrium X, Y and U.

Hint: Solve for X first

6. Find the intermediate point (both X and Y) for the same happiness as in #2

Above but with P=4. (Hint: solve for X first)

\[ X = \frac{2}{P} \]

7. What was the equivalent loss of income that the rise in P brought?

8. Draw a rough diagram which includes both ICC curves, both equilibrium points, both budget constraints and both indifference curves. Then carefully mark the intermediate point (6) and clearly indicate the income and substitution effects.

Production (40 pts) Let X=(1/4)L^{1/2}K^{1/2}, MP_L=(1/8)L^{-1/2}K^{1/2}, MP_K=(1/8)L^{1/2}K^{-1/2}, w_L=$50, w_K=$2

\[ \frac{L}{2} = 25 \]  \[ K = 25L \]

\[ X = \frac{1}{4}L^{1/2}(5L^{1/2}) = \frac{1}{2}L^{3/2} \]

3. Complete the table below for the following points. Find the cheapest way to produce X=4 when

<table>
<thead>
<tr>
<th>POINT A</th>
<th>(K is free to vary)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>L</td>
</tr>
<tr>
<td>1.2</td>
<td>3.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POINT B</th>
<th>(K=100 in the short run)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>L</td>
</tr>
<tr>
<td>100</td>
<td>2.56</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POINT C</th>
<th>(K is free to vary)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>L</td>
</tr>
<tr>
<td>160</td>
<td>6.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POINT D</th>
<th>(K=100 in the short run)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>L</td>
</tr>
<tr>
<td>100</td>
<td>10.24</td>
</tr>
</tbody>
</table>

5. Finally, find the cheapest way to produce X when K=100. What is the X?

6. How much L do you hire? What is TC, AC and MC? Call this POINT E.

\[ L = 4 \]

7. Draw a diagram in L, K space showing ALL of the above five (5!!) points. Draw and label all the isoquants and isocost curves that go through these five points. Show the output expansion path and clearly mark ALL points A, B, C, D and E.

8. Draw a second diagram is Cost, X space showing ALL of the same five (5!!) points. Draw and label the short run and long run average cost and marginal cost curves. Clearly mark ALL the points A, B, C, D and E.
E. Industrial Structure (22 pts) Here is some cost information from manufacturing widgets:

\[ VC = 5X^2 - 10X + 45, \quad FC = 80, \quad Qd = 870 - 6P \]

\[ AC = \frac{5X^2 - 10X + 45}{X}, \quad MC = 10 - \frac{10}{X} \]

1. \( X = 11, \quad \pi = 110(X - \frac{10}{X}) \]

Suppose you were one firm operating in this perfectly competitive industry, how much X would you produce if P = $10? What is your maximum net gain?

\[ 33(P + \pi) = 570 - 6P \]

2. \( P = 90, \quad X = 10, \quad \pi = 90(10 - \frac{5}{10}) = 900 - \frac{450}{10} = 375 \]

Suppose there are 33 identically sized firms in this perfectly competitive industry. What is the equilibrium P, output per firm and net gain per firm?

3. \( X = 5, \quad P = 40, \quad \pi = \frac{650}{5} = 126 \]

If there is free entry from other identically sized firms into this industry. What is the long run price, output per firm and number of firms in the industry?

4. \( Q = 15, \quad P = \frac{442.5}{15} = 29.5, \quad \pi = 145 - \frac{145}{15} \]

If one firm became a monopoly (and it was stuck in the short run and forced to charge all customers the same price) what would be the monopoly's output, price and net gain?

F. Short Essay (20 pts) Choose only ONE of the following topics for a short (maximum 250 word essay). A properly labeled and explained diagram will help.

1. The government does not let BC Hydro sell electricity to the US unless all local (BC) consumers have all the electricity they want. The government also keeps the local price of electricity below the US price. Is this policy (keeping the local price below the US market price) good for BC? Explain.

2. In Vancouver, we have a few very large grocery chains (Safeway, Superstore, and Saveon are the largest chains). Do you think this industry (grocery stores) is more competitive than the dairy industry in BC? (There are 900 farms which have permission to sell milk to grocery stores in BC but you can’t get permission to sell milk unless you buy “quota” (i.e. a permit) and quota is very, very expensive) (HINT: in which industry are prices more likely to be considered low by international standards?) What makes an industry competitive? Explain.