A. Multiple Choice or Fill in the Blank (80 pts) Place answer (A, B, C, D, E) in the space on the test.

1. D) We are at equilibrium. Which of the following will increase the equilibrium quantity demanded for a good?
   A. We bring in a price floor above the equilibrium price. ✓
   B. The supply of the good decreases. ❌
   C. We bring in a price ceiling below the equilibrium price. ❌
   D. The price of a complement (in demand) decreases. ❌
   E. It is an inferior good and income increases. ✓

2. A) Good A has a negative cross elasticity:
   A. With B if a rise in the price of B causes the demand for A to decrease.
   B. With B if a rise in the price of B causes the demand for A to increase. ✓
   C. With B if a decrease in the price of B causes the demand for A to increase. ❌
   D. If an increase in income causes the demand for A to decrease.
   E. If a rise in the price means that the total revenue from sales of the good decreases.

3. D) Suppose the price of X rises and consumers end up spending more money on X. This means
   A. X is an inferior good.
   B. X is a normal good and this is what normally happens with a negatively sloped demand curve.
   C. We are at an elastic point on the demand curve for X.
   D. We are at an inelastic point on the demand for X.
   E. X must be a complement.

4. E) Suppose we pass a law to keep the price of a good below the market level. This will
   A. Increase the amount of the good that people buy.
   B. This will increase the demand for the good.
   C. This will decrease the supply of the good.
   D. This will increase the consumer surplus of all people who want to buy the good.
   E. This will decrease the revenue earned by sellers of the good.

5. D) The less elastic the supply:
   A. The greater the dead weight loss from a ceiling.
   B. The greater the dead weight loss from a tax. ✓
   C. The greater the dead weight loss from a subsidy. ❌
   D. The greater the dead weight loss from a price floor (if the government does not buy the surplus).
   E. The greater the government earnings from a ceiling. ❌

6. C) Which of the following is FALSE:
   A. In a state of scarcity, increasing your consumption of X will increase your utility. ✓
   B. At a point of satiation, marginal utility is positive. ❌
   C. People achieve their highest utility when the marginal utility is equal for the last unit of all goods consumed. ❌
   D. As consumption of a good increases, the marginal utility decreases. ✓
   E. If two goods are within a budget, utility will decrease whenever the price of a good they want to buy rises. ✓

7. E) A is maximizing his utility in choosing between A and B. If the marginal utility of the last A he bought is
   A. He is buying more As than Bs.
   B. He is buying more Bs as As.
   C. He is buying as many As as Bs.
   D. The price of A must be double the price of B.
   E. The price of B must be double the price of A.
8. **C** If the slope of the budget constraint becomes steeper:
   A. It means that the consumer has lost some income.
   B. The new maximum utility point will have a lower utility than the old maximum utility point.
   C. This could be caused by a decrease in the price of the good on the Y-axis.
   D. This could be caused by a decrease in the price of the good on the X-axis.
   E. For every point, the marginal utility of the good on the X axis must have increased.

9. **C** What is the name of the curve which connects all the combinations of two goods (X & Y) which provide the maximum utility as the price of X increases and decreases?
   A. A budget constraint.
   B. The demand curve.
   C. The price consumption curve.
   D. The output expansion path.
   E. An indifference curve.

10. **B** Suppose an ICC curve has a negative slope. (X on the X axis) Then:
    A. X must be a Giffen good.
    B. The substitution effect for a rise in the price of X will be in the opposite direction as the income effect.
    C. The income effect for a rise in the price of X will be larger than the substitution effect.
    D. The income effect for a rise in the price of X will be in the opposite direction of the price change.
    E. The demand for X must have a negative slope too.

11. **C** Constant returns to scale means:
    A. If we increase inputs by 10% then total cost will increase by more than 10%.
    B. If we increase inputs by 10% then total cost will increase by less than 10%.
    C. The long run MC and AC curves are equal.
    D. The long run supply curve has a positive slope. (the higher the price, the greater the quantity you want to produce)
    E. The minimum point on the short run average cost curve is above the long run average cost curve.

12. **C** What must be true if K=2 in the short run and we are on the output expansion path? (Assume CRS)
    A. At this point, the average cost is lower than the marginal cost.
    B. This is the "shut down" point.
    C. At this point the long run marginal cost is equal to the short run marginal cost.
    D. At this point the average variable cost is decreasing.
    E. At this point the short run marginal cost curve has a negative slope.

13. **B** Suppose K is fixed in the short run and the average product of labour peaks at L*. Then:
    A. At L*, total product of X is steepest.
    B. At L*, a line from the origin to X* on the total product curve is tangent to the total product curve.
    C. At X* (for that L*) the marginal cost is decreasing.
    D. At X* (for that L*), the average cost is at a minimum point.
    E. At L*, the marginal product will be increasing.

14. **C** If fixed cost increases (other things being equal)
    A. The shutdown price will be higher than before.
    B. The shutdown quantity will be higher than before.
    C. The breakeven price will be higher than before.
    D. The distance between the AFC and AC will increase.
    E. All of the above.

15. **D** When the marginal product (for a certain amount of L) is increasing:
    A. The average variable cost (for the corresponding amount of X) is increasing.
    B. The marginal cost (for the corresponding amount of X) is increasing.
    C. The average cost (for the corresponding amount of X) is increasing.
    D. The average fixed cost (for the corresponding amount of X) is decreasing.
    E. The average product (for the same amount of L) is decreasing.
What will likely happen if a company is making a loss in a perfectly competitive market?
A. The company should shut down to reduce losses.
B. Some companies will leave the market causing prices to rise so each company left will produce more X than before.
C. Larger companies in this market will have lower costs and will still be making a profit.
D. Each company will try to increase the K they use so they can reduce costs and still be competitive.
E. Each company will try to compete by making their product "different" from competitor's products.

Which gives
A. MC<AVC
B. MC<AC
C. AVC>AC
D. P<AC

8. In a perfectly competitive industry, when a firm is making no profit:
A. It should shut down.
B. It is operating on the OEP.
C. The long run MC must be greater than the short run MC.
D. The short run MC must be greater than the long run MC.
E. The price must be below the short run MC and long run MC.

In order to increase sales from 5 units to 6 units, the single price monopolist must drop the price from $8 to $7. What is the marginal revenue in this range?
A. $41
B. $20.5
C. $7.5
D. $3.75

Suppose a profit maximizing monopoly with K fixed in the short run is maximizing profit but profit is zero.
A. The monopoly is operating on the output expansion path.
B. For the output, average cost is greater than marginal cost.
C. For that output price is equal to marginal revenue.
D. We must be at an output that is greater than the minimum point on the average cost curve.
E. For that output, marginal revenue must be greater than marginal cost.

Comparative Statics (20 pts) Here is the market for tomatoes:

<table>
<thead>
<tr>
<th>PRICE PER UNIT</th>
<th>QUANTITY DEMANDED</th>
<th>QUANTITY SUPPLIED</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>6</td>
<td>2</td>
</tr>
</tbody>
</table>

1. Find the equilibrium quantity and price. Find the elasticities of demand and supply at equilibrium. Are the curves elastic or inelastic at equilibrium?

2. Complete a table showing what happens when government will give consumers a $3 subsidy for every unit they buy:

<table>
<thead>
<tr>
<th>Pc</th>
<th>Qc</th>
<th>Qp</th>
<th>P</th>
<th>ΔQs</th>
<th>ΔPs</th>
<th>ΔGR</th>
<th>ΔDWL</th>
</tr>
</thead>
<tbody>
<tr>
<td>66</td>
<td>69</td>
<td>62</td>
<td>62</td>
<td>56</td>
<td>53</td>
<td>59</td>
<td>62</td>
</tr>
</tbody>
</table>

3. Find a, b, c, d, e, and f for the curves: $
\begin{align*}
    a &= 80 - 3P \\
    b &= 8 + 6P \\
    c &= 6(56) = -86 \\
    d &= 65 \\
    e &= 6(56) = -86 \\
    f &= 62
\end{align*}$
5. Complete the table below showing the amount of X that is the lowest average cost method of producing X:

<table>
<thead>
<tr>
<th>POINT</th>
<th>K</th>
<th>L</th>
<th>TC</th>
<th>AC</th>
<th>MC</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>3</td>
<td>6</td>
<td>486</td>
<td>3588</td>
<td>1296</td>
</tr>
</tbody>
</table>

6. Draw a rough diagram showing all the appropriate isoquants, isocosts and the output expansion path showing how to Points A, B & C fit together. Clearly label all the isoquants, isocost, OEP and the points.

7. Draw a rough diagram showing tall the appropriate average and marginal cost curves (both long run and short run). Carefully label the curves and the points A, B & C.

8. If K=6 in the short run, how much X should you produce to maximize profit if \( P=6000 \)? How much profit will you make?

\[
\pi = (P-AC) \times Q = (6000 - 1296) \times 5 = 26520
\]
E. Industrial Structure (26pts)

Let \( TC = 3X^2 + 4X + 108 \), \( Q_d = 3032 - 8P \)

1. \( P = 64 \), \( X = 10 \) \( 7T = 640 - 448 = 192 \)
   In the short run there are 252 identically sized firms in this perfectly competitive industry. Find equilibrium price, quantity per firm and profit per firm.
   \( P = 3.86 \)

2. \( X_f = 6, P = 40 \) \( N = 452 \)
   Suppose there is free entry by as many identically sized firms as want to enter this perfectly competitive industry.

3. \( Q = 60, P = 37.15 \) \( T = 11142 \)
   If a monopoly gained control of this industry, what price would the firm set? How many units of \( X \) would the firm sell and how much profit would this monopoly make?

4. \( -457.47 + 11.142 - 48708 = (497, 025) \)
   Calculate the dead weight loss caused by the monopoly operating in the short run.

F. Short Essay (20 pts)

Choose one (1) of the following topics for a short (maximum 250 words) essay. Diagrams will help your essay.

1. Losses suffered by a tax are shared between buyer and seller depending on how elastic demand and supply curves are. Consider the new 15% tax placed on foreign buyers of Vancouver real estate. What do you know about the elasticity of demand for Vancouver real estate (from foreign buyers) and what do you know about the elasticity of supply from local sellers? So who is bearing most of the cost of this new tax on foreign buyers of local real estate? Buyers or sellers? Explain.

2. Commuters from North Surrey to Vancouver complain that the toll on the Port Mann bridge is too high ($3.15 per crossing for a small vehicle). Many drivers seem to have chosen to cross via the Pattullo bridge (an older smaller bridge for which there is no toll). Using the Port Mann bridge you can get to Vancouver in 35 minutes. Via the Pattullo bridge you add on an average of another 20 minutes and sometimes longer since it gets very congested during rush hours. Do you think the toll should be lowered? Why or why not?