A. Multiple choice (48 pts) (Place answers (A, B, C, D or E) ON TEST in the space provided.)

1. **a** The price of beer rises sharply, and chicken wings and beer are complementary goods. Which of the following will occur?
   a. Both the price of chicken wings and the quantity of chicken wings demanded will tend to fall.
   b. Both the price of chicken wings and the quantity of chicken wings demanded will tend to rise.
   c. The price of chicken wings will tend to rise and the quantity of chicken wings demanded will tend to fall.
   d. The price of chicken wings will tend to fall and the quantity of chicken wings demanded will tend to rise.
   e. None of the above

2. **e** Given a standard supply and demand diagram, which of the following statements is correct?
   a. If the demand curve shifts left and the supply curve shifts right, equilibrium price will rise.
   b. If the supply curve shifts right and the demand curve remains constant, equilibrium price will rise.
   c. If the supply curve shifts left and demand remains constant, equilibrium quantity will rise.
   d. If the demand curve shifts right and the supply curve shifts left, equilibrium price will fall.
   e. None of the above

3. **c** A demand curve for which any price-quantity combination yields the same total expenditure reveals a price elasticity of demand equal to
   a. infinity.
   b. zero.
   c. unity.
   d. some value greater than one but less than infinity.
   e. not enough information to know.

4. **c** Suppose you are shown two demand curves that are drawn on the same scale. One of the demand curves is steeper than the other. Which of the following could explain the difference in slopes?
   a. The steeper one has a higher income elasticity of demand.
   b. The flatter one is for a good with no close substitutes.
   c. The steeper one is short run and the flatter one is long run.
   d. The steeper one is probably the demand curve for a luxury good.
   e. It is not possible to compare the slopes of different demand curves.

5. **e** A price ceiling set above the equilibrium price will result in
   a. black markets.
   b. fewer exchanges.
   c. shortages.
   d. surpluses.
   e. none of the above.
6. Suppose Andrea has a job that pays her $25,000 per year (after taxes). She is considering quitting her job and going to university full time for four years. Tuition fees and books will cost $12,000 per year. Living expenses will cost $5,000 per year. What is the opportunity cost of Andrea's university degree?
   a. $120,000
   b. $148,000
   c. $100,000
   d. $168,000
   e. zero

7. If the legal beer-drinking age is raised from 18 to 21, the changes to the equilibrium price and quantity of beer will change such that
   a. price rises, quantity rises.
   b. price falls, quantity falls.
   c. price rises, quantity falls.
   d. price falls, quantity rises.
   e. no change in price or quantity occurs.

8. A point to the left of the budget line
   a. implies the household is paying above market prices for the goods in question.
   b. implies the household is paying below market prices for the goods in question.
   c. implies that the household is not spending all of its income on the goods in question.
   d. indicates consumption spending beyond current income.
   e. none of the above.

9. If money income is reduced by half, and the prices of all goods consumed by the household are reduced by half, the household's budget line will
   a. not change.
   b. shift inward.
   c. shift outward.
   d. become steeper.
   e. become flatter.

10. Consumers will bear a larger burden of a sales tax if
    a. both demand and supply are relatively inelastic.
    b. both demand and supply are relatively elastic.
    c. demand is relatively elastic and supply is relatively inelastic.
    d. demand is relatively inelastic and supply is relatively elastic.
    e. the tax is collected by firms rather than remitted directly to the government by consumers.

11. In deriving the market demand curve for a commodity we assume all of the following EXCEPT that
    a. the income of consumers is held constant.
    b. the tastes of the consumers are held constant.
    c. the price of the commodity is held constant.
    d. the prices of related commodities are held constant.
    e. the distribution of income of the consumers is held constant.

12. Assume that apples and oranges are substitute goods. Given the initial supply and demand curves for apples, a reduction in the price of oranges will tend to
    a. decrease the price of apples
    b. increase the demand for apples.
    c. increase the demand for oranges.
    d. decrease the demand for oranges.
    e. increase the price of apples.
B. (24 pts) (SHOW YOUR WORK) Here is the market for cashew nuts:

<table>
<thead>
<tr>
<th>Price per unit</th>
<th>0</th>
<th>4</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity Demanded</td>
<td>40</td>
<td>24</td>
<td>8</td>
</tr>
<tr>
<td>Quantity Supplied</td>
<td>10</td>
<td>18</td>
<td>26</td>
</tr>
</tbody>
</table>

(a) Find the equation for demand.

\[ Q^d = 40 - 4P \quad \text{or} \quad P = 10 - \frac{Q^d}{4} \]

\[ Q^c = 10 + 2P \quad \text{or} \quad P = \frac{Q^c}{2} - 5 \]

(b) Find the elasticity of supply when P=10. Is the curve elastic here?

\[ \eta_s = \frac{dQ^s}{dP} \cdot \frac{P}{Q^s} = 2 \cdot \frac{10}{10 + 2 \times 10} = \frac{20}{30} = \frac{2}{3} \]

The curve is inelastic.

(c) At which point on the demand curve will the total revenue reach its maximum?

\[ P = 5, \quad Q = 20 \]

\[ \eta = \frac{dQ^d}{dP} \cdot \frac{P}{Q} = 4 \cdot \frac{P}{Q} = 1 \quad \Rightarrow \quad Q = 4P \]

\[ 8P = 40 \]

\[ P = 5, \quad Q = 20 \]

(d) When the price of peanuts falls by 10%, the demand for cashew shifts to \( Q^d = 34 - 4P \). What is the cross elasticity between cashew nuts and peanuts? What is the economic term we use for an economic good which has this cross elasticity?

\[ P = \frac{34}{4} - \frac{Q^d}{4} \]

\[ 34 - 4P = 10 + 2P \]

\[ 6P = 24 \]

\[ P = 4 \]

\[ Q = 18 \]

\[ \eta_{xy} = \frac{18 - 20}{20} \cdot \frac{-10\%}{-0.1} = -0.1 \]

\[ 0 > 0 \quad \Rightarrow \quad \text{substitutes} \]

\[ 2 \]
C. (28 pts) SHOW YOUR WORK!!! Complete the table below showing the results of the following two policies (Use the demand and supply curves from part B)

Plan A: The government gives a $4.50 subsidy to consumer.
Plan B: The government should buy all the available production at a price of $8.

<table>
<thead>
<tr>
<th>Plan</th>
<th>Pc</th>
<th>Ps</th>
<th>Qc</th>
<th>Qs</th>
<th>ΔCS</th>
<th>ΔPS</th>
<th>ΔGR</th>
<th>DWL</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>3.5</td>
<td>8</td>
<td>26</td>
<td>26</td>
<td>54.5</td>
<td>69</td>
<td>-117</td>
<td>-13.5</td>
</tr>
<tr>
<td>B</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>26</td>
<td>-42</td>
<td>69</td>
<td>-144</td>
<td>-17</td>
</tr>
</tbody>
</table>

Briefly comment on which policy do you think is better? And why?

**Plan A:**

\[ P = 4.5 = 10 - \frac{Q}{4} \]
\[ Q^d = 58 - 4P \]
\[ 58 - 4P = 10 + 2P \quad \Rightarrow \quad P = 8 \]
\[ Q^d = 58 - 4 \times 8 = 26 \]
\[ \Delta CS = \frac{1}{2} \times (20 + 26) \times 1.5 = 34.5 \]
\[ \Delta PS = \frac{1}{2} \times (20 + 26) \times 3 = 69 \]
\[ \Delta GR = -26 \times 4.5 = -117 \]
\[ DWL = 34.5 + 69 - 117 = -13.5 \text{ or } \frac{1}{2} \times 4.5 \times 6 = 13.5 \]

**Plan B:**

\[ Q^d = 40 - 3.2 = 8 \]
\[ Q^s = 10 + 16 = 26 \]
\[ \Delta CS = \frac{1}{2} \times (8 + 20) \times 3 = -42 \]
\[ \Delta PS = \frac{1}{2} \times (20 + 26) \times 3 = 69 \]
\[ \Delta GR = 18 \times 8 = -144 \]
\[ DWL = -117 \]

Check: \[ 18 \times 8 \frac{1}{2} \times 18 \times 3 = 144 - 27 = -117 \]