1. In order to spur consumer spending in 1998, the Japanese government considered an $85 billion check system whereby every Japanese consumer would receive a shopping check that could be used to purchase Japanese products. For simplicity, assume the following: each consumer has wealth of 1 million yen, consumers must allocate this wealth between consumption now ($C_1$) and consumption later ($C_2$), the interest rate is zero, the check is worth 100,000 yen, and it can be spent only in the current period. If it is not spent, it is lost.

   a. Plot a budget line for a representative consumer both before and after the check program.
   b. Do you expect that current consumption of a typical consumer will increase by the full 100,000 yen of the check? Explain.
   c. How does the impact of this 100,000-yen check differ from simply giving the individual 100,000 yen?

2. The AMT Company faces a linear demand curve. Currently, it is selling at a price and quantity where its demand elasticity is 1.5. Consultants have suggested that the company expand output because it is facing an elastic demand curve. Do you agree with this recommendation? Explain.

3. The W Company employs 100 high school graduates and 50 college graduates at respective wages of $10 and $20. The total product for high school graduates is $1,000 + 100 Q_H$, whereas the total product for college graduates is $5,000 + 50 Q_C$. $Q_H$ = the number of high school graduates, while $Q_C$ = the number of college graduates. Is the company hiring the optimal amount of each type of worker? If not, has it hired too many high school or too many college graduates? Explain.

4. Ms. Caffeine enjoys coffee ($C$) and tea ($T$) according to the utility function $U(C, T) = 3C + 4T$.
   a. What does her utility function say about her marginal rate of substitution (MRS) of Coffee for tea?
   b. What do her indifference curves look like?
   c. If coffee and tea cost $3 each and Ms. Caffeine has $12 to spend on these products, how much coffee and tea should she buy to maximize her utility?
   d. How would her consumption change if the price of coffee fell to $2?
5. The supply side of an economy is given by a production function:

\[ y = 80 + 12n - \frac{n^2}{8}, \]

where \( y \) is the amount of output and \( n \) is labor input. The labor supply \( (n^s) \) is:

\[ n^s = 10 + 4 \frac{w}{p}, \]

where \( w \) is the nominal wage rate and \( p \) is the general price level. Assume producers are profit maximizing and the total labor force in this economy is 30.

a. What is the natural rate of unemployment?

b. Assume the price level is 1. Suppose the government imposes an employment tax of $1 per worker, and also a tax on labor income that shifts the labor supply curve to \( n^s = 6 + 4 \frac{w}{p} \).

What is the new equilibrium employment?

c. What is the new equilibrium amount of output?

6. Assume the industry demand for a product is: \( P=1,000-20Q \). Assume that the marginal cost of product is $10 per unit.

a. What price and output will occur under pure competition?

b. What price and output will occur under pure monopoly (assume one price is charged to all customers)?

c. Draw a graph that shows the lost gains from trade that result from having a monopoly.

7. An entrepreneur purchases two firms to produce widgets. Each firm produces identical products and each has a production function given by

\[ q_i = K_i^{0.5} L_i^{0.5}, \quad i = 1, 2. \]

The firms differ, however, in the amount of capital equipment each has. In particular, firm 1 has \( K_1 = 25 \), whereas firm 2 has \( K_2 = 100 \).

a. What are the marginal products of labor for each firm?

b. Rental rates for \( K \) and \( L \) are given by \( w = v = $1 \). If the entrepreneur wishes to minimize short-run total costs of widget production, how should output be allocated between the two firms?

c. Calculate the short-run total and average cost curves.
8. Consider an economy with the following data:

<table>
<thead>
<tr>
<th>Economic Indicator</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross National Product</td>
<td>$5,000 Billion</td>
</tr>
<tr>
<td>Personal Consumption Expenditure</td>
<td>3,500 Billion</td>
</tr>
<tr>
<td>Exports</td>
<td>500 Billion</td>
</tr>
<tr>
<td>Government Purchases</td>
<td>900 Billion</td>
</tr>
<tr>
<td>Net Private Domestic Investment</td>
<td>300 Billion</td>
</tr>
<tr>
<td>Disposable Personal Income</td>
<td>3,700 Billion</td>
</tr>
<tr>
<td>National Income</td>
<td>4,000 Billion</td>
</tr>
<tr>
<td>Gross Private Domestic Investment</td>
<td>350 Billion</td>
</tr>
<tr>
<td>Personal Tax Payments</td>
<td>600 Billion</td>
</tr>
</tbody>
</table>

Find the values of
a. Net National Product,
b. Personal Income,
c. Imports.

9. A person has an expected utility function of the form $u(w) = \sqrt{w}$. He initially has a wealth of $16. He has a lottery ticket that will be worth $20 with probability 1/2 and will be worth $0 with probability 1/2.

a. What is his expected utility?
b. What is the lowest price $p$ at which he would part with the ticket?

10. Suppose we assume a production function of the form

$$Y = F(K, N)$$

where $K$ and $N$ denote the inputs of capital and labor. Assume this production function obeys constant returns to scale and diminishing returns to each factor. And the factor markets are competitive. Suppose the share of capital in income is 0.4. Capital grows by 6 percent, and labor supply declines by 2 percent.

a. What happens to output?
b. What is the growth rate of output per capita?