1. Markets (2 points each)

1a. Which panel represents the changes in the market for chicken when farmers use hormones to increase the production of chicken, but consumers are concerned about eating the chicken?
   A) A    B) B    C) C    D) D
   Ans: B

1b. Which panel represents the changes in the market for parking spaces when the student population increases on a college campus and one parking lot has been destroyed to build a new building?
   A) A    B) B    C) C    D) D
   Ans: C

1c. Which panel represents the changes in the market for sugar when a drought reduces the sugar crop and sugar substitutes become more popular?
   A) A    B) B    C) C    D) D
   Ans: D
2. Demand (2 points each) (2 points each)

The following is a hypothetical demand schedule for automobiles.

<table>
<thead>
<tr>
<th>Price of new autos (dollars per auto)</th>
<th>Number of new autos (millions per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$24,000</td>
<td>2</td>
</tr>
<tr>
<td>$20,000</td>
<td>4</td>
</tr>
</tbody>
</table>

2a. What is the total revenue from automobile sales at a price of $24,000 per auto?
   A) $12 billion per year.  
   B) $26 billion per year.  
   C) $44 billion per year.  
   D) $48 billion per year.  

   Ans:  D

2b. As price decreases from $24,000 per car to $20,000 per car:
   A) The demand curve for cars shifts to the right.  
   B) Total revenue increases.  
   C) The quantity of cars demanded decreases.  
   D) The supply curve for cars shifts to the left.  

   Ans:  B

2c. Using the total revenue rule, describe the price elasticity of demand for new automobiles. Briefly explain your answer.

   Use TR rule:

   if TR increases as P decreases, elastic (very sensitive to lower price, buy lots more)
   if TR decreases as P decreases, inelastic (not sensitive to lower price, do not buy much more)

   Therefore, since TR increases when the price of an automobile decreases to $20,000, demand is price elastic.

2d. The price of fresh salmon fell from $25/lb to $20/lb, causing an increase in quantity demanded of 60 lbs to 80 lbs. What is the price elasticity of demand for fresh salmon in this market, and what happens to total revenue? Please calculate the precise elasticity and show your work.

   E = 1.29, total revenue increases.
3. Production (2 points each)

3a. The marginal physical product of the second unit of labor is:
   Ans: C

3b. The marginal physical product of the fourth unit of labor is:
   Ans: A

3c. The marginal physical product of labor is negative for the:
   Ans: D

3d. Explain the law of diminishing returns (diminishing MPP).

After gains from specialization have been earned, each additional worker adds less than the previous since all other inputs (land, capital, entrepreneurship) are fixed. There are only a limited number of tasks that can be done at once, and only so much raw material for example, so additional workers add less than the initial ones.
4. Production costs (2 points each)

This table shows the total cost of producing yearbooks using a school's print shop.

<table>
<thead>
<tr>
<th>Number of yearbooks</th>
<th>100</th>
<th>200</th>
<th>300</th>
<th>400</th>
<th>500</th>
<th>600</th>
</tr>
</thead>
<tbody>
<tr>
<td>School print shop cost ($/year)</td>
<td>1,200</td>
<td>1,600</td>
<td>1,800</td>
<td>2,200</td>
<td>3,000</td>
<td>4,800</td>
</tr>
</tbody>
</table>

4a. The production rate at which the lowest possible average total cost for yearbooks is achieved would be:
   A) 200 yearbooks per year.  
   B) 300 yearbooks per year.  
   C) 400 yearbooks per year.  
   D) 500 yearbooks per year.  
   Ans: C

4b. Marginal cost per yearbook, between 100 and 200 yearbooks is equal to:
   A) $400.  
   B) $4.  
   C) $16.  
   D) $12.  
   Ans: B

4c. The marginal cost is at a minimum when:
   A) The first 100 units are produced.  
   B) Output increases from 300 units to 400 units.  
   C) Output increases from 100 units to 200 units.  
   D) Output increases from 200 units to 300 units.  
   Ans: D
5. **Market Structure (6 points)**

5a. **Competition**

With the aid of two graphs, and using the relationship between price and average total cost, illustrate and describe long-run equilibrium for competitive markets.

3 points for individual firm graph (show production at P=MC, profit if P>ATC, loss if P<ATC)

3 points for market graph (entry if profit, exit if loss, long-run equilibrium is zero profit, P=ATC)
6. **Competition vs. Monopoly (2 points each)**

![Graph of Demand and Average Cost]

**6a.** The profit-maximizing level of output for a monopolist is:
- A) 2 units.
- B) 3 units.
- C) 4 units.
- D) Between 3 and 4 units.

Ans: B

**6b.** The price charged by a profit-maximizing monopolist is:
- A) $5.00.
- B) $7.00.
- C) $9.00.
- D) Between $6.00 and $7.00.

Ans: B

**6c.** If this industry is competitive, the profit-maximizing level of output is:
- A) 2 units.
- B) 3 units.
- C) 4 units.
- D) Between 3 and 4 units.

Ans: D

**6d.** If this industry is competitive, the profit-maximizing price is:
- A) $5.00.
- B) $7.00.
- C) $9.00.
- D) Between $6.00 and $7.00.

Ans: D
7. Factor markets: Labor (2 points each 7a and 7b; 4 points 7c)

7a. At equilibrium, ____ workers are employed and ____ workers are unemployed.
   A) 48; 28.  B) 68; 28.  C) 48; 0.  D) 68; 0.
   Ans: D

7b. A minimum wage of $20 will result in a:
   A) Surplus of 56 workers.  C) Surplus of 28 workers.
   B) Shortage of 56 workers.  D) Shortage of 28 workers.
   Ans: A

7c. Describe the “winners” and the “losers” from the minimum wage policy above. Please be specific (how many winners, how many losers, and how they won and lost from the policy).

   Winners: 40 workers who kept their job and are making higher wage
   Losers: 56 workers: 28 lost their job, 28 willing to work but cannot find a job
8. Externalities (2 points each)

This table contains data on the social costs and benefits incurred in improving water quality in a lake. Complete the table and answer the question(s) below.

Costs of reducing water pollution

<table>
<thead>
<tr>
<th>Water pollution (PPM)</th>
<th>45</th>
<th>35</th>
<th>25</th>
<th>10</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social benefit (dollars)</td>
<td>120</td>
<td>190</td>
<td>240</td>
<td>270</td>
<td>280</td>
</tr>
<tr>
<td>Social cost (dollars)</td>
<td>20</td>
<td>25</td>
<td>35</td>
<td>65</td>
<td>100</td>
</tr>
</tbody>
</table>

Marginal social benefit (dollars per PPM) ___ ___ ___ ___ ___
Marginal social cost (dollars per PPM) ___ ___ ___ ___ ___

8a. What is the marginal social benefit (in dollars per PPM) of reducing pollution rates from 35 to 25 PPM?
   Ans: A

8b. What is the marginal social cost (in dollars per PPM) of reducing pollution rates from 25 to 10 PPM?
   Ans: D

8c. Which of the following explains why the lake should not be made entirely free of pollution?
   A) Society cannot clean up the lake.
   B) There would be no benefit in making the lake completely clean.
   C) The total social cost would exceed the total social benefit of completely cleaning the lake.
   D) The marginal social costs of reaching 0 PPM are greater than the marginal social benefits from doing so.
   Ans: D
9. Aggregate supply and demand (2 points each)

9a. At what price level does equilibrium occur?
   A) $P_1$,  B) $P_2$,  C) $P_3$,  D) $P_4$.
   Ans: B

9b. At which of the following price levels would a shortage occur?
   A) $P_1$,  B) $P_2$,  C) $P_3$,  D) $P_4$.
   Ans: A

9c. Given that equilibrium occurs at a real output of $Q_4$, then full-employment GDP:
   A) Must be at the output level of $Q_4$.  C) Must be at some output level above $Q_4$.
   B) Must be at some output level below $Q_4$.  D) Can be at any output level.
   Ans: D

9d. If consumers lose confidence in the economy and reduce their spending, the new equilibrium is likely to occur at:
   A) $P_2$ and $Q_2$.  B) $P_1$ and $Q_2$.  C) $P_3$ and $Q_3$.  D) $P_2$ and $Q_4$.
   Ans: B
10. Income and consumption (2 points each)

The following table shows a hypothetical relationship between consumption and income. Answer the indicated question(s) on the basis of this table.

Income and consumption data

\[
\begin{array}{ccc}
\text{Disposable income} & \text{Total consumption} & \text{Savings} \\
\text{(\$ billions/year)} & \text{(\$ billions/year)} & \text{(\$ billions/year)} \\
100 & 85 & \\
200 & 165 & \\
\end{array}
\]

10a. What is the marginal propensity to consume?
   A) 0.60. B) 0.75. C) 0.80. D) 0.85.
   Ans: C

10b. What is the marginal propensity to save?
   A) 0.30. B) 0.25. C) 0.20. D) 0.15.
   Ans: C

10c. What is the multiplier?
   A) 0.85. B) 0.80. C) 4. D) 5.
   Ans: D

10d. What is saving at a disposable income of $100 billion per year?
   A) $0 billion per year. B) $15 billion per year. C) $30 billion per year. D) $35 billion per year.
   Ans: B

10e. What would the level of consumption be if disposable income equaled $300 billion?
   A) $300. B) $245. C) $225. D) $80.
   Ans: B
11. Fiscal policy (2 points each)

**Diagram:**

- **AD₃** and **AD₂** represent different levels of aggregate demand.
- **AD₁** is a higher level of aggregate demand than **AD₂**.
- The real output is measured in trillions of dollars per year.
- The price level is measured as the average price.
- **Qₑ** represents real output, and **Pₑ** represents the price level.
- The graph shows the economy at different price levels and real output levels.
- The *x*-axis represents real output (trillions of dollars per year), and the *y*-axis represents the price level (average price).

11a. Assuming aggregate demand is represented by **AD₃**, the economy confronts a real GDP gap of:
   - A) Zero.
   - B) $400 billion.
   - C) $520 billion.
   - D) $560 billion.

   Ans: A

11b. Assume aggregate demand is represented by **AD₁**. Which of the following could cause a shift to **AD₂**?
   - A) A decrease in government spending on goods and services.
   - B) An increase in taxes.
   - C) A decrease in consumer spending.
   - D) All of the above.

   Ans: D

11c. Assume aggregate demand is represented by **AD₃**. Which of the following could cause a shift to **AD₂**?
   - A) An increase in government spending on goods and services.
   - B) An increase in taxes.
   - C) A decrease in consumer confidence.
   - D) A decrease in investment spending.

   Ans: A

11d. Assume aggregate demand is represented by **AD₂**. Which of the following could cause a shift to **AD₁**?
   - A) A decrease in government spending on goods and services.
   - B) A decrease in taxes.
   - C) A decrease in investment spending.
   - D) All of the above.

   Ans: B
12. Money and banking (2 points each)

Use the following balance sheet for XYZ Bank, which is one of many banks in a banking system.

XYZ Bank balance sheet

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total reserves</td>
<td>$ 50,000</td>
</tr>
<tr>
<td>Transactions accounts</td>
<td>$200,000</td>
</tr>
<tr>
<td>Other assets</td>
<td>150,000</td>
</tr>
</tbody>
</table>

12a. With a required reserve ratio of 15 percent, XYZ Bank would have excess reserves of:
A) $15,000.  B) $20,000.  C) $50,000.  D) $150,000.
Ans: B

12b. If XYZ Bank has a required reserve ratio of 20 percent, it can legally increase its loans by:
A) $10,000.  B) $20,000.  C) $40,000.  D) $50,000.
Ans: A

12c. With total reserves of $50,000 and a required reserve ratio of 10 percent, potential deposit creation for the banking system is equal to:
A) $20,000.  B) $50,000.  C) $80,000.  D) $300,000.
Ans: D

12d. With total reserves of $50,000 and a required reserve ratio of 25 percent, potential deposit creation for the banking system is equal to:
A) $50,000.  B) Zero.  C) $200,000.  D) $250,000.
Ans: B
13. Monetary policy (2 points each)

Answer the indicated questions on the basis of the information in the table below.

Monetary data

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash held by the public</td>
<td>$100 billion</td>
</tr>
<tr>
<td>Transactions account balances</td>
<td>$600 billion</td>
</tr>
<tr>
<td>Required reserves</td>
<td>$72 billion</td>
</tr>
<tr>
<td>Excess reserves</td>
<td>$0</td>
</tr>
<tr>
<td>U.S. Treasury bonds held by the public</td>
<td>$500 billion</td>
</tr>
</tbody>
</table>

13a. Considering only the information the in table above, the basic money supply is:
   A) $600 billion. B) $672 billion. C) $700 billion. D) $772 billion.
   Ans: C

13b. Based on the information in the table above, the required reserve ratio is:
   A) 7 percent. B) 12 percent. C) 17 percent. D) 83 percent.
   Ans: B

13c. If the Fed changes the required reserve ratio to 5 percent, the lending capacity of the banking system will eventually:
   A) Rise by $840 billion. B) Fall by $840 billion. C) Rise by $42 billion. D) Fall by $42 billion.
   Ans: A
14. **International trade (2 points each)**

Assume Russia and the United States each produce only two goods, tanks and automobiles. The values in the table below represent the maximum amount of each good that can be produced using existing resources.

<table>
<thead>
<tr>
<th>Country</th>
<th>Tanks</th>
<th>Automobiles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Russia</td>
<td>100</td>
<td>400</td>
</tr>
<tr>
<td>United States</td>
<td>200</td>
<td>400</td>
</tr>
</tbody>
</table>

14a. The opportunity cost of producing 1 tank in the United States is:
   A) $\frac{1}{2}$ of an automobile.  B) 1 automobile.  C) 2 automobiles.  D) 3 automobiles.
   Ans: C

14b. The opportunity cost of producing 1 tank in Russia is:
   A) $\frac{1}{4}$ of an automobile.  B) 1 automobile.  C) 2 automobiles.  D) 4 automobiles.
   Ans: D

14c. Based on the opportunity cost implied in the table:
   A) The Russia should specialize in the production of tanks.
   B) Russia should specialize in the production of automobiles.
   C) The United States should specialize in the production of automobiles.
   D) Neither country will benefit from trade.
   Ans: B

14d. The output of automobiles and tanks will increase if:
   A) Russia specializes in producing tanks, and the United States specializes in producing automobiles.
   B) Both countries attempt to become self-sufficient.
   C) Russia specializes in producing automobiles, while the United States specializes in producing tanks.
   D) The United States produces both goods and exports them to Russia.
   Ans: C

14e. Based on the information above, it is clear that in order for trade to be mutually beneficial for both countries, the limits of the terms of trade will be such that 1 tank will exchange for:
   A) More than 2 units of automobiles but less than 4 units.
   B) More than $\frac{1}{2}$ units of automobiles but less than $\frac{1}{4}$ units.
   C) Less than 2 units of automobiles.
   D) A negative amount of automobiles.
   Ans: A
15. Gains from trade (2 points each)

Suppose the United States and Japan each produce only two goods and have the production possibilities shown in the figures below. Without trade, Japan produces at point A and the United States produces at point B. Use the figure to answer the question(s) below.

15a. What is the opportunity cost of a DVD player in Japan?
   A) 1/2 of a motorcycle per DVD player.  
   B) 1 motorcycle per DVD player.  
   C) 2 motorcycles per DVD player.  
   D) 1/3 of a motorcycle per DVD player.  
   Ans: C

15b. What is the opportunity cost of a motorcycle in Japan?
   A) 1/2 of a DVD player per motorcycle.  
   B) 1 DVD player per motorcycle.  
   C) 2 DVD players per motorcycle.  
   D) 3 DVD players per motorcycle.  
   Ans: A

15c. Which of the following best describes the comparative advantage of the two countries?
   A) Japan has a comparative advantage in both goods.  
   B) Japan has the comparative advantage in DVD players; the United States in motorcycles.  
   C) Japan has the comparative advantage in motorcycles; the United States in DVD players.  
   D) The United States has a comparative advantage in both goods.  
   Ans: C
16. Barriers to trade (8 points)

Through the use of a well-labeled graph (or four), illustrate and clearly explain the impacts (how many imports, prices, quantity supplied and demanded) of tariffs, and then those of quotas. Be sure to start with the “no trade” and “free trade” equilibriums.