DO NOT BEGIN WORKING UNTIL THE INSTRUCTOR TELLS YOU TO DO SO READ THESE INSTRUCTIONS FIRST.

You have 50 minutes to complete the exam, including filling in your scantron. The exam consists of 10 binary choice questions worth 2 points each and 19 multiple choice questions worth 4 points each. Please accurately and completely provide your name, ID number, discussion section number, version number, and TA name on the scantron sheet and the exam booklet. Writing all this information correctly is worth 4 points. Answer all questions on the scantron sheet with a #2 pencil. There are 15 printed pages in this exam, including this cover sheet. DO NOT PULL THE EXAM APART OR REMOVE THE STAPLE.

WARNING: NO COMMUNICATION OR CALCULATING DEVICES, OR FORMULA SHEETS ARE ALLOWED. NO CONSULTATION AND CONVERSATION WITH OTHERS ARE ALLOWED WHILE YOU ARE TAKING THE EXAM OR IN THE EXAM ROOM. ACADEMIC MISCONDUCT IS A SERIOUS OFFENSE AND PUNISHABLE TO THE FULLEST EXTENT. PICK THE BEST ANSWER FOR EACH QUESTION.

How to fill in the scantron sheet and other information:
1. Print your last name, first name, and middle initial in the spaces marked "Last Name," "First Name," and "MI." Fill in the corresponding bubbles below.
2. Print your student ID number in the space marked "Identification Number." Fill in the bubbles.
3. Write the number of the discussion section you've been attending under "Special Codes" spaces ABC, and fill in the bubbles. At the bottom of this page you will find the discussion numbers.
4. Write the version number of your exam booklet under "Special Codes" space D, and fill in the bubble. The version number is at the top of this page.

- If there is an error on the exam or you do not understand something, make a note on your exam booklet and the issue will be addressed AFTER the examination is complete. No questions regarding the exam can be addressed while the exam is being administered.
- When you are finished, please get up quietly and bring your scantron sheet and this exam booklet to the place indicated by the instructors.
I, ______________________, agree to neither give nor receive any help on this exam from others. I understand that the use of a calculator or communication device on this exam is academic misconduct. I also understand that providing answers to questions on this exam to other students is academic misconduct, as is taking or receiving answers to questions on this exam from other students. Thus, I will cover my answers and not expose my answers to other students. It is important to me to be a person of integrity and that means ALL ANSWERS on this exam are my answers. Any violation of these guidelines will result in a penalty of at least receiving a zero on this exam.

Signed ______________________

Binary Choice (worth 2 points each)

1) Which of the following statements is a normative statement?  
   a. Government-provided healthcare increases public expenditures.  
   b. Government should provide basic healthcare to all citizens.

2) What do we call data on the 2015 income of 100 million households?  
   a. Cross-sectional data  
   b. Time-series data

3) You are the fourth tallest person in a group of 20 students. That means you are at the:  
   a. 20th percentile  
   b. 80th percentile

4) The determining factors behind the central bank's interest rate policy is investigated primarily in:  
   a. Microeconomics  
   b. Macroeconomics

5) In the circular flow diagram, factors of production include:  
   a. Land, Labor and Capital  
   b. Goods and Services
6) Arik and Joseph produce only bread and milk. Arik has the comparative advantage over Joseph in the production of bread while Joseph has the comparative advantage over Arik in the production of milk. Given that there is NO trade between these two individuals, and that Arik and Joseph currently produce both of these two goods, we can conclude that their joint production is:

- efficient
- not efficient

They could expand their total production by specializing according to comparative advantage, then trading with one another.

7) Consider a market with 4 consumers. The demand curve for each of these consumers is given by the following equations where P is the price per unit in dollars and Q is the quantity of the good:

Consumer 1: \[ P = 10 - Q_1 \]
Consumer 2: \[ P = 15 - Q_2 \]
Consumer 3: \[ P = 5 - Q_3 \]
Consumer 4: \[ P = 20 - Q_4 \]

Given the above information and holding everything else constant, the slope of the aggregate demand curve when the price is between $5 and $10 is:

- a. -1/2
- b. -1/3

8) Suppose that a country currently imports 100 cars per month. The imposition of an import quota of 50 cars per month will, holding everything else constant, cause the country's price for a car to be:

- above the world price.
- below the world price.

9) Consider the United States market for oil that is initially in equilibrium. Suppose people in the United States expect their future incomes to decrease and that oil is a normal good. Then, given this information and holding everything else constant, in a graph of demand and supply we should see:

- A movement along the supply curve.
- A shift of the supply curve.

10) Suppose that in an economy there is an increase in the consumption of imported goods. Given this information and holding everything else constant, then in this economy:

- a. GDP will decrease.
- b. This change will have no effect on GDP.

\[ GDP = C + I + G + (X - IM) \]

If IM increases by $10, so does C, so net effect on GDP is zero!
(This page is intentionally left blank as an extra work sheet.)
DO NOT DETACH THIS SHEET FROM THIS EXAM BOOKLET!
EXAM CONTINUES ON NEXT PAGE

\[ Q_T \text{ in } P \text{ between } 5 \text{ and } 10: \]

\[ Q_T = Q_1 + Q_2 + Q_4 \]

\[ = \left[ 10 - p \right] + \left[ 15 - p \right] + \left[ 20 - p \right] \]

\[ = 45 - 3p \]

\[ 3p = 45 - Q \]

\[ p = 15 - \frac{1}{3}Q \Rightarrow m = -\frac{1}{3} \]
Multiple Choice (worth 4 points each)

11) Which of the following statements might be scientifically tested using time series data?

I. Output and unemployment tend to move together. Yes
II. Higher income allows people to satisfy their needs better and one would expect that consumption levels of goods and services would be higher in richer countries at a given point in time. No: not looking at data over time
III. Free lunches improve individual student performance. Yes
IV. Average economic growth rates of US declined over time compare to other OECD countries. Yes

a. I only
b. I and III
c. I, III, and IV
d. I, II, III, and IV

12) The figure below is the Quintile Shares of Total Income 1993-2013 that is created based on data from the U.S. Census Bureau. According to this figure, which of the following statements is NOT true?

Share of Total Household Income (%)

<table>
<thead>
<tr>
<th>Year</th>
<th>Bottom Quintile</th>
<th>2nd Quintile</th>
<th>3rd Quintile</th>
<th>4th Quintile</th>
<th>Top Quintile</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>3.6%</td>
<td>15.1%</td>
<td>23.5%</td>
<td>42.9%</td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td>3.4%</td>
<td>14.8%</td>
<td>23.4%</td>
<td>40.8%</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>3.2%</td>
<td>14.4%</td>
<td>25%</td>
<td>31%</td>
<td></td>
</tr>
</tbody>
</table>

a. The graph compares quintile income shares across 1993, 2003 and 2013. True
b. It reveals growing concentration of U.S. household income at the top of the distribution. True 48.4% to 49.8% to 51%
c. The shares of total income held by the four lowest quintiles fell between 1993 and 2003. True
d. The shares of total income held by the four highest quintiles fell between 2003 and 2013. False
13) Eric needs to solve the 462 problems in the Econ 102 textbook. Suppose the relationship for Eric between hours spent solving questions and the number of questions solved is linear. You also know the following information: yesterday, Eric spent 2 hours solving 44 problems and today, he solved 176 problems in 8 hours. If he continues to solve the problems at the same rate, how many additional hours will it take for Eric to solve all the problems in the textbook?

- a. 11 hours
- b. 15 hours
- c. 19 hours
- d. 21 hours

2 hours to solve 44 problems => 1 hour for 22 problems

200 problems solved

242 - 240 = 242 problems left to solve

4/22 = 11 hours per needs

11.1%

14) In a recent article in The Economist it was noted that "passenger cars made by Ford and G.M. averaged 40 miles per gallon, according to federal rankings, compared with 36 m.p.g. [miles per gallon] a decade ago." The percentage change in gas mileage for these cars over this decade is approximately equal to:

- a. 9%
- b. 10%
- c. 11%
- d. 12%

36 = initial value
40 = new value

\[
\% \text{ change in gas mileage} = \frac{40 - 36}{36} \times 100\%
\]

11.1%

15) If a market generates a side effect or externality, then free market solutions in this market:

- a. maximize producer surplus.
- b. are efficient.
- c. are inefficient.
- d. are equitable.

16) Given the PPF in the figure below, which of the following statements is true?

- a. A is not feasible, but it is an efficient production point.
- b. B is a more efficient production point than C.
- c. Both C and D are feasible production points.
- d. E is a feasible and efficient production point.
17) The linear domestic supply and domestic demand curves are given as drawn in the figure below. The equilibrium price, \( P^* \), is $6 and the equilibrium quantity, \( Q^* \), is 5. Under free trade the world price, \( P_w \), is $8. Given this information and holding everything else constant, which of the following statements is true?

- If this economy opens to trade, this economy will export 7 units of the good. ✓
- If this economy opens to trade, this economy will import 4 units of the good. ✗
- If this market opens to trade, domestic consumers will pay $6 when they buy one unit of the good. ✗ If open to trade, price will be \( P_w = 8 \) not \( P = 6 \)
- If this market opens to trade, domestic producers will receive $2 less per unit than they would if this market was a closed market. ✗

At \( P_w \):
- \( Q_{dom} = 9 \) exports = 7
- \( Q_{dom} = 2 \)

Since \( P_w > P \) of closed economy, we know that if this economy opens to trade it will export 7 units. If economy opens to trade domestic producers will sell the good at the world price which is $2 more per unit than closed economy price ($6/unit).
Use the following information to answer the next two (2) questions.

Anna and Mike produce milk and bread. Their production possibility frontiers are shown in the graphs below.

18) Anna’s opportunity cost for producing an additional unit of bread or an additional unit of milk are \( \frac{1}{M} \) and \( \frac{1}{B} \) respectively, while Mike’s opportunity cost for producing an additional unit of bread or an additional unit of milk are \( \frac{1}{5M} \) and \( \frac{1}{5B} \) respectively. Given these PPFs, Anna should specialize in producing milk while Mike should specialize in producing bread.

   a) 1 unit of milk; 1 unit of bread; 1/5 unit of milk; 5 units of bread; milk; bread
   b) 1 unit of milk; 1 unit of bread; 1/5 unit of milk; 5 units of bread; bread; milk
   x) 6 units of milk; 6 units of bread; 2 unit of milk; 10 units of bread; milk; bread
   x) 6 units of milk; 6 units of bread; 2 unit of milk; 10 units of bread; bread; milk

19) Which of the following prices does NOT fall within the acceptable range of trading prices for Anna and Mike for one unit of milk?

   a) Half a loaf of bread
   b) 2 loaves of bread
   c) 3.5 loaves of bread
   d) 4.5 loaves of bread
Use the following information to answer the next two (2) questions.

Consider the small, closed economy. In the market for cheese in this country you know the following where \( P \) is the price in dollars per unit of cheese and \( Q \) is the number of units of cheese:

- Domestic Demand for cheese: \( Q = 55 - \frac{1}{2} P \Rightarrow P = 110 - 2Q \)
- Domestic Supply of cheese: \( Q = P - 20 \Rightarrow P = Q + 20 \)

Furthermore, you know that the world price per unit of cheese is $30. \( P_w = 30 \)

20) The government of this country decides to open the cheese market to trade. Given this information and holding everything else constant, which of the following statements is true?

a. The quantity of cheese supplied by domestic producers increases when this market is opened to trade. \( \checkmark \) Supply \( \uparrow \) from 30 to 40 units.

b. Cheese consumption in this economy increases when this market is opened to trade. \( \checkmark \) Demand \( \uparrow \) Consumption \( \uparrow \) from 30 to 40 units.

c. The quantity of cheese supplied by domestic producers is greater than the quantity of cheese supplied by foreign producers when this market is opened to trade. \( \checkmark \) Dom. producers \( \uparrow \) Supply \( \uparrow \) units. \( \checkmark \) Imports \( \downarrow \) 20 units.

d. Domestic producers take most of the gains from trade when this market is opened to trade. \( \checkmark \) Dom. producers gain from opening this market to trade.

21) Suppose that the market for cheese is opened in this economy, but the government also decides to impose an import quota of 15 units of cheese. Given this information and holding everything else constant, which of the following statements is true?

a. Because of the import quota, the domestic price of cheese is now lower than the world price of cheese. \( \times \) higher

b. With the imposition of this import quota, cheese consumption in this economy increases relative to the level of cheese consumption in this economy when it is an open economy. \( \times \) Since \( P \) \( \uparrow \) / Import quota, \( \checkmark \) \( \checkmark \)

With the imposition of this import quota, the quantity of cheese supplied by domestic producers is greater than the quantity of cheese supplied by foreign producers.

d. This import quota imposed by the government is a favorable policy for domestic consumers relative to this market being an open market. \( \checkmark \) Import quotas \( \checkmark \) favorable policy for Dom. consumers gain from trade.
To answer (c) requires some work: I can easily eliminate answers (a), (b) and (d) so if I am confident I can just assume that (c) is the correct answer! But, let's do the work!

With the import quota:

\[ Q_{dom} + \text{Import Quota} = Q_{dom}^{w/quote} \]

\[
\begin{align*}
[ P - 20 ] + 15 &= 55 - \left( \frac{1}{2} \right) P \\
P - 5 &= 55 - \left( \frac{1}{2} \right) P \\
\left( \frac{3}{2} \right) P &= 60 \\
P &= \frac{60}{\left( \frac{3}{2} \right)} = 40
\end{align*}
\]

\[ Q_{dom} = P - 20 \]

\[ Q_{dom}^{w/quote} = 40 - 20 = 20 \Rightarrow \text{so quantity of cheese supplied by domestic producers in this example when there is an import quota is 20 units and 20 units is } \geq 15 \text{ if there is no import quota} \]

22) Suppose the equilibrium price of an inferior good decreases and the equilibrium quantity of that same good also decreases. A possible explanation for this outcome is:

a. Income decreased.

b. The price of an important input used in the production of the good decreased.

c. The price of a complement good in consumption increased.

d. The price of a substitute good in consumption increased.

23) Consider the market for personal computers that is initially in equilibrium. Assume that a new technology is discovered which lowers the marginal cost of production. At the same time, users of these personal computers find that they want the newest model because of its ability to allow the user to multi-task. Given this information and holding everything else constant, which of the following statements is true? Relative to the initial equilibrium price and equilibrium quantity, the new equilibrium:

a. Price is indeterminate and the new equilibrium quantity is indeterminate.

b. Price increases and the new equilibrium quantity increases.

c. Price is indeterminate and the new equilibrium quantity increases.

d. Price decreases and the new equilibrium quantity is indeterminate.

24) Consider the market for automobiles that is initially in equilibrium. People suddenly start using more public transportation in order to reduce the amount of pollution produced by driving cars. At the same time, automobile producers substitute an input of production that is cheaper than the input they have been using. Given this information and holding everything else constant, relative to the initial equilibrium price and quantity, the new equilibrium:

a. Price increases but the new equilibrium quantity is indeterminate.

b. Price increases and the new equilibrium quantity increases.

c. Price is indeterminate and the new equilibrium quantity is indeterminate.

d. Price decreases and the new equilibrium quantity is indeterminate.
25) In the following economy two goods are produced: Apples and Bananas. Suppose 2014 is the base year for purposes of calculating real GDP. 

<table>
<thead>
<tr>
<th>Quantities</th>
<th>Prices</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Apples</td>
</tr>
<tr>
<td>2013</td>
<td>10</td>
</tr>
<tr>
<td>2014</td>
<td>12</td>
</tr>
</tbody>
</table>

According to the data above, the approximate change in real GDP in percentage terms between 2013 and 2014 is:

a. 33%
b. 25%
c. 30%
d. 50%

26) Suppose that John gets a loan of 100 dollars for the year. The bank doesn’t charge any interest on the loan but it does charge John a fee of $1 for the financial service it has provided to him. Given this information, what is the contribution of this transaction to this year’s GDP?

a. $100  
b. $1  
c. $101  
d. $99

\[ \text{Real GDP} = \sum_{i=1}^{n} P_i Q_i \]

\[ \text{Real GDP}_{2013} = (10 \text{ apples}) \times (3/\text{apple}) + (5 \text{ bananas}) \times (12/\text{banana}) = 30 + 60 = 90 \]

\[ \text{Real GDP}_{2014} = (12 \text{ apples}) \times (3/\text{apple}) + (7 \text{ bananas}) \times (12/\text{banana}) = 36 + 84 = 120 \]

\[ \text{Δ in Real GDP} = \left[ \frac{120 - 90}{90} \right] \times 100\% = \left( \frac{30}{90} \right) \times 100\% = 33.33\% \]
Use the following information to answer the next three (3) questions.

Consider a market that has a market demand equation where \( P \) is the price per unit and \( Q \) is the quantity of units of the good:

Market Demand: \( P = 10 - Q \)

Furthermore, in this market there are only two firms whose individual firm supply curves are given as:

Supply Curve for Firm A: \( P = 2Q_A \)
Supply Curve for Firm B: \( P = 2Q_B + 4 \)

where \( Q_A \) is the quantity supplied by Firm A and \( Q_B \) is the quantity supplied by Firm B.

27) Given the above information, what is the equation for the market supply curve?

a. \( P = 2Q \) when \( Q \) is between 0 and 2 and \( P = 2 + Q \) when \( Q \) is higher than 2.
   b. \( P = 2Q \) when \( Q \) is between 0 and 2 and \( P = 1 + 2Q \) when \( Q \) is higher than 2.
   c. \( P = 1Q \) when \( Q \) is between 0 and 2 and \( P = 3 + Q \) when \( Q \) is higher than 2.
   d. \( P = 1Q \) when \( Q \) is between 0 and 2 and \( P = 1 + Q \) when \( Q \) is higher than 2.

28) What is the value of producer surplus when this market is in equilibrium? See work next page

a. \$12
b. \$10
c. \$11
d. \$9

29) Now, assume that a third firm enters the market and its owner announces “I will supply 1 unit of the good no matter the price”. Find the coordinates, \((Q, P)\) of the “kink point” of the new market supply curve given this information.

a. \((Q, P) = (2, 4)\)
b. \((Q, P) = (2, 5)\)
c. \((Q, P) = (3, 5)\)
d. \((Q, P) = (3, 4)\)
28) Find mkt eq.
   \[ P = 10 - Q \]

   First identify the mkt supply equation you need =
   if \( Q = 2 \) \( \Rightarrow \) then \( P \) from demand equation is \( 8 \) \( \Rightarrow \) we need \( P = Q + 2 \) as the mkt supply equation.

   \[
   D: P = 10 - Q \\
   S: P = Q + 2
   \]

   \[
   \begin{align*}
   6 - Q &= Q + 2 \\
   Q &= 2 \\
   P &= Q + 2 \\
   P &= 4 + 2 = 6
   \end{align*}
   \]

   if \( Q = 4 \), then \( P = 10 - Q \)
   \( P = 10 - 4 = 6 \)
   \( Q \)
   \( P = Q + 2 \)
   \( P = 4 + 2 = 6 \checkmark\)

   PS = a funny shaped object!

   \[
   PS = \square + \square + \square
   \]

   \[
   PS = \frac{1}{2}(4 - 0)(2) + (6 - 4)(2 - 0) + \left(\frac{1}{2}\right)(6 - 4)(4 - 2)
   \]

   \[
   PS = 4 + 4 + 2 = 10
   \]

29) Confirm
   \[
   Q = 1
   \]

   \[
   4
   \]

   \[
   23
   \]

   Kink point = \((3, 4)\)