

Harvard Pre-Collegiate Economics Challenge
April 5th, 2014
Individual Round

Instructions: Please print your name and school on the answer sheet, which is on the reverse of this page. Ambiguous answers will be marked wrong. Only the answers on the answer sheet will be scored. You have 90 minutes to complete this round. There are 60 multiple choice questions, with the correct answer being one and only one of the letters A, B, C, and D. Illegible answers will be marked incorrect.

Each...	Will Receive...
Correct Answer	One (1) point
Blank Answer	0.25 points
Incorrect Answer	Zero (0) points

You may mark, annotate, disassemble, or otherwise use the test in any way. All questions assume *ceteris paribus* (all other things being equal or held constant). Calculators, cell phones, laptops, and notes are not permitted.

Answer Sheet

Name:

School:

For each question, clearly circle the letter for your answer if you choose to answer it. As a reminder, the correct answer will be one and only one of the letters A, B, C, or D for each question.

1 A B C D	21 A B C D	41 A B C D
2 A B C D	22 A B C D	42 A B C D
3 A B C D	23 A B C D	43 A B C D
4 A B C D	24 A B C D	44 A B C D
5 A B C D	25 A B C D	45 A B C D
6 A B C D	26 A B C D	46 A B C D
7 A B C D	27 A B C D	47 A B C D
8 A B C D	28 A B C D	48 A B C D
9 A B C D	29 A B C D	49 A B C D
10 A B C D	30 A B C D	50 A B C D
11 A B C D	31 A B C D	51 A B C D
12 A B C D	32 A B C D	52 A B C D
13 A B C D	33 A B C D	53 A B C D
14 A B C D	34 A B C D	54 A B C D
15 A B C D	35 A B C D	55 A B C D
16 A B C D	36 A B C D	56 A B C D
17 A B C D	37 A B C D	57 A B C D
18 A B C D	38 A B C D	58 A B C D
19 A B C D	39 A B C D	59 A B C D
20 A B C D	40 A B C D	60 A B C D

Part I: Questions 1-20

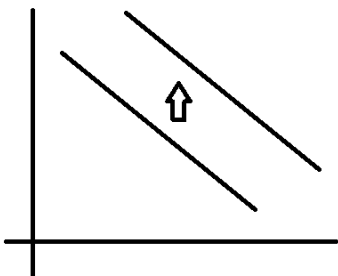
(1) -- Which of the following would be the best example of a Giffen good?

- A. Luxury cars
- B. Cable television
- C. Frozen dinners
- *D. Rice in rural China

(2) -- An individual's labor supply curve is derived from that person's preferences about the trade-off between income and:

- A. work
- *B. leisure
- C. productivity
- D. nominal wages

(3) -- See figure below



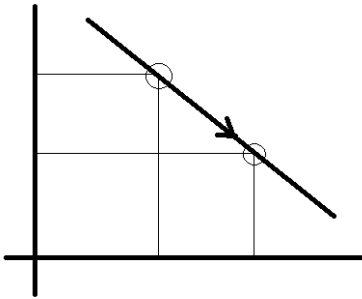
Which of the following policies or changes could produce the above change in the demand curve for soda (see figure)? The y-axis is price and x-axis is quantity.

- A. an increase in taxes or a decrease in subsidies on soda
- B. a decrease in taxes or an increase in subsidies on soda
- C. a decreased number of buyers of soda
- *D. an increased preference among the general public for soda

(4) -- A firm has a monopoly in a certain good. If the monopoly price is \$10 greater than the equilibrium price (the price at which marginal cost equals marginal revenue), the monopoly quantity produced is 28 units, and the efficient quantity (the quantity at which marginal revenue equals demand) is 36 units, then assuming linear supply and demand, the deadweight loss is:

- *A. \$40
- B. \$80
- C. \$120
- D. \$160

(5) -- See figure below



Which of the following policies or changes could produce the above change in the demand curve for gasoline (see figure)? The y-axis is price and x-axis is quantity.

- A. an increase in taxes on gasoline
- B. a decrease in people's income
- *C. a decrease in taxes on gasoline
- D. an increase in people's income

(6) -- GDP is divided among four main components of expenditure. These components are:

- *A. consumption, investment, government purchases, net exports
- B. consumption, investment, government purchases, net imports
- C. consumption, investment, government purchases, international trade
- D. consumption, government purchases, net imports, international trade

(7) -- In a given year the nominal GDP increased 9% and real GDP increased 4%. What was the rate of inflation?

- A. -5%
- B. -4%
- *C. 5%
- D. 13%

(8) -- Consumption is defined as spending by households on goods and services with the exception of purchases of:

- A. automobiles
- *B. new housing
- C. luxury goods
- D. medical services

(9) -- If \$150 in excess reserves generates a maximum expansion of the money supply of \$750, what is the reserve requirement?

- A. 5%
- B. 10%
- C. 12.5%
- *D. 20%

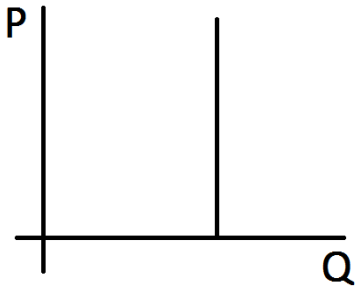
(10) -- If government purchases decline, we would expect the long run effect on consumption and investment to be:

- A. consumption increasing, investment increasing
- *B. consumption staying the same; investment increasing
- C. consumption staying the same; investment staying the same
- D. consumption decreasing, investment increasing

(11) -- An owner of a truck in the perfectly competitive market of delivery service:

- A. can make a greater profit than others in the long term if he buys a new truck
- B. can make a greater profit than others in the long term if he works longer hours
- *C. cannot make a greater profit than others in the long term
- D. none of the above

(12) -- See figure below



Consider the above graph for a certain good's demand curve. We can conclude that the elasticity of demand for this good equals:

- *A. 0
- B. greater than 0, less than 1
- C. 1
- D. greater than 1, but finite
- E. infinite

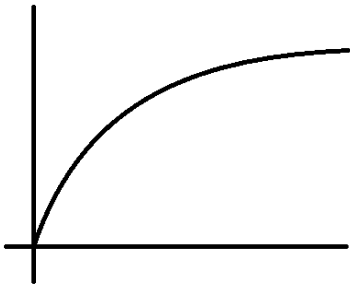
(13) -- Which of the following will cause the demand curve for hamburgers to shift to the right?

- A. An increase in the price of hamburgers
- B. An increase in the price of French fries, a complement to hamburgers
- C. A decrease in the cost of producing hamburgers
- *D. An increase in the price of pizza, a substitute for hamburgers

(14) -- A profit-maximizing firm will hire:

- A. labor until its wage rate equals its average revenue product
- *B. labor until its wage rate equals its marginal revenue product
- C. labor until its wage rate equals the interest rate
- D. capital until the interest rate equals the wage rate

(15) -- See figure below



Let the curve above be a graph for Jason's utility and wealth, with wealth on the x-axis and utility on the y-axis. Which of the following best describes his risk preference?

- A. Jason is risk-loving/risk-seeking
- B. Jason is risk-neutral
- *C. Jason is risk-averse/risk-avoiding
- E. Jason has no attitude toward risk

(16) -- Which of the following is not a component of M1 money supply?

- A. Demand deposits
- *B. Small time deposits
- C. Traveler's checks
- D. Coins in circulation

(17) -- Calculate the unemployment rate based on the following:

Population	20,000
Proportion of population that is of working age	0.75
Labor force participation rate	0.60
Proportion of working-age population that are "discouraged workers"	0.02
Officially unemployed	810

- *A. 9%
- B. 7%
- C. 4.5%
- D. 2%

(18) -- Gold and silver are both forms of:

- A. liquid money
- B. fiat money
- *C. commodity money
- D. none of the above

(19) -- A decrease in the money supply leads to:

- A. an increase in the value of money and an increase in the price level
- *B. an increase in the value of money and a decrease in the price level
- C. a decrease in the value of money and a decrease in the price level
- D. a decrease in the value of money and an increase in the price level

(20) -- In a certain economy that only produces cars, each car sells for \$50. If the velocity of money is 10 and the quantity of money is \$2000, how many cars are produced each year?

- A. 100
- B. 200
- *C. 400
- D. 500

Part II: Questions 21-40

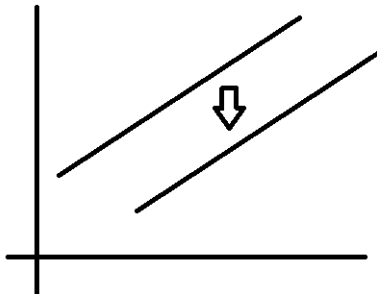
(21) -- Alice and Bob are playing a game in which each person has a coin and reveals either heads or tails to the other player. If they show the same side, player A loses 1 dollar and player B gains one dollar. If they show different sides, player A gains one dollar and player B loses one dollar. How many Nash equilibria are there in this game?

- A. 0
- *B. 1
- C. 2
- D. 3

(22) -- In a perfectly competitive industry, the market price of the product is \$12. A firm produces at a level of output where average total cost is \$16, marginal cost is \$16, and average variable cost is \$8. To maximize its profit, the firm should:

- A. increase its selling price
- *B. decrease output but keep producing
- C. shut down
- D. leave both price and output unchanged

(23) -- See figure below



Which of the following policies or changes could NOT produce the above change in the supply curve for cigarettes (see figure)? The y-axis is price and x-axis is quantity.

- A. a decrease in taxes on paper (a factor of production for cigarettes)
- B. an improvement in the technology for producing cigarettes
- *C. an increased preference among the general public for cigarettes
- D. an increase in subsidies on humectants (a factor of production for cigarettes)

(24) -- Which of the following statements is true for a perfectly competitive firm but not true for a monopoly?

- A. The firm's price is equal to its average revenue
- *B. The firm cannot affect the market price for its good
- C. It is difficult for other firms to enter the industry
- D. The firm must lower its price in order to sell more of its product

(25) -- A company sells its product in a perfectly competitive market for a price of \$15 per unit and hires workers at a daily wage of \$75. Labor is the only cost, and the firm is currently earning profits. If the company hires one more worker and output increases by 5 units per day, the firm's profits will:

- A. decrease by \$15
- B. decrease by \$75
- C. increase by \$75
- *D. remain unchanged

(26) -- Published by The Economist, the Big Mac Index serves best as a measure for which of the following?

- *A. Purchasing-power parity
- B. Real GDP Growth rate
- C. Nominal interest rate
- D. Standardized rate of globalization

(27) -- While reducing the inflation rate from 5% to 3%, the GDP of the country of Unfortunia dropped from \$5000 to \$4500. What was the sacrifice ratio in Unfortunia that year?

- A. 10
- *B. 5
- C. 2
- D. 1/5

(28) -- Paul Volcker, chairman of the Federal Reserve from 1979 until 1987, was known for which changes in inflation and unemployment in the United States?

- A. increased inflation, increase unemployment
- B. increased inflation, decrease unemployment
- *C. decreased inflation, increased unemployment
- D. decreased inflation, decreased unemployment

(29) -- The ratio of a country's exports to its total output (GNP or GDP):

- A. is known as the index of openness.
- B. provides a rough measure of the importance of international trade to that economy.
- C. if calculated for the United States would be quite low.
- *D. All of the above

(30) -- In general, other things equal, trade creation is more likely to outweigh trade diversion for a home country forming a customs union with partner countries if:

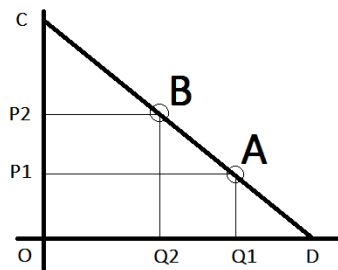
- (i) the total number of countries forming the union is _____, and
- (ii) if the level of tariffs in the home country prior to the formation of the union is _____.

- A. small rather than large; high rather than low
- B. small rather than large; low rather than high
- *C. large rather than small; high rather than low
- D. large rather than small; low rather than high

(31) -- Whenever the production of a good creates negative externalities, an unregulated market will result in:

- A. too little of the good being produced
- B. an optimal amount of the good being produced as long as the market is perfectly competitive
- *C. society's marginal cost being higher than the firm's marginal cost
- D. the firm's marginal cost being higher than society's marginal cost

(32) -- See figure below



Consider the above graph for the demand curve for a certain good. The y-axis is price and x-axis is quantity. A is the initial equilibrium and B is the new equilibrium. Let price and demand at A be P_1 and Q_1 and price and demand at B be P_2 and Q_2 . If rectangle $O P_1 A Q_1$ has an area of 1000, rectangle $O P_2 B Q_2$ has an area of 1200, $P_1 = 20$, and $Q_2 = 30$, what is the absolute value of the change in consumer surplus?

- A. 400
- B. 600
- *C. 800
- D. 1600

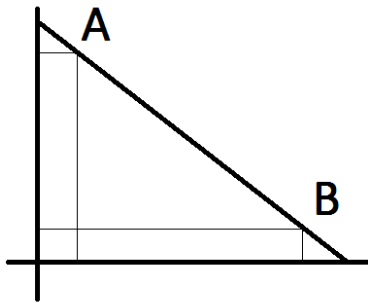
(33) -- Pointilist, a firm specializing in producing pencil sharpeners, sells its goods at prices significantly lower than its competitors in an attempt to drive them out of the market. This is an example of:

- A. Price floor
- B. Monopolistic pricing
- *C. Predatory pricing
- D. Resale price maintenance

(34) -- Say that the relationship between taxation t and government revenue $R(t)$ in the country of Kronosia given by the Laffer curve $R(t) = 100t^2 - 60t + 9$, where $0 \leq t \leq 1$ is the tax rate and R is total revenue in billions of dollars. If the current taxation is at a rate of 30%, should the government raise/decrease taxes, and if so, what is the optimal tax rate?

- A. The tax rate should not change
- B. Increase to 70%
- C. Increase to 50%
- *D. Decrease to 0%

(35) -- See figure



Consider the above graph for the demand curve of a certain good. The y-axis is price and x-axis is quantity. Both axes are on a linear scale. Which of the following is true?

- *A. elasticity at A is greater than elasticity at B
- B. elasticity at A is equal to elasticity at B
- C. elasticity of A and B are both less than 1
- D. elasticity of A is less than the elasticity of B

(36) -- Like tariffs, quotas tend to lead to:

- *A. higher prices and reduced imports.
- B. increased government revenue.
- C. increased consumer surplus.
- D. All of the above.

(37) -- A decrease in net foreign investment coincides with:

- A. a decrease in the real interest rate and a decrease in the real exchange rate
- *B. a decrease in the real interest rate and an increase in the real exchange rate
- C. an increase in the real interest rate and a decrease in the real exchange rate
- D. an increase in the real interest rate and an increase in the real exchange rate

- (38) -- Which of the following would have the greatest effect on GDP?
- A. \$50 billion increase in government expenditure, \$50 billion decrease in taxes
 - B. \$50 billion increase in government expenditure, \$50 billion increase in taxes
 - *C. \$100 billion increase in government expenditure
 - D. \$100 billion decrease in taxes
- (39) -- What was the gross domestic product for the United States roughly worth in 2013?
- A. 4 trillion
 - B. 8 trillion
 - *C. 16 trillion
 - D. 20 trillion
- (40) -- Of the following set of countries, which set does not contain countries that are all members of the European Union (EU)? In other words, which set has at least one country that is not part of the EU?
- *A. France, Spain, Switzerland, United Kingdom
 - B. Germany, Italy, Portugal, Luxembourg
 - C. Denmark, Ireland, the Netherlands, Sweden
 - D. Belgium, Greece, Poland, France

Part III: Questions 41-60

- (41) -- Given the following balance sheet for Bank A, calculate its leverage ratio:

Assets	Liabilities
Reserves = 60	Deposits = 600
Securities = 30	Debt = 100
Loans = 710	Capital/Equity = 100

- A. 4
 - B. 6
 - *C. 8
 - D. 10
- (42) -- Which of the following was NOT a feature of Mortgage Backed Securities (MBS) sold during the lead-up to the 2008 Financial Crisis?
- *A. Allowed mortgage owners to maintain personal relationships with banks
 - B. Geographic diversification of mortgages
 - C. Risk minimization through bundling mortgages with negative correlation
 - D. Often contained subprime mortgages
- (43) -- The crowding-out effect refers to the offset in aggregate demand that results when:
- A. contractionary fiscal policy lowers the interest rate and reduces investment
 - B. expansionary fiscal policy lowers the interest rate and increases investment
 - *C. expansionary fiscal policy raises the interest rate and reduces investment
 - D. expansionary fiscal policy raises the interest rate and increases investment

(44) -- Which of the following was the largest subprogram of American Recovery and Reinvestment Act of 2009 (ARRA) provisions, in absolute dollar amounts?

- *A. Tax Relief
- B. Health Care
- C. State and Local Fiscal Relief
- D. Infrastructure

(45) -- When interest rates are close to 0%,

- A. Both monetary policy and fiscal policy are very effective
- B. Both monetary policy and fiscal policy are very ineffective
- C. Monetary policy is very effective, while fiscal policy is very ineffective
- *D. Monetary policy is very ineffective, while fiscal policy is very effective

(46) -- A natural monopoly is:

- *A. rival and excludable
- B. rival but not excludable
- C. not rival but excludable
- D. neither rival nor excludable

(47) -- The demand function for a certain good given by the equation $D(p)=100-p$. If the price of the good is \$50, what is net consumer surplus for this good?

- A. \$1000
- *B. \$1250
- C. \$2000
- D. \$2500

Questions 48-50 refer to the following information:

Let x = apples and y = oranges. Both x and y are nonnegative.

Alice's production possibilities frontier is $a_1x + b_1y = c$.

Ben's production possibilities frontier is $a_2x + b_2y = c$.

a_1 , a_2 , b_1 , b_2 , and c are constants.

Let $a_1 < b_1 < a_2 < b_2$ and $a_1b_2 < a_2b_1$.

(48) -- Alice should produce ___ apples.

- A. a_2/a_1
- B. b_2/a_1
- *C. c/a_1
- D. c/b_1

(49) -- Alice's opportunity cost for producing 1 apple is:

- *A. a_1/b_1
- B. a_2/b_1
- C. a_1/b_2
- D. a_2/b_2

(50) -- Alice _____ an absolute advantage over Ben in fruit production and _____ a comparative advantage over Ben in orange production.

- A. does have , does have
- *B. does have, does not have
- C. does not have, does have
- D. does not have, does not have

(51) -- Given that the cross-price elasticity of demand for butter with respect to margarine is 0.8, and that in the past year, the unit price of margarine has increased twofold while the demand for butter in the US this year is 3.6 billion pounds, what was the demand for butter in the US last year, in billions of pounds?

- A. 6.48
- B. 4.5
- *C. 2
- D. 2.8

(52) -- Quantity of labor in a monopsony is _____ quantity of labor in a perfectly competitive labor market, while wages in a monopsony are _____ wages in a perfectly competitive labor market.

- *A. Less than, less than
- B. Greater than, greater than
- C. Less than, greater than
- D. Greater than, less than

(53) -- Given the following information, calculate the nominal exchange rate between the United States dollar (USD) and the Brazilian real (BRL).

Price of banana in Brazil: 2.80 BRL

Price of banana in United States: 2.00 USD

Real exchange rate: (10 Brazilian bananas)/(7 US Bananas)

- *A. (1 USD) / (2 BRL)
- B. (2 USD) / (1 BRL)
- C. (7 USD) / (10 BRL)
- D. (5 USD) / (7 BRL)

(54) -- Dave's firm works in a perfectly competitive market. At the point where marginal cost equals marginal revenue, Dave's firm has an average total cost of \$12 and an average variable cost of \$8. At which price for the good would Dave's firm stay in the market in the short run but leave the market in the long run?

- A. \$4
- B. \$7
- *C. \$10
- D. \$13

(55) -- If an economy has had the following values of nominal GDP and GDP deflation, what was the rate of growth of real GDP between 2009 and 2010?

Nominal GDP 2009	2100		GDP deflator 2009	105
Nominal GDP 2010	2530		GDP deflator 2010	115

- A. about 5 percent
- *B. about 10 percent
- C. about 15 percent
- D. about 20 percent

(56) -- In the United States, which body is considered the ruling authority on defining recessions?

- A. The Treasury Department
- *B. The National Bureau of Economic Research
- C. The Federal Reserve
- D. Congress

(57) -- Which of the following is the correct formula for the multiplier of fiscal policy, also known as the government spending multiplier? MPC refers to the marginal propensity to consume.

- A. $1/(1+MPC)$
- *B. $1/(1-MPC)$
- C. $1+MPC$
- D. $1-MPC$

(58) -- If good X of country C faces a 10% tariff in country A and a 20% tariff in country B, but if A and B have free trade between each other, then A and B are part of which one (and only one) of the following types of groupings?

- *A. Free trade area
- B. Customs union
- C. Common market
- D. Economic Union

(59) -- When the government increases its budget deficit and thereby affects the supply of loanable funds:

- A. real interest rate decreases and real exchange rate decreases
- B. real interest rate increases and real exchange rate decreases
- C. real interest rate decreases and real exchange rate increases
- *D. real interest rate increases and real exchange rate increases

(60) -- Approximately how many months did it take for the 2008 Recession cycle to go from peak to trough?

- A. 6 months
- B. 10 months
- *C. 20 months
- D. 28 months