



Harvard Pre-Collegiate Economics Challenge

April 6, 2013

Individual Round

Instructions: Please put your name, school, and answers (in capital letters) on the answer sheet, which is on the reverse of this page. Illegible 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. For each correct question, you will receive 1 point; for each incorrect question, 0.25 points will be deducted. When time is called, put your pencil down.

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). Unless otherwise specified, assume that markets are in a competitive equilibrium.

Calculators, cell phones, and notes are not permitted.

Answer Sheet

Name:

School:

- SOME TYPOS FIXED IN REAL VERSION BUT NOT HERE

For each question, clearly write the **CAPITALIZED** letter of your answer.

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

1. Econometrics is most related to which other field of study?
 - a. Statistics (*)
 - b. Psychology
 - c. Political science
 - d. Philosophy

2. On March 1st, 2013, the U.S. government underwent “sequestration.” Initially designed to force the White House and Congress to agree on a new budget deal, sequestration has greatly impacted the government and the public sector. Which of the following correctly identifies the type of policy implemented by sequestration?
 - a. Monetary Expansion
 - b. Fiscal Expansion
 - c. Monetary Contraction
 - d. Fiscal Contraction (*)

3. According to the Federal Reserve Act, which of the following is NOT one of the Fed’s key objectives for monetary policy in the U.S.?
 - a. Maximize employment
 - b. Stabilize prices
 - c. Moderate long-term interest rates
 - d. Implement the tax code (*)

4. An increase in which of the following would cause an increase in aggregate supply?
 - a. Prices of imports
 - b. Consumer spending
 - c. Labor productivity (*)
 - d. Interest rates

5. Which of the following is most likely to cause an increase in the international value of the U.S. dollar?
 - a. Higher real interest rates in the U.S. (*)
 - b. Lower government expenditures in the U.S.
 - c. Higher real interest rates abroad
 - d. Expansionary monetary policy in the U.S.

6. Inflation occurs when:
- Growth in money supply exceeds growth in output (*)
 - Growth in output exceeds growth in money supply
 - There is too much currency in the economy
 - There is a large government budget deficit
7. Which of the following is not included in GDP?
- Private Consumption
 - Government Spending
 - Federal Taxes (*)
 - Gross Investment
8. Which of these countries has one of the five largest economies in the world in terms of GDP?
- U.K.
 - Brazil
 - Japan (*)
 - India
9. In the circular flow of inputs and outputs, households provide _____ to the markets for factors of production.
- Goods and services bought
 - Goods and services sold
 - Wages, rent, and profit
 - Land, labor, and capital (*)
10. Which will have the least impact on aggregate demand?
- \$200 decrease in taxes (*)
 - \$200 increase in government expenditures
 - \$100 decrease in taxes, \$100 increase in government expenditures
 - \$50 decrease in taxes, \$150 increase in government expenditures

11. If the marginal propensity to save is 0.75, which will increase aggregate demand by \$1100?
- increases in government spending by \$200, decreases in taxes by \$100 (*)
 - increases in government spending by \$150, decreases in taxes by \$150
 - increases in government spending by \$100, decreases in taxes by \$200
 - increases in government spending by \$250, decreases in taxes by \$50
12. The liquidity of an asset reflects how easily the asset can be converted as:
- a medium of exchange (*)
 - a unit of account
 - a store of value
 - none of the above
13. Which of the following are possible explanations for upward-sloping short-run aggregate supply?
- I. Liquidity Theory
II. Sticky-Wage Theory
III. Sticky-Price Theory
- II only
 - I and II only
 - II and III only (*)
 - I, II and III
14. If aggregate labor supply shifts to the left while aggregate labor demand shifts to the right, then what is the relationship between the change in equilibrium wage and the change in the marginal product of labor?
- Change in wage is greater than change in MPL
 - Change in wage is equal to change in MPL (*)
 - Change in wage is less than change in MPL
 - Impossible to determine from the information given
15. Let us visualize the Lorenz curve for Country A. The area between the Lorenz curve and the two axes is 0.19. Calculate the Gini coefficient for this country.
- 0.19
 - 0.38
 - 0.62 (*)
 - 0.81

16. Which of the following is NOT a term used to describe inflation-related costs?
- Shoe leather costs
 - Menu costs
 - Price discrimination (*)
 - The changing yardstick
17. A sharp increase in the price of oil would theoretically have the biggest impact on which of the following statistics?
- Nominal GDP
 - Headline CPI (*)
 - Real GDP
 - Core CPI
18. Which of the following countries does NOT use the Euro?
- France
 - Greece
 - The Netherlands
 - The United Kingdom (*)
19. Which of the following scenarios is most likely to push a country's production possibilities frontier outwards?
- The increase in the global demand for its main export
 - Bad weather that ruins the crop for its main import
 - A tax credit on Research and Development (*)
 - The monopolization of one of its major industries
20. Which of the following is NOT one of the "Four Asian Tigers" that underwent rapid economic growth in the second half of the 20th century?
- South Korea
 - Singapore
 - Mainland China (*)
 - Hong Kong

21. What is another name for Reagonomics?
- Supply side economics (*)
 - Keynesian economics
 - Rational expectations economics
 - Neoliberal economics
22. Which of the following should a Keynesian government do in times of recession?
- cut tax rates (*)
 - peg the currency to gold
 - decrease spending
 - declare war
23. In terms of economic efficiency, what does a monopolist produce?
- too much of a good and charges too low a price
 - too much of a good and charges too high a price
 - too little of a good and charges too low a price
 - too little of a good and charges too high a price (*)
24. A market is definitely NOT perfectly competitive if which of the following is true in equilibrium?
- Price exceeds average variable cost.
 - Price exceeds marginal cost. (*)
 - Price exceeds average fixed cost.
 - Price equals opportunity cost.
25. As its output increases, a firm's short-run marginal cost will eventually increase because of what?
- economies of scale
 - a lower product price
 - inefficient production
 - diminishing returns (*)

26. Each of the industries below is subject to significant U.S. regulatory oversight. Which is due to a naturally monopolistic cost structure?
- Automobile manufacturing
 - Electricity generation
 - Pipeline transportation (*)
 - Long-haul trucking
27. When a consumer's income increases, what is true about his demand for a given good?
- Demand must increase
 - Demand must either increase or stay unchanged
 - Demand may increase, stay unchanged, or decrease (*)
 - There is no relationship between income and demand
28. Say that a consumer borrows and/or saves annually at the market interest rate. If her expectation for next year's interest rate increases, what should happen to her present consumption?
- Consumption should increase
 - Consumption should decrease
 - Consumption should stay unchanged
 - Uncertain; depends on other information (*)
29. Say that the U.S. treated lumber market is supplied competitively by four different manufacturers. Manufacturer #1 has a supply curve given by $P_1(Q)=1*Q$, Manufacturer #2 has a supply curve given by $P_2(Q)=2*Q$, Manufacturer #3 has $P_3(Q)=3*Q$, and Manufacturer #4 has $P_4(Q)=4*Q$. Demand for lumber is inelastic at 100 units. What is the equilibrium price of lumber?
- 6
 - 10
 - 24
 - 48 (*)

(Solution: $Q_i(P)=(1/i)P$ so $Q(P)=[1+1/2+\dots+1/4]P = (25/12)P = 100$, so $P=48$.)

30. The demand curve for plastic bags is defined for positive prices and quantities by the function $Q(P)=100-P$. So at a price of 10, consumers will purchase 90 bags; at a price of 80, consumers would purchase 20 bags. Which of these statements about the price elasticity of plastic bag demand is true?

- I. Elasticity at Price=99 > Elasticity at Price = 50
- II. Elasticity at Price=1 > Elasticity at Price = 50
- III. Elasticity at Price=1 = Elasticity at Price = 99

- b. I, II, and III
- c. I and II only
- d. I only (*)
- e. II only

31. North American energy markets are experiencing an ongoing supply shock from new hydrocarbon production in states like North Dakota, Pennsylvania, and Texas. Due primarily to transportation bottlenecks, prices for the same commodity may differ across regional markets.

Say an energy trading firm profits by simultaneously entering the following contracts:

- I. Buy natural gas for \$1.50/mcf from a thinly traded Pennsylvania market
- II. Transport natural gas for \$0.80/mcf from Pennsylvania to Louisiana
- III. Sell natural gas for \$2.40/mcf at a major Louisiana supply point

Eventually, the price of Pennsylvania natural gas increases to \$1.60/mcf. Which concept does this scenario best illustrate?

- a. Arbitrage (*)
- b. Vertical integration
- c. Risk aversion
- d. Incomplete markets

32. The following questions relate to pollution externalities from the Plastics industry. The pollution level \mathbf{P} produced by the industry is a function of the investment \mathbf{T} in advanced technologies:

$$\mathbf{P}(\mathbf{T}) = 1 - 3 \mathbf{T}$$

So an investment of $\mathbf{T} = 1/3$ is sufficient to eliminate pollution. Say that $\mathbf{P}(\mathbf{T}) = 0$ for $\mathbf{T} \geq 1/3$.

The marginal cost to the public of an additional unit of pollution, \mathbf{C}' , is a function of the total pollution level \mathbf{P} . (\mathbf{C}' is measured in dollars per unit of pollution and \mathbf{T} is measured in dollars.)

$$\mathbf{C}'(\mathbf{P}) = 5 \mathbf{P}$$

What is the socially efficient level of pollution?

- a. $\mathbf{P} = 1/15$
- b. $\mathbf{P} = 1/10$
- c. $\mathbf{P} = 1/5$
- d. $\mathbf{P} = 1$

(Solution: the marginal dollar invested in pollution control will yield a three-unit reduction in pollution, which will correspond to a $15 \mathbf{P}$ reduction in consumer costs. Setting $15 \mathbf{P} = 1$, we find that $\mathbf{P}^* = 1/15$.)

33. Say that there is no government regulation. The Coase theorem states that under certain assumptions, private bargaining between the public and the Plastics industry should be able to resolve the externalities problem. Realistically, why might the parties not reach such a resolution?
- a. There is no mutually agreeable solution to the stated problem
 - b. Bargaining between the entire public and the company may be costly (*)
 - c. The Coase theorem is often irrelevant in practice
 - d. The Coase theorem applies to aggregate markets, not specific agents

34. Government policymakers now consider two different approaches to correcting this market failure. Say that the socially optimal pollution level P^* (from problem #32), as well as the pollution function $P(T)$ and marginal cost function $C'(P)$, are known with certainty. The government considers two different policy approaches: “cap and trade” and “pay to pollute”.

Under “cap and trade”, the government will outlaw pollution unless the polluter owns a special permit. The government will auction exactly P^* such permits, which may be freely exchanged and resold among Plastics companies.

Under “pay to pollute”, the government will monitor the industry and collect a pollution charge at a rate equal to $C'(P)$ for each additional unit of pollution.

What would be the effect of each policy?

- a. Neither policy would reduce pollution to P^*
 - b. Both policies would reduce pollution to P^* (*)
 - c. Cap and trade would reduce pollution to P^* but pay to pollute would not
 - d. Pay to pollute would reduce pollution to P^* but cap and trade would not
35. What is the correct economic term for the “pay to pollute” policy described in question #34?
- a. Externality expense
 - b. Pigouvian tax (*)
 - c. Internality
 - d. Optimized tariff

36. Most people are *risk averse*, meaning that they dislike uncertainty. (Risk aversion is closely related to the idea of diminishing marginal utility.) Consider the following bets:

- I. 40% chance to win \$100; 60% chance to lose \$100
- II. 50% chance to win \$100; 50% chance to lose \$100
- III. 60% chance to win \$100; 40% chance to lose \$100

Which bets would be **rejected** by all risk-averse people?

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

37. Under which taxation regime would a high-earner's marginal tax rate be lower than her average tax rate?

- a. Lump sum tax (*)
- b. Flat tax
- c. Progressive tax
- d. None of the above

38. Budislavka (row player) and Nedyalko (column player) participate in a game with the following payoff matrix:

		<i>Nedyalko</i>	
		Move to France	Buy new pants
<i>Budislavka</i>	Increase savings	B: -6 N: -14	B: -11 N: -11
	Indulge cravings	B: -3 N: -11	B: -10 N: -10

Which player has a strictly dominant strategy?

- a. Budislavka
- b. Nedyalko
- c. Both (*)
- d. Neither

39. After it is spun off from the Harvard Undergraduate Economics Association to become a profit-maximizing publicly listed corporation, the Harvard Pre-Collegiate Economics Challenge (HPEC) must reconsider its pricing practices. HPEC is a monopolist whose income comes from registration fees paid by attending teams. HPEC's attendees are either Local or Non-Local, with the following demand-schedules:

Registration fee (\$)	Local teams	Non-Local teams
25	48	12
50	24	12
75	16	12
100	12	11
125	11	8
150	9	6
175	7	4

(By law, the registration fee must be a multiple of \$25.)

If HPEC's marginal cost is \$25/team and price discrimination is legally prohibited, what is the profit-maximizing registration fee?

- a. \$100
 - b. \$125 (*)
 - c. \$150
 - d. \$175
40. To escape restrictive Massachusetts antitrust laws, HPEC reincorporates in Yazoo City, Mississippi. Say that the demand schedule from above remains unchanged. If HPEC may now price discriminate based on whether teams are Local or Non-Local (but still may not further price-discriminate within each category), what will be the increase in profits?
- a. \$0
 - b. \$50 (*)
 - c. \$150
 - d. \$250

41. During the housing boom of the 2000's, residential home prices generally appreciated across the U.S. The rate of appreciation, however, varied significantly between states, and cities, and neighborhoods for a number of reasons. Some prominent economists such as Harvard Prof. Edward L. Glaeser have suggested that local zoning laws may have contributed greatly to the rapid price spikes seen in some areas. How might zoning laws be related to housing price increases?
- Zoning laws cause housing supply to increase slower than demand (*)
 - Zoning laws impose an effective price floor on the housing market
 - Zoning laws artificially increase home demand in some areas
 - Zoning laws provide incentives for owners to quickly resell their homes
42. Which of the following conditions is not necessarily satisfied in a competitive market?
- There are many buyers and sellers
 - The goods offered by various sellers are largely the same
 - Buyers and sellers may freely enter or exit the market
 - There are no outside substitutes (*)
43. A certain company produces output using a combination of labor and capital (e.g. machinery) inputs. If labor productivity increases and long-run interest rate expectations decrease, which of the following is not a possible outcome?
- The firm's supply curve remains unchanged (*)
 - The firm purchases less capital
 - The firm substitutes labor for capital
 - The market price decreases for the firm's output
44. The implementation of a minimum wage influences most which group?
- part-time workers
 - discouraged workers
 - unskilled workers and teenagers (*)
 - skilled workers
45. In general, a flatter demand curve is more...
- Supply inelastic
 - Supply elastic
 - Price inelastic
 - Price elastic (*)

46. Hot Dogs and Hot Dog Buns are generally complementary products. If there is an increase in the price of hot dogs,
- the supply curve for Hot Dog Buns will move to the left
 - the demand curve for Hot Dog Buns will move to the left (*)
 - there will be no movement in supply or demand curves for Hot Dog Buns
 - there will be movement along the demand curve for Hot Dog Buns
47. Which of the following is an indicator that a market is not perfectly competitive at equilibrium?
- Market price exceeds the average cost
 - Market price exceeds the marginal cost (*)
 - Market price exceeds the variable cost
 - Market price exceeds the opportunity cost
48. Which of the following would not generally be considered a fixed cost?
- Building Costs
 - Insurance Costs
 - Cost of Goods Sold (*)
 - Research and Development Costs
49. Let's look at the market for apples. The supply curve is given by $S = P$, and the demand curve is given by $D = 20 - 3*P$, where P is the price of apples. Now suppose that the government imposes a price floor of \$6. Which of the following correctly pairs the identity and magnitude of the excess value?
- An excess supply of 2 apples.
 - An excess supply of 4 apples. (*)
 - An excess demand of 2 apples.
 - An excess demand of 4 apples.
50. Which of the following is the correct form of utility functions regarding perfect substitutes? X_1 and X_2 are the quantities of each good, respectively, and a , b , and c are positive coefficients.
- A. $a*X_1 + b*X_2$ (*)
 - B. $a*\min\{X_1, X_2\}$
 - C. $a*X_1^2 + b*X_2 + c$
 - D. $a*\max\{X_1, X_2\}$

51. Which of the following products will have the greatest price change (in %) when long term interest rate increases by 1%?
- 1-year US Treasury note
 - 10-year Bond issued by AT&T
 - 10-year US Treasury Bond
 - 30-year US Treasury Bond (*)
52. A *Homo Economicus* does not have to be
- self-interested
 - rational
 - omniscient (*)
 - utility maximizing
53. A financial transaction between two parties WITHOUT the supervision of an exchange is called a(n)
- Over the counter trade
 - Carry trade
 - Free trade
 - O'Hare trade
54. A furniture manufacturer in a perfectly competitive economy faces a market price of \$500 per unit and an average total cost function given by $ATC = 10x + 20$, where x denotes the number of units of good produced. What is the level of production at which the firm maximizes profit?
- 24 (*)
 - 25
 - 48
 - 50
55. Olga wants to buy a sack of lemons from Igor but has doubts about the freshness of Igor's lemons. To obtain additional information about the lemons, Olga asks if she can try one of them before purchasing one. Olga's situation is an example of what type of asymmetric information, and what is her request an example of?
- Moral hazard, signaling
 - Adverse selection, signaling
 - Moral hazard, monitoring
 - Adverse selection, screening (*)

56. Which of the following is not an automatic stabilizer?
- Taxes
 - Unemployment and welfare benefits
 - Balanced-budget policies (*)
 - Government expenditures
57. All of the following are reasons that monopolistically competitive markets are not socially efficient except:
- Marginal costs exceed price (*)
 - Product-variety externality
 - Business-stealing externality
 - Presence of deadweight loss
58. Which of the following is not an example of a limitation of the purchasing-power parity model of exchange rates?
- Electric power and haircuts are local, nontradable goods/services
 - People do not necessarily have bank holdings only in a single currency (*)
 - Consumers prefer German pianos to Japanese pianos
 - People consider Japanese cattle and Argentinian cattle to be equivalent goods
59. DSGE stands for:
- Dynamic strategic global equilibrium
 - Dynamic stochastic general equilibrium (*)
 - Demand stabilizing Gilbert equilibrium
 - Demand-supply golden equilibrium
60. The Engel curve plots the relationship between which two variables?
- Price and Demand
 - Income and Demand (*)
 - Population and accumulated income
 - Tax rate and tax revenue