Final Exam
Solutions

ECON 101

Summer I 2016

Name: _____

ONYEN: _____

PID: _____

Honor Code Signature: _____

This exam consists of 50 multiple choice questions and 1 short answer question. Multiple choice questions should be bubbled in on a scantron. Extra paper for scratch work is attached. The total number of points available on this exam is **100**.

Multiple Choice [1.5 pts each]

Choose the option that best answers the question given.

1. Consider Table 1.

Table 1: Production in Utopia

t	k	y	i	d	$\hat{y}$
0			x	y	—
1					$-.45\%$
2					z

Under the assumptions of the Solow Model, which of the following is true?

(a) $x > y$ and $z > -.45\%$

(b) $x < y$ and $z > -.45\%$

(c) $x > y$ and $z < -.45\%$

(d) $x < y$ and $z < -.45\%$

Solution: If output growth is negative in period 1, then it must be that $i < d$ in period 0. Output growth approaches zero as the country moves towards its steady state, so $z > -.45\%$.

2. Suppose the supply curve for coffee mugs shifts such that the market price of coffee mugs decreases. Which of the following statements must be true?

   i. Producer surplus decreases due to the lower price of neck ties.

   ii. Consumer surplus increases as existing buyers in the market pay lower prices on the neck ties they were already willing to buy.

   iii. New buyers enter the market as a result of the price decrease and realize surplus.

   (a) i, ii, and iii

   (b) i and iii

   (c) i and ii

   (d) ii and iii

Solution: If supply shifts such that the price of mugs decreases, then supply for mugs increased. The decrease in price will increase surplus to consumers already in the market and will also yield surplus to new consumers entering the market. The effect on producer surplus is ambiguous: The price of mugs is lower, but seller costs decreased and there are more transactions taking place so PS could increase.

3. Refer to Figure 1.

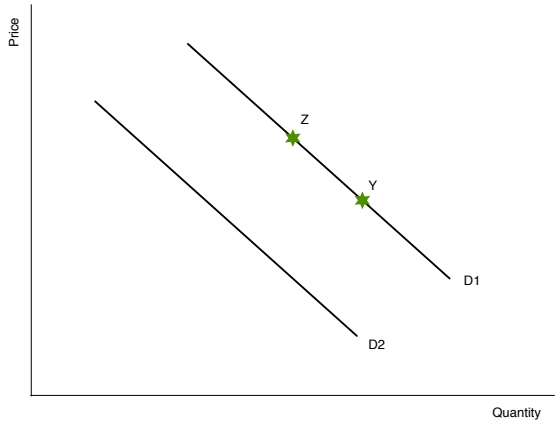

Figure 1: Demand for Beer

If the cross-price elasticity between beer and sausage is $-.45$, then an increase in the price of sausage will cause a move from

(a) Z to Y

(b) D2 to D1

(c) D1 to D2

(d) Y to Z

Solution: If the cross-price elasticity between beer and sausage is negative, then the goods are complements. An increase in the price of sausage will decrease demand for beer.

4. Maple Leaf farm currently produces 1,000 bottles of syrup. The average total cost at this level of production is \$5.50, while the marginal cost of production is \$4.00. If the firm decides to increase production to 1,001 units, then the _____at 1,001 units must be _____.

   (a) ATC; greater than \$5.50
   (b) MC; less than \$4.00
   (c) MC; greater than \$5.50
   (d) ATC; less than \$4.00
   (e) None of the above.

   Solution: If $ATC < MC$, then the average total cost must be decreasing. Thus, $ATC < \$5.50$.

5. A country can produce either guns or butter and their production possibilities frontier is bowed out. If the country moves from a point where they are producing 25 guns and 30 pounds of butter to one where they are producing 35 guns and 30 pounds of butter, how many of the following statements could account for this?

   i. The country saw an influx of workers who specialize in making butter and moved from an efficient point on their former PPF to an efficient point on their new PPF.
   ii. A technological breakthrough in gun production allowed the country to move from an efficient point on their former PPF to an efficient point on their new PPF.
   iii. The country moved from an efficient point on their PPF to another efficient point on the same PPF.
   iv. The country moved from an inefficient point within their PPF to an efficient point on their PPF.

   (a) 0
   (b) 1
   (c) 2
   (d) 3
   (e) 4

   Solution: If the country is able to produce more guns without giving up any butter, then it cannot be moving along its PPF. i, ii, or iv could account for this, but not iii.

6. You decide to put \$500 dollars into a savings account advertising 2% annual interest. After a year, you withdraw your money and have to pay a tax of 20% on your interest earnings. If inflation over the year was 1.75%, then your after-tax nominal interest rate was _____and your purchasing power _____.

   (a) .35%; increased
   (b) .6%; decreased
   (c) 1.6%; decreased
   (d) .35%; decreased
   (e) 1.6%; increased

Solution: After-tax nominal interest rate = $2\% \times (1 - .2) = 1.6\%$. After-tax real return = 1.6% - 1.75% < 0, so your purchasing power decreased.

7. Bruce's Chum Shop calculates that changing the price of bait from \$2.10 to \$2.00 will increase their bait sales by 6%. If they decide to go through with the price change, then their total revenue will
   (a) decrease because demand for bait is inelastic.
   (b) increase because demand for bait is elastic.
   (c) increase because demand for bait is inelastic.
   (d) decrease because demand for bait is elastic.

Solution: $\%\Delta P = (2.10 - 2)/2.05 \times 100\% = 4.9\% < \%\Delta Q_d \Rightarrow$ Demand is elastic. Decreasing the price will increase total revenue.

Use Table 2, which shows how many hats or shirts Ben and Jerry can produce in a day, to answer questions 8 - 9.

Table 2: Daily Production of Hats and Shirts

	Hats	Shirts
Ben	15	10
Jerry	12	9

Solution: Ben: 15 hats : 10 shirts $\Rightarrow$ 1 shirt : 1.5 hats.
Jerry: 12 hats : 9 shirts $\Rightarrow$ 1 shirt : 1.33 hats.
Jerry has CA in shirts, Ben has CA in hats. Jerry will export shirts and import hats.
Terms of trade: 1 shirt : X hats.
Jerry only better off if $X > 1.33$, Ben only better off if $X < 1.5$.
Acceptable terms of trade: $1.33 < X < 1.5$.

8. Which of the following statements is TRUE?
   (a) Ben has an absolute advantage in producing both shirts and hats, but Jerry has a comparative advantage in producing hats.
   (b) Ben has a comparative advantage in producing shirts, while Jerry has a comparative advantage in producing hats.
   (c) Ben has an absolute advantage in producing shirts, but a comparative advantage in producing hats.
   (d) None of the above are true.

9. Suppose a terms of trade is given where 150 shirts will be exchanged for 270 hats. Is this an acceptable terms of trade for both parties?
   (a) No. Ben would be worse off.
   (b) No. Both parties would be worse off.

(c) No. Jerry would be worse off.

(d) Yes. Both parties would be better off.

Solution: TOT: 150 shirts : 270 hats $\Rightarrow$ 1 shirt : 1.8 hats. Jerry would be better off under these terms, but Ben would be worse off.

10. Zuutopia experienced negative growth of real GDP per capita in the last year. Which of the following can explain this?

(a) The country's population shrunk over the last year while real GDP remained the same.

(b) The country's population grew over the last year while real GDP also increased but by a greater percentage.

(c) The country's population remained the same over the last year while real GDP increased.

(d) The country's population grew over the last year while real GDP also increased but by a smaller percentage.

Solution: $\hat{y} \approx \hat{Y} - \hat{N}$. If real GDP per capita fell over the last year, then $\hat{Y} < \hat{N}$. (d) is the only choice for which this holds true.

11. Which of the following is an example of a negative real shock?

(a) Consumers become pessimistic about the economy and spend less.

(b) A hurricane destroys numerous factories along the shoreline.

(c) The Federal Reserve is concerned about inflation and decreases the money supply.

(d) The government increases taxes on consumers.

(e) All of the above.

Solution: See class notes.

12. Refer to Figure 2.

Which of the following statements is correct?

(a) $\pi_0 + \pi_1 = \vec{Y_0} + \vec{Y_1}$.

(b) $\pi_0 + \vec{Y_1} = \pi_1 + \vec{Y_0}$.

(c) $\pi_0 + \vec{Y_1} = \vec{M} + \vec{v}$.

(d) $\pi_1 + \vec{Y_0} = \vec{M} + \vec{v}$.

(e) None of the above.

Solution: Along the given AD curve, spending growth $= \vec{M} + \vec{v} = \pi_0 + \vec{Y_0} = \pi_1 + \vec{Y_1}$.

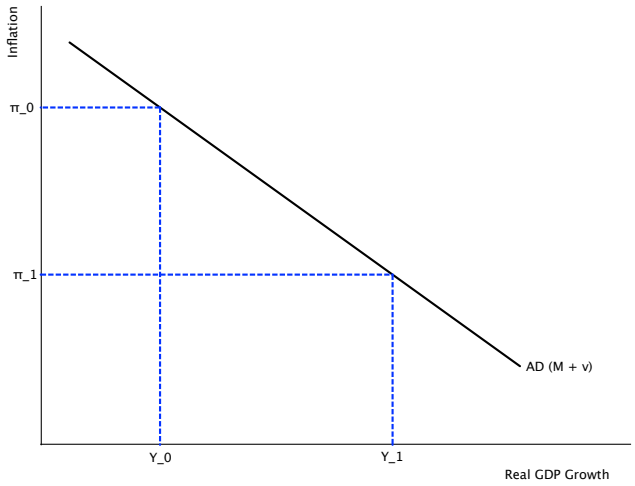

Figure 2: Aggregate Demand Curve

13. Jack loses his job working as a consultant and decides to take time off to explore Europe. Jill has been looking for work for some time, but gave up looking for a job 2 months ago. Given this, Jack's actions will _____the employment rate while Jill's will _____the unemployment rate.

    (a) increase; decrease
    (b) increase; increase
    (c) decrease; increase
    (d) decrease; decrease
    (e) None of the above

    Solution: Jack goes from employed to out of the labor force: #U remains the same, while #LF falls $\Rightarrow$ unemployment rate = #U/#LF will increase.
    Jill goes from unemployed to out of the labor force: #U & #LF both decrease. Unemployment rate will increase since change in numerator will have a bigger effect.

14. It takes Hannah 2 hours to bake a cake, while a batch of chocolate chip cookies takes 30 minutes to make. The opportunity cost to Hannah of making a batch of chocolate chips cookies is

    (a) 1/15 cake.
    (b) 4 cakes.
    (c) 15 cakes.
    (d) 1/4 cake.

    Solution: 1 cake/120 minutes : 1 batch of cookies/30 minutes $\Rightarrow$ 1 batch of cookies : 30/120 cakes $\Rightarrow$ 1 batch of cookies : 1/4 cake.

15. Suppose the Fed sets the minimum reserve ratio at 25%. If banks choose to hold excess reserves and the Fed increases the money supply by \$5 million, then the maximum amount the money supply could potentially increase is

(a) exactly \$20 million.

(b) more than \$20 million.

(c) more than \$20 million but less than \$125 million.

(d) more than \$125 million.

(e) None of the above.

Solution: If banks hold excess reserves, then $rr > .25 \Rightarrow MM < 5$, so the potential increase in the MS is less than \$20 million.

16. The production function $F(K, L)$ has the property such that $F(3K, 3L) = 3F(K, L)$. What is this property called?

(a) Increasing returns to scale.

(b) Constant returns to scale.

(c) Diminishing marginal returns.

(d) Decreasing returns to scale.

Solution: See class notes.

17. Cosmic is a firm in a perfectly competitive environment outlined in Figure 3.

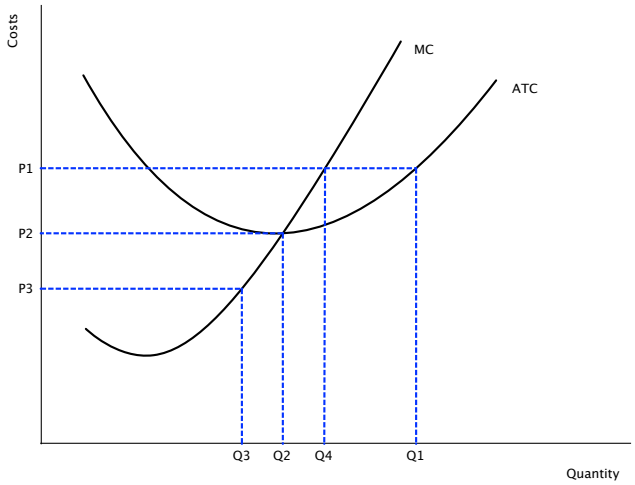

Figure 3: Environment Faced by Cosmic

If the price in the market is $P1$, then the firm will choose to produce _____units of output. Additionally, the long-run price in the market will be _____.

(a) $Q1$; $P2$

(b) $Q2$; $P3$

(c) $Q1$; $P1$

(d) $Q4$; $P2$

(e) None of the above.

Solution: Produce Q where $P = MC$. Long-run price is at min ATC.

18. The equilibrium price for bobble head pumpkins is \$1.25. Suppose that the government imposes a price ceiling of \$1.00. Due to this price ceiling, producer surplus will _____and total surplus will _____.

    (a) decrease; decrease
    (b) increase; decrease
    (c) decrease; increase
    (d) increase; increase
    (e) remain unchanged; remain unchanged

    Solution: The price ceiling is below the market price, so it is binding. This will decrease both PS and TS in the market.

19. Consider Table 3.

    Table 3: Market for Pencils

WTP	Seller Cost
\$6.25	\$1.00
\$4.00	\$3.00
\$3.50	\$3.25
\$3.40	\$3.40
\$3.00	\$4.00

    If the government imposes a per unit tax of \$1 on pencil sellers, then the quantity bought and sold will be _____and _____.

    (a) 2; sellers will bear more of the tax burden.
    (b) 5; sellers will bear more of the tax burden.
    (c) 2; buyers will bear more of the tax burden.
    (d) 2; buyers and sellers will split the tax burden evenly.
    (e) 4; buyers will bear more of the tax burden.

    Solution: New quantity: 2 (tax wedge = \$1). Buyers now pay \$4, sellers receive \$3. Buyers bear \$.60 of the tax, sellers bear \$.40.

20. A closed economy has private savings equal to \$500 billion and public savings of −\$20 billion. If consumption in the economy is \$400 billion and taxes equal \$50 billion, then government spending is _____billion and total spending (i.e., GDP) in the economy is _____billion.

    (a) \$50; \$950
    (b) \$70; \$900
    (c) \$30; \$600
    (d) \$70; \$950

Solution: Public savings: $T - G = 50B - G = -20B \Rightarrow G = 70B$.
Private savings: $Y - C - T = Y - 400B - 50B = 500B \Rightarrow Y = 950B$.

21. If the government wishes to enact contractionary fiscal policy, it could
    (a) increase both taxes and government spending.
    (b) reduce taxes or increase government spending.
    (c) decrease both taxes and government spending.
    (d) increase taxes or reduce government spending.

    Solution: See class notes.

22. A firm operates in the market environment shown in Table 4.

    Table 4: Market for Jello

P	Q_d	Total Cost
\$6.25	0	\$2
\$4.00	2	\$3
\$3.00	4	\$6
\$2.50	6	\$10
\$1.00	8	\$16

    The firm should produce _____units of output and will make _____in profit.
    (a) 4; \$6
    (b) 6; \$5
    (c) 4; \$12
    (d) 6; \$15
    (e) None of the above.

    Solution: Find where MR = MC. $Q^* = 4$, $\Pi = TR - TC = \$6$.

23. Refer to Figure 4.

    The socially efficient quantity is _____, but in the absence of government intervention the market will have a deadweight loss of _____.
    (a) 6; \$10
    (b) 8; \$20
    (c) 8; \$10
    (d) 6; \$20

    Solution: Social efficient point where sv curve = supply curve. DWL $= (1/2) \times 2 \times 10 = 10$.

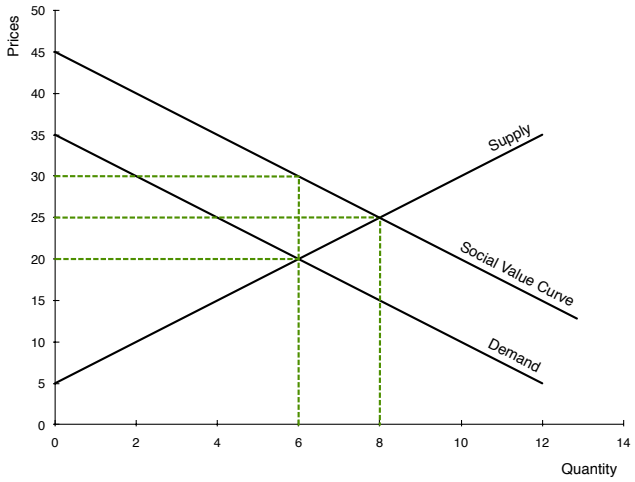

Figure 4: A Market Externality

24. How many of the following will lead to bias in the unemployment rate?

    i. Woody leaves his job at UNC and starts his own toy shop business.

    ii. Morgan wishes to have a job, but stopped looking for work due to few call backs.

    iii. Jonathan isn't actively looking for work, but claims to do so in order to receive unemployment benefits.

    iv. Allen is fired from his job at McDonald's and immediately begins looking for work at other fast food joints.

    (a) 0

    (b) 1

    (c) 2

    (d) 3

    (e) 4

    Solution: See class notes. ii and iii will lead to bias in the unemployment rate.

25. You buy a bond today that promises to pay \$50 in one year, \$50 in two years, and \$1,050 in three years. If the market interest rate is 6% and remains so for the next three years, which of the following represents the price of the bond if you decide to sell it in one year after receiving the first \$50 payment?

    (a) $P = \frac{\$50}{(1.06)} + \frac{\$50}{(1.06)^2} + \frac{\$1{,}050}{(1.06)^3}$

    (b) $P = \frac{\$50}{(1.06)} + \frac{\$1{,}050}{(1.06)^2}$

    (c) $P = \$50 + \frac{\$50}{(1.06)} + \frac{\$1{,}050}{(1.06)^2}$

    (d) $P = \$50 + \frac{\$1{,}050}{(1.06)}$

    (e) None of the above.

Solution: See class notes. The price of a bond is the present value of its future payments.

26. Which of the following is NOT a determinant of a country's long-run productivity?
    (a) Human capital
    (b) Technological knowledge
    (c) Money supply
    (d) Natural resources

    Solution: See class notes.

27. Suppose the government increases its purchases by 4%. If the multiplier effect is greater than the crowding out effect, then
    (a) the aggregate supply curve shifts to the right by more than 4%.
    (b) the aggregate supply curve shifts to the left by less than 4%.
    (c) the aggregate demand curve shifts to the right by more than 4%.
    (d) the aggregate demand curve shifts to the left by more than 4%.

    Solution: An increase in govt. spending increases AD. If the multiplier effect is greater than the crowding out effect, AD will shift by more than the change in govt. spending.

28. Which of the following is true with regard to the pricing and production decisions of firms in monopolistically competitive markets? Monopolistically competitive firms produce
    (a) at the efficient scale and charge a price equal to marginal cost.
    (b) at the efficient scale and charge a price above marginal cost.
    (c) with excess capacity and charge a price equal to marginal cost.
    (d) with excess capacity and charge a price above marginal cost.

    Solution: See class notes.

29. How many of the following situations would unambiguously decrease the equilibrium price of milk today, which is a normal good?
    i. A technological advance allows milk farmers to produce milk at a lower cost.
    ii. A prominent basketball player joins a new campaign that promotes the benefits of drinking milk.
    iii. A famine wipes out half of milk producing cows.
    iv. Both consumers and producers hear news that the price of milk will be lower next month.
    (a) 0
    (b) 1
    (c) 2
    (d) 3
    (e) 4

Solution: In order for the price of milk to fall, the supply of milk must increase, the demand for milk must decrease, or both must occur simultaneously. i and iv are the two options where this occurs.

30. David is debating how many beers he should buy after grading his Econ 101 final exams. Table 5 shows his willingness to pay for each additional beer as well as the total cost of each beer which includes the price of the beer along with the dollar cost of headache medicine, lost time, etc. each beer would have.

Table 5: WTP and Costs of Beer

Beer	WTP	Total Cost
1st	\$6.00	\$4.50
2nd	\$6.00	\$9.50
3rd	\$5.50	\$15.00
4th	\$5.25	\$21.00
5th	\$5.00	\$27.50
6th	\$4.50	\$34.50

Given this information, how many beers should he buy?

(a) No more than 1 beer.

(b) Exactly 2 beers.

(c) Exactly 3 beers.

(d) Exactly 4 beers.

(e) At least 5 beers.

Solution: WTP = MB of each beer. Use TC to find MC. Optimal amount is where $MB = MC = \$5.50$ at $Q = 3$.

31. Which of the following statements regarding elasticity is FALSE?

(a) If the income elasticity of demand for some good is $-.75$, an increase in incomes will increase the quantity demanded for that good.

(b) A relatively elastic supply curve will have a smaller slope than a relatively inelastic supply curve.

(c) A perfectly inelastic demand curve implies that the price elasticity of the good is zero.

(d) Due to the Law of Supply, the price elasticity of supply is always positive.

(e) If the cross-price elasticity between two goods is positive, then an increase in the price of one will lead the an increase in quantity demanded for the other.

Solution: See class notes.

32. Refer to Figure 5.

Expected inflation at point A is _____, which is _____actual inflation.

(a) 2%; greater than

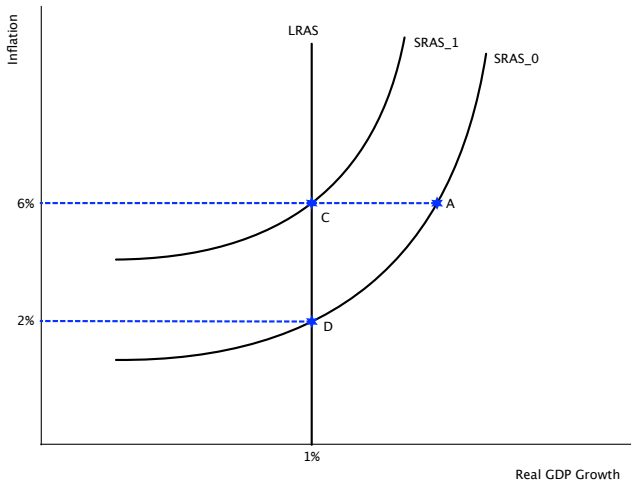

Figure 5: SRAS and LRAS

(b) 6%; equal to

(c) 6%; greater than

(d) 2%; less than

Solution: Expected inflation is where SRAS and LRAS meet. $\pi^e = 2\%$ on $SRAS_0$, which is less than actual inflation of 6% at point A.

33. Suppose you lend your roommate \$100 for one year at 12% nominal interest. You both expect the real interest rate on the loan to be 9%. If at the end of the loan wealth was transferred from your roommate to you, then actual inflation over the course of the year could have been

(a) 0%.

(b) 7%.

(c) 9%.

(d) 14%.

(e) Either (a) or (b).

Solution: $i = r^* + \pi^e \Rightarrow \pi^e = i - r^* = 3\%$. If wealth is transferred from your roommate (borrower) to you (lender), then $\pi < \pi^e$ and so $\pi < 3\%$.

34. A country's output per worker is described by the function $y = 2\sqrt{k}$. Capital depreciates at a rate of 2% and the labor force remains the same each period. If the country sets a savings rate of 30%, what will be the level of output per worker once the country reaches its steady state?

(a) 900

(b) 45

(c) 60

(d) 30

Solution: Steady state where $i = d$. $i = sy = .30(2\sqrt{k})$ and $d = \delta k = .02k \Rightarrow .6\sqrt{k} = .02k \Rightarrow k^* = (.6/.02)^2 = 900$. $y^* = 2\sqrt{900} = 60$.

35. Refer to Table 6, which gives the willingness to pay for a Bun's milkshake for four individuals.

Table 6: WTP for Milkshakes

Buyer	WTP
Buster	\$4.00
Michael	\$2.50
Lindsey	\$3.00
Gob	\$.50

Suppose the price of milkshakes decreases from \$3.50 to \$2.00. The change in total consumer surplus that is due to buyers entering or exiting the market because of the price change is

(a) \$1.00.

(b) \$3.00.

(c) \$4.50.

(d) \$1.50.

Solution: Buys as long as $WTP > P$. At $P_0 = \$3.50$, only Buster is willing to buy a milkshake and realizes surplus of (4 - 3.50) = \$.50. At $P_1 = \$2$, Buster, Michael, and Lindsey are all willing to purchase and realize consumer surplus of (4 - 2) + (2.50 - 2) + (3 - 2) = \$3.50. Increase in surplus from Buster (old buyer): \$1.50. Increase in surplus due to new buyers: \$1.50.

36. Which of the following is NOT an issue when implementing monetary policy?

(a) Legislative lag

(b) Effectiveness lag

(c) Imperfect control over the money supply

(d) Implementation lag

Solution: See class notes.

37. There are two polluting firms, firm A and firm B, in the town of Wooten. The government decides to curtail pollution by distributing pollution permits to each firm which can be traded between the firms. If firm B buys all the pollution permits from firm A, which of the following is true?

(a) Firm A has a higher cost of reducing pollution than firm B.

(b) Firm B has a higher cost of reducing pollution than firm A.

(c) The two firms have the same cost of reducing pollution.

(d) Comparing the firms' pollution costs is impossible without more information.

Solution: See class notes. The firm with a higher cost of reducing pollution will buy permits from the firm with lower costs.

38. Which of the following accurately describes the relationship between the price, average total cost, and average variable cost for a firm in a perfectly competitive market given that the firm is currently producing output, but is making a loss?

    (a) $P > ATC > AVC$
    (b) $ATC > AVC > P$
    (c) $ATC = P > AVC$
    (d) $ATC > P > AVC$

    Solution: Firm operates, but makes a loss if $AVC < P < ATC$ at the optimal quantity.

39. Table 7 shows the prices and quantities produced and consumed of the only two goods in Uzbeki-beki-beki-Stan-Stan, grapes and olives, for the years 2000 – 2002.

    Table 7: Grapes and Olives in UZN

Year	Grapes	Price of Grapes	Olives	Price of Olives
2000	20	\$2.10	4	\$4.10
2001	19	\$2.25	6	\$4.15
2002	22	\$2.20	7	\$4.15

    Using 2000 as the base year, real GDP in 2001 was _____, while nominal GDP in 2002 was _____.

    (a) \$61.60; \$77.45
    (b) \$67.65; \$74.90
    (c) \$64.50; \$77.45
    (d) \$61.60; \$74.90
    (e) \$64.50; \$74.90

    Solution: Base yr: 2000. Real GDP is calculated using base year prices and current production, while nominal GDP is calculated using current year prices and production.
    Real GDP 2001: $19 \times (\$2.10) + 6 \times (\$4.10) = \$64.50$.
    Nominal GDP 2002: $22 \times (\$2.20) + 7 \times (\$4.15) = \$77.45$.

40. Suppose your Aunt Stella gives you \$500 in cash. The minimum reserve requirement set by the Fed is 10%, but banks choose to hold 12.5% in reserves. What is the maximum potential *increase* in the money supply if you choose to hold half your cash as a demand deposit?

    (a) \$1,750
    (b) \$2,000
    (c) \$2,250
    (d) \$2,500

Solution: $MM = 1/rr = 1/.125 = 8$. Deposit \$250 $\Rightarrow$ max $\Delta MS = \$250 \times 8 - \$250 = \$1{,}750$ (since you removed \$250 in currency).

41. Assume an economy has a natural growth rate of 4% and is currently at its long-run equilibrium. If spending growth along the current AD curve is 4%, then inflation must be _____. Additionally, actual inflation is currently _____expected inflation.

    (a) 8%; equal to

    (b) 0%; less than

    (c) 8%; greater than

    (d) 0%; equal to

    (e) None of the above.

42. Suppose a wave of investor and consumer optimism has increased spending growth so that current output growth exceeds the long-run natural growth rate. If policymakers choose to engage in activist contractionary policy, they should

    (a) decrease taxes, which will shift aggregate demand to the left.

    (b) decrease government spending, which will shift aggregate demand to the left.

    (c) decrease government spending, which will shift aggregate demand to the right.

    (d) decrease taxes, which will shift aggregate demand to the right.

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2001	19	\$2.25	6	\$4.15
2002	22	\$2.20	7	\$4.15

Assuming the typical basket of grapes and olives is determined by the quantity of each consumed in 2000, then the price level in 2001 used to compute the CPI is _____.

    (a) \$67.65

    (b) \$64.50

    (c) \$58.40

    (d) \$61.60

Solution: Price level calculated is using current year prices and fixed basket of goods. $P_{2001} = \$2.25 \times (20) + \$4.15 \times (4) = \$61.60$.

44. In the presence of a savings tax credit, how many of the following are FALSE?

    (i) The real interest rate will increase.

    (ii) The quantity of investment will decrease.

(iii) The quantity of savings will increase.

(a) 0

(b) 1

(c) 2

(d) 3

Solution: A savings tax credit will increase the supply for loanable funds. As a result, the real interest rate will decrease, while both savings and investment will increase.

45. Use the game matrix below to answer the question that follows.

		Isabella		
		Run	Walk	Crawl
Noah	Run	2, 1	4, 4	8, 2
	Walk	3, 0	1, 3	2, 2
	Crawl	3, 4	5, 5	4, 4

Which of the following statements are TRUE?

i. Noah does not have a dominant strategy.

ii. Isabella does not have a dominant strategy.

iii. This game has no Nash equilibrium.

(a) Only i

(b) Only i and iii

(c) Only ii and iii

(d) i, ii, and iii

(e) None of the statements are true

Solution: Noah does not have a dominant strategy. Isabella's dominant strategy is Walk. Noah's best response to this is Crawl, and so the NE is (Crawl, Walk).

46. Sweet Dee's Ostrich farm can currently produces 500 ostrich eggs per day with 50 workers. If Dee hires 100 more workers, she can increase egg production by 1,000 eggs. The marginal product of labor per worker from these additional laborers is

(a) 1,000.

(b) 10.

(c) 100.

(d) 15.

Solution: $MP_L = \Delta Q/\Delta L = 1,000/100 = 10$.

47. When an increase in government spending increases the income of some people, and those people spend some of that increase in income on additional consumer goods, we have seen a demonstration of

    (a) the investment accelerator.

    (b) the multiplier effect.

    (c) the crowding out effect.

    (d) supply-side economics.

    Solution: See class notes.

48. If GDP in Denmark was \$20,000 in 1988 and \$80,000 in 2016, then the country's *annual* growth rate was approximately _____during this period.

    (a) 2.5%

    (b) 300%

    (c) 25%

    (d) 5%

    Solution: Quadruple time: $2(70/g) = 140/g = (2016\text{-}1988) = 28 \Rightarrow g = 140/28 = 5\%$.

49. Consider Figure 6.

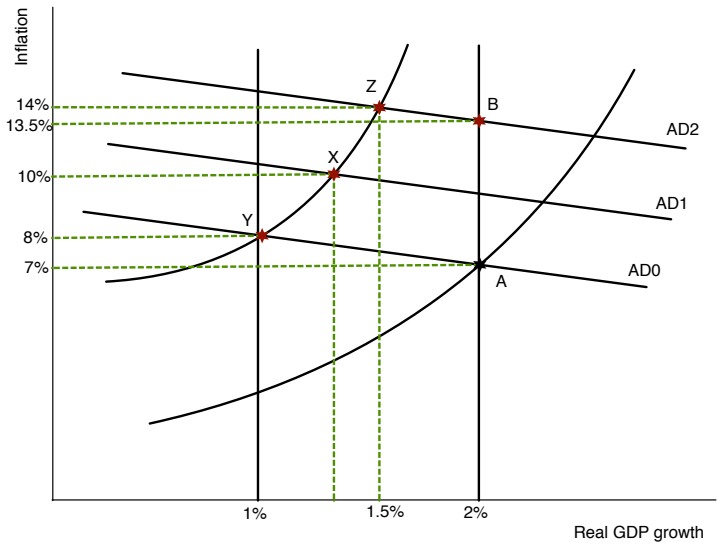

Figure 6: Real Shock

If after a real shock the economy is operating at point Y, then, in the absence of crowding out, fiscal policy that shifted $AD0$ to $AD2$ would lead to inflation of _____in the short run.

(a) 14%
(b) 10%
(c) 13.5%
(d) 8%

Solution: Real shock moved LRAS curve from $g = 2\%$ to $g = 1\%$. Long-run Eq at $AD0$ is Y. If AD shifts to $AD2$, economy would be where $AD2$ and the new SRAS curve intersect at point Z.

50. Consider Figure 7.

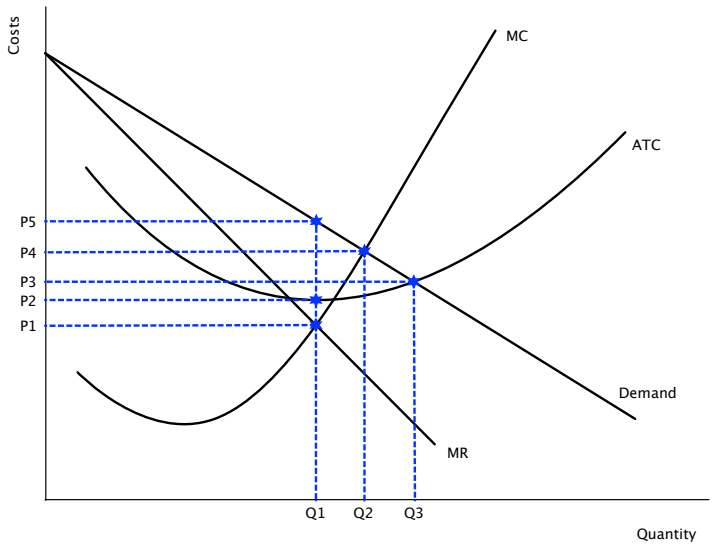

Figure 7: Monopolist Environment

Which of the following represents the monopolist's profit at their optimal production level?

(a) $(P5 - P1) \times Q1$
(b) $(P4 - P2) \times Q2$
(c) $(P5 - P2) \times Q1$
(d) $(P3 - P2) \times Q3$

Solution: Produce at $Q1$ since that's where $MR = MC$. Charge $P5$ on demand curve. ATC at $Q1$ is $P2$.

Short Answer

For this section, make sure to write legibly and box final answers. **Show your work!** This can be done within the section or *clearly* labeled on the scratch paper provided.

1. Suppose that an economy has a natural growth rate of 1%. Moreover, the central bank in the country has perfect control over the money supply and increases it by 3% every year. The economy's growth rate of real GDP is currently -2% and inflation is 1%. Assume that any changes leading to the current rate of output growth and inflation are permanent.

(a) Is the economy currently at its long-run equilibrium? Explain why or why not. **[2 pts]**

Solution: No. The current rate of output growth is less than the long-run natural growth rate of the economy.

(b) What is current spending growth in the economy? **[2 pts]**

Solution: Spending growth $= \vec{M} + \vec{v} = \pi + \vec{Y}_R = 1\% + (-2\%) = -1\%$.

(c) What is the current rate of velocity growth? **[2 pts]**

Solution: $\vec{M} + \vec{v} = -1\% \Rightarrow \vec{v} = -1\% - (3\%) = -4\%$.

(d) What is the relationship between expected inflation and actual inflation at the point the economy is currently operating (i.e., which one is greater)? **[2 pts]**

Solution: Expected inflation is greater than actual inflation.

(e) Discuss how your answer to (d) relates to the economy's current rate of output growth. **[4 pts]**

Solution: Since $\pi^e > \pi$, firm profits are falling (e.g., wages rising faster than prices) and thus short-run growth is below the natural growth rate of output.

(f) In the absence of monetary or fiscal policy interventions, what will the growth rate of output and inflation rate be in the long run? **[2 pts]**

Solution: In the long run, $\vec{Y}_R = g = 1\%$. Since spending growth is -1%, inflation in the long run must be -2%.

(g) Suppose the central bank wishes to bring the economy back to its original long run equilibrium where long-run inflation was 2%. State two policies they could enact in order to achieve this goal. **[2 pts]**

Solution: In order to increase AD, the central bank must increase $\vec{M}$. To do so, they can (i) engage in open market purchases, (ii) decrease the discount rate, (iii) decrease interest on reserves, (iv) decrease the minimum reserve requirement, or (v) decrease the Federal funds rate.

(h) Regardless of the policy pursued, what will be the new rate of money growth the central bank must enact in order to achieve their goal? **[2 pts]**

Solution: Spending growth at the new long-run equilibrium $= 2\% + 1\% = 3\%$. $\vec{M} + \vec{v} = 3\%$, so if $\vec{v} = -4\%$ then $\vec{M} = 7\%$.

(i) Draw a well-labeled AS-AD graph that shows the economy operating at their initial real GDP growth rate of -2% and inflation of 1%, labeling this point A. Make sure to include the AD, SRAS, and LRAS curves. If different, label the long-run equilibrium point in the absence of government intervention point B. Finally, label the long-run equilibrium point if the central bank intervenes as you've described in (g) and (h) point C. *Make sure to clearly show what the inflation rate and rate of output growth is at each point as well as any shifts in the AD, SRAS, or LRAS curves.* **[5 pts]**

Solution:

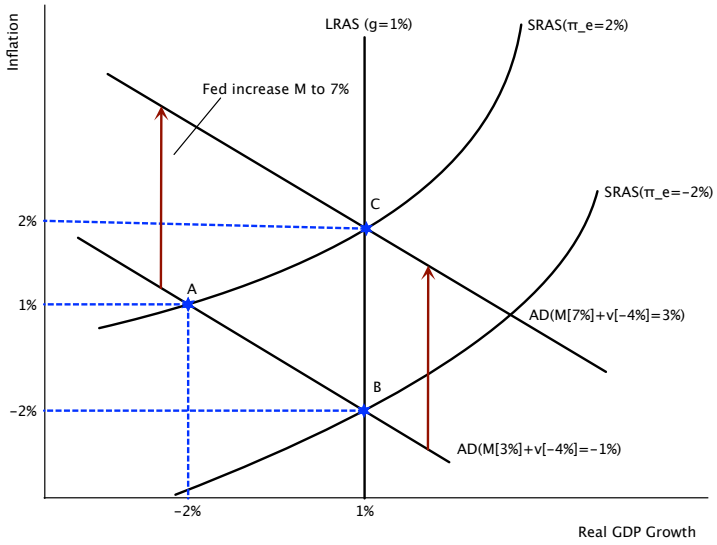

Figure 8: AS-AD Plot

(j) What is the expected inflation rate at points A, B, and C in your plot from (i)? **[2 pts]**

Solution: Expected inflation at A = expected inflation at $C = 2\%$.
Expected inflation at $B = -2\%$.

END OF EXAM

SCRATCH SHEET