Economics 390
Spring 2022
Second Midterm with Answers
April 19, 2022

Name Annotated Key

I understand that this is close book, no notes, no calculator exam.

I understand that providing help to another student or seeking help from another human being on this exam will be considered academic misconduct and that if I engage in this conduct, I will get a zero on this exam.

Signed _____

Binary Choice and Multiple Choice Score: _____

Essay #1 Score: _____

Essay #2 Score: _____

TOTAL SCORE: _____

Binary Choice: 10 questions worth 2 points each

EASY 1. Which of the following goods exemplifies an example of a public good?

a. Fireworks at a community park — non-rival and non-excludable
b. National Park with an entry fee of $10 per family
↳ fee makes this excludable

EASY 2. Economists talk about "poor quality drives out the good". This phrase is referencing the idea of:

a. Adverse selection. → e.g. The "Lemon" Market
b. Moral hazard.

EASY 3. Many cultures teach some form of the Golden Rule: "Do unto others as you would have them do unto you". When I apply this rule, I am implicitly assuming that:

a. The other person's tastes and preferences are the same as mine.
b. I take into account the other person's tastes and preferences before I act.
↳ this would be the Platinum Rule

EASY 4. Rosling in the book **Factfulness** writes about syphilis and how this disease was referred to as "the French disease", "the Polish disease", "the Russian disease", …, "the Italian disease". Rosling uses this example to illustrate the:

a. Generalization Instinct.
b. Blame Instinct. Definitional

ABIT OF THOUGHT 5. Consider a city bus service that is currently not facing congestion issues: that is, there are plenty of seats available on the buses that the city operates. In this example, we would measure the marginal cost of an additional rider as being:

a. Some positive number that is less than $1 per additional ride taken on a bus.
b. Zero dollars per additional ride taken on a bus. Since there is excess capacity, the addition to total cost of an additional rider is #0.

EASY 6. Behaviors that are "thoughtless, anti-social, or immoral" typically create:

a. Positive externalities.
b. Negative externalities. Definitional

NOT HARD

7. One solution that is often suggested as a way to eliminate or greatly reduce the impact of negative externalities is to impose an excise tax so that the true cost of the behavior is recognized in a market. Critics of this approach worry that these taxes may:

a. Be quite regressive and cause a greater financial burden on high income individuals than low income individuals. should be low / should be high

b. Result in low income individuals paying a greater proportion of their income with respect to these goods than high income individuals once the excise tax is implemented. This is an accurate statement of regressivity as well as the issue.

EASY

8. Kimberly lives on a three block long street that very few cars travel along. However, on football Saturdays Kimberly's street is full of cars looking for parking spaces. In this case, her street on football Saturdays is:

a. a rival good. Congestion ⇒ rivalry
b. an excludable good.

EITHER YOU KNOW THIS OR YOU DON'T

9. In **Factfulness**, Rosling illustrates the following:

a. the link between level of income and number of babies per woman.
b. the link between religion and the number of babies per woman. There is no link for this despite what people think.

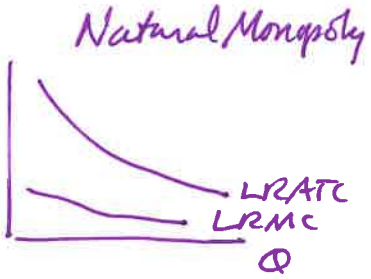
10. According to **Factfulness**, how many of the following statements are true?

EITHER YOU KNOW THIS OR YOU DON'T

I. Health care spending per capita in the United States is two times greater than health care spending per capita in other capitalist countries on Level 4. True
II. The United States spends more on health care per capita than other capitalist countries on Level 4 because the United States, unlike in the other capitalist Level 4 countries, does not have basic public health insurance. True

a. One statement is true.
b. Two statements are true.

↳ I put this question on the exam to educate you - to reenforce these two ideas.



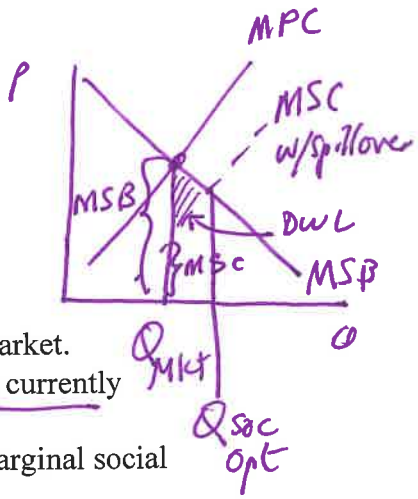
Multiple Choice: 20 questions worth 3 points each

SOME THOUGHT

11. Consider a natural monopoly. Over the relevant region of production:

I. This firm's average total cost curve has a negative slope. True
II. This firm's marginal cost curve lies beneath the firm's average total cost curve as output increases. True
III. This firm experiences decreasing costs and therefore decreasing returns to scale as output increases. False → should be increasing
IV. This firm has big variable costs of production relative to their fixed costs of production. False Firm has big fixed costs

a. All four statements are true.
b. Statements I, II and III are true.
c. Statements I and II are true.
d. Statements I, II and IV are true.



SOME THOUGHT

12. You are told that a market can be described in the following manner:

- The marginal social benefit curve is known to all participants in the market.
- Production of this good generates a positive spillover effect that is not currently internalized in the market.
- Participants decide how much to consume of the good based on the marginal social benefit curve.

Given this information and holding everything else constant, how many of the following statements are true?

I. The market quantity is greater than the socially optimal quantity of the good. False
II. At the current level of production and consumption of this good there is a deadweight loss. TRUE
III. At the market quantity the marginal social cost is greater than the marginal social benefit for the last unit. False
IV. Imposing an excise tax per unit on producers of this good equal to the externality cost per unit is one method of eliminating the externality in this market. False → we need a subsidy, not a tax

a. None of these statements is true.
b. One of these statements is true.
c. Two of these statements is true.
d. Three of these statements is true.

EASY IF YOU UNDERSTAND THE TOPIC

13. Consider a firm that experiences decreasing costs over the relevant region of production. From this information you can conclude that:

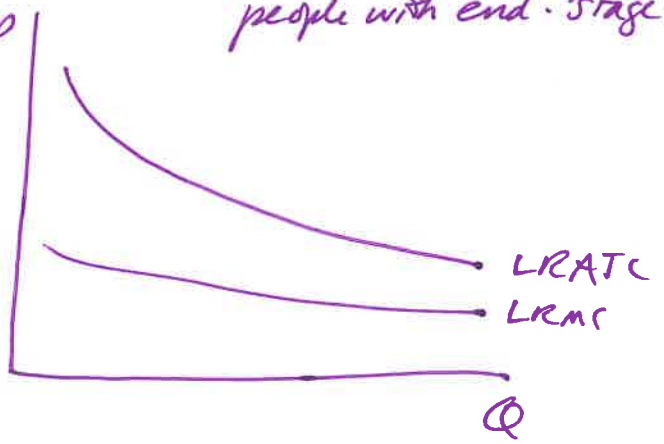
a. It is beneficial for this firm to produce a small amount of output relative to the total market output for this good. No as Q_T, ATC ↓ and overall TC ↓
b. In the market for this product there will be many producers of the good. No, cheaper for one firm to produce the good
c. For this firm, the marginal cost of producing the last unit is greater than the average cost of production for this level of output. No - see graph
(d.) This firm has increasing returns to scale. Yes

DEFN.

14. An individual with end-stage renal disease in the United States if they receive health insurance coverage through a public insurance program is most likely to receive that health insurance from:

a. Medicaid. - insurance for the poor
b. Affordable Care Act (ACA). - not a public insurance program
c. CHIPS. - insurance for children of families that earn too much to qualify for Medicaid, but who do not earn enough to afford insurance
(d.) Medicare.
↳ insurance for elderly, some people with disabilities, and people with end-stage renal disease

13.



SOME THOUGHT

15. Consider two countries: Maitland and Taville. Both countries are concerned about climate change and are considering policies where they would switch from using fossil fuels to using renewable fuels. Maitland estimates that if they switch to using renewable fuels at the same time that Taville also switches to renewable fuels, they will experience a payoff of $50 million per year. Taville estimates that their payoff if both countries switch to renewables will be $75 million. If only Maitland switches to renewables, then Maitland will get a payoff of $30 million and Taville will get a payoff of $100 million. If only Taville switches to renewables, then Taville bill get a payoff of $60 and Maitland will get a payoff of $40 million. If both countries decide to continue to use fossil fuels at their current rate, then Maitland will get a payoff of $45 million and Taville will get a payoff of $70 million.

Given this information and holding everything else constant, how many of the following statements are true?

I. Taville does not have a dominant strategy. False : see below

II. Although Maitland does not have a dominant strategy, Maitland will pursue the strategy of using fossil fuels. True

III. Although Taville does not have a dominant strategy, Taville will pursue the strategy of using fossil fuels. False ↳ Taville has dom. strategy

IV. Both countries have a dominant strategy of using fossil fuels. False : Taville has Dom. Strategy ⇒ Maitland recognizes this & decides to go w/ fossil since that's their best outcome given Taville's Dom. Strategy

a. Two statements are true.
b. Four statements are true.
c. Three statements are true.
d. One statement is true.

	Taville: Keep using fossil	Taville: Switch from fossil Renewables
Maitland: Keep using fossil	45, 70	40, 60
Maitland: Switch from fossil Renewables	30, 100	50, 75

Maitland: X | X

Taville: X | X

Dominant Strategy: Keep using fossil fuels

no dom. strategy

SOME WORK- MAKE SURE YOU ANSWER THE QUESTION ASKED! (b) vs (c)

16. Consider the market for health care. In this market there are two types of consumers: poor consumers and non-poor consumers. The following equations provides the demand for health care from these two groups where P is the price of a unit of health care services and Q is the number of units of health care services:

Demand for health care services from the poor: $P = 200 - Q$
Demand for health care services from the non-poor: $P = 2000 - Q$

You are also told that the supply of health care services is given by the following equation:

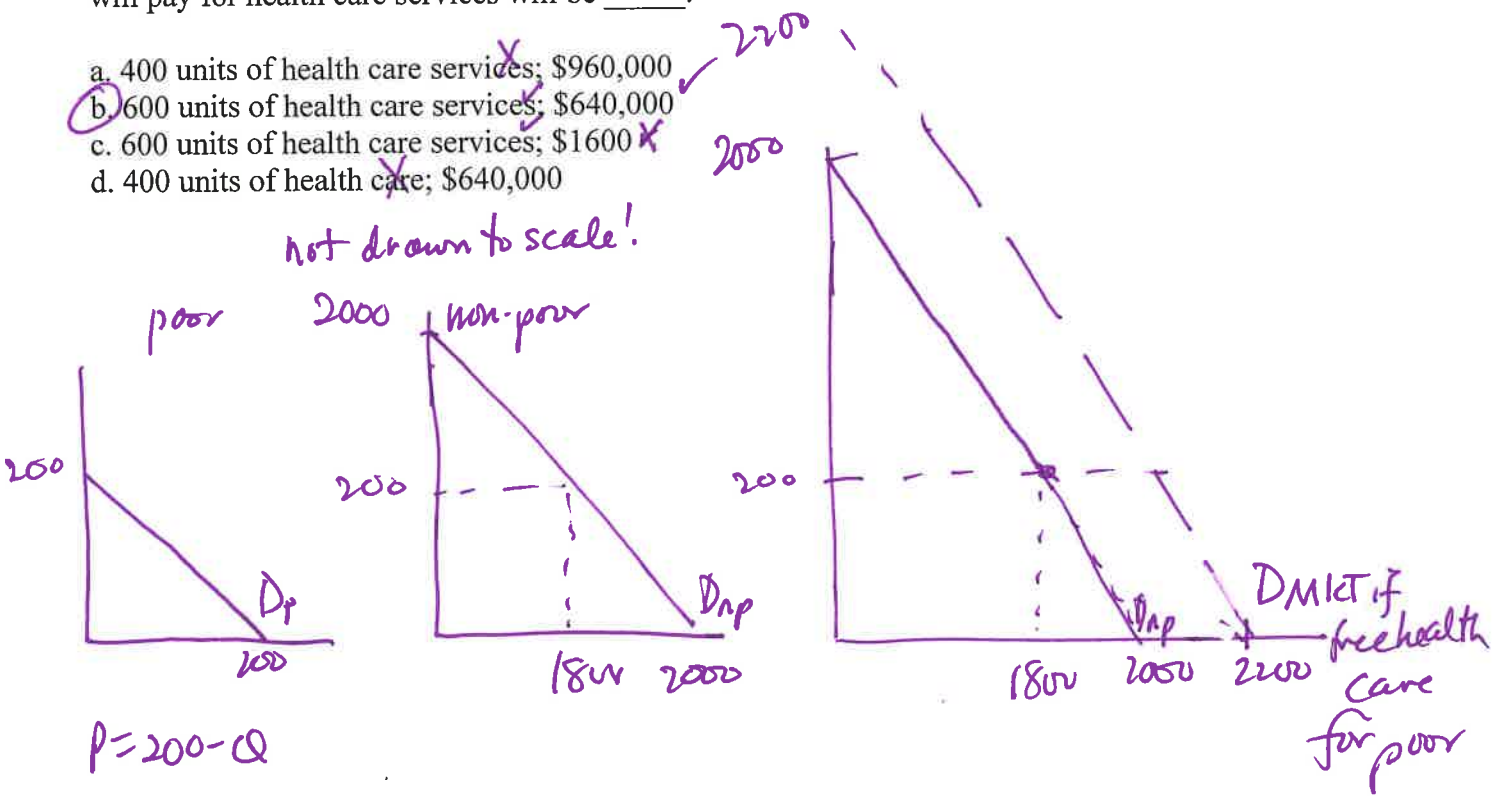
Supply of health care services: $P = 600 + (5/3)Q$

Suppose the government implements a program where they provide free health care services to the poor.

Given this information and holding everything else constant, the equilibrium quantity of health care services for the poor and the non-poor will be ____ and the total expenditure the non-poor will pay for health care services will be _____.

a. 400 units of health care services; $960,000
b. 600 units of health care services; $640,000
c. 600 units of health care services; $1600
d. 400 units of health care; $640,000

not drawn to scale!



$P = 200 - Q$

Total Expenditure$_{np} = (P)(Q_{np})$

TotalExp $= (1600)(400) = \$640{,}000$

Since $Q_{np} = Q_{TOTAL} - Q_{poor}$
$Q_{np} = 600 - 200 = 400$

D_{MKT} w/ program:

$P = 2200 - Q$

$S = D$

$600 + \frac{5}{3}Q = 2200 - Q$

$\frac{8}{3}Q = 1600$

$Q_{TOTAL} = 1600\left(\frac{3}{8}\right) = 600$

$P = 2200 - 600 = \$1600$

Some work

Use the following information to answer the **next three (3)** questions.

Consider the provision of streetlights in a community that has two residents, Bob and Sarah. You are given the following information about this community where P is the price per streetlight and Q is the number of streetlights:

Bob's Demand for Streetlights: $Q = 30 - (3/2)P$
Sarah's Demand for Streetlights: $Q = 15 - 3P$
Marginal Social Cost of Providing Streetlights: $MSC = 1 + Q$

17. Given this information and holding everything else constant, the market demand curve for streetlights can be written as:

a. $Q = 45 - (9/2)Q$ for quantities less than or equal to 15; and $Q = 30 - (3/2)P$ for quantities greater than or equal to 15
b. $Q = 25 - P$ for quantities less than or equal to 15; and $Q = 30 - (3/2)P$ for quantities greater than or equal to 15
c. $Q = 25 - P$ for quantities greater than or equal to 15; and $Q = 30 - (2/3)P$ for quantities less than or equal to 15
d. $P = 20 - (2/3)Q$ for all quantities since Sarah will free ride

18. Given this information and holding everything else constant, how many of the following statements are true?

I. The socially optimal amount of this good is 12 units. True
II. If the socially optimal amount of this good is produced, Bob will contribute a total of \$144 to provide this level of the good. True
III. When the socially optimal amount of the good is produced, Sarah contributes \$1 per unit for the provision of the good. True
IV. The total cost of providing the socially optimal amount of the good is \$156. True

a. One statement is true.
b. Two statements are true.
c. Three statements are true.
d. Four statements are true.

(HARD)

19. Suppose Sarah decides to free ride. Given this information and holding everything else constant, if Sarah free rides then:

a. Sarah will contribute nothing, and Bob will pay the full amount to make sure the socially optimal amount of the good is produced. X $Q_{soc\ opt}$ will not be produced

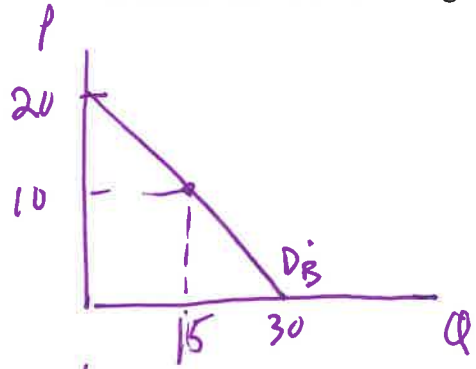
b. Sarah will contribute nothing, and 11.4 units of the good will be provided in this market. ✓

c. There will be no deadweight loss due to Sarah's behavior since Bob will make sure the socially optimal among of the good is produced. X There will be DWL since $Q_{mkt} \neq Q_{soc\ opt}$

d. There will be a deadweight loss due to Sarah's behavior and its value will be greater than $32. No

Yes

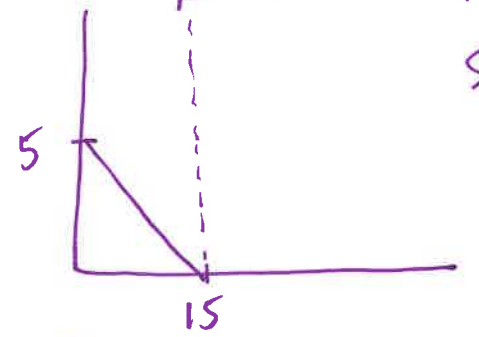
17.



Bob: $Q = 30 - \frac{3}{2}P$

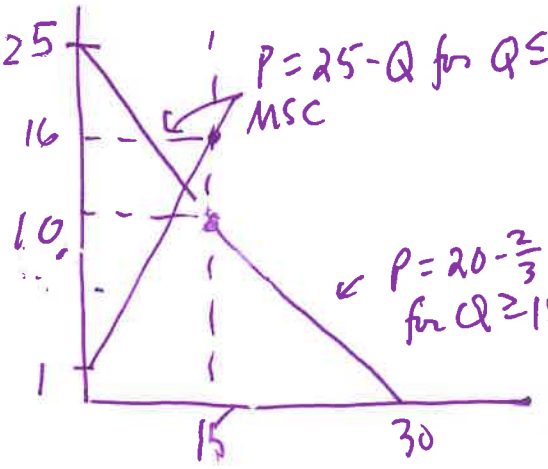
$\frac{3}{2}P = 30 - Q$

$P = 20 - \frac{2}{3}Q$



Sarah: $Q = 15 - 3P$

$P = 5 - \frac{1}{3}Q$



$P = 25 - Q$ for $Q \leq 15$ or $Q = 25 - P$

$P = 20 - \frac{2}{3}Q$ or $Q = 30 - \frac{3}{2}P$ for $Q \geq 15$

if $P = 5 \Rightarrow Q = 30 - \frac{3}{2}(5)$

$Q = \frac{60}{2} - \frac{15}{2} = \frac{45}{2}$

19. If Sarah free rides

MSC = Bob's Demand curve

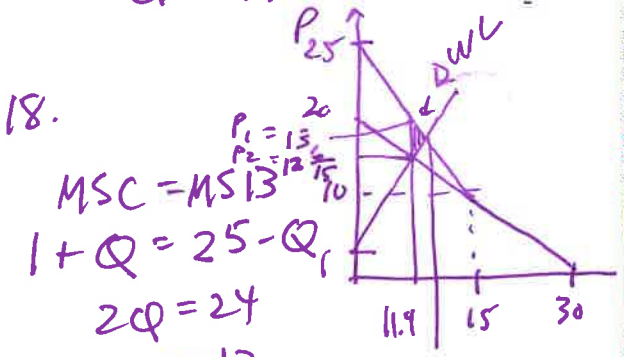
$1 + Q = 20 - \frac{2}{3}Q$

$\frac{5}{3}Q = 19$

$Q = 19\left(\frac{3}{5}\right) = \frac{57}{5}$

$Q = 11.4$

18.



$MSC = MS13$

$1 + Q = 25 - Q_1$

$2Q = 24$

$Q = 12$ ($Q_{soc\ opt}$)

$P_{BOB} = 12$ $P_{SARAH} = 1$

Total Exp by Bob $= 12(12) = \$144$

Total Cost by Providing $Q_{soc\ opt} = 13(12) = \$156$

19. $DWL \approx \frac{1}{2}(Q_1 - Q_2)(.6)$

$P = 20 - \frac{2}{3}\left(\frac{57}{5}\right) = \frac{300}{15} - \frac{114}{15}$

$P_2 = \frac{186}{15} = 12\frac{6}{15}$

$P_1 - P_2 = 13 - 12\frac{6}{15} \Rightarrow$ very small $\Rightarrow DWL \approx \left(\frac{1}{2}\right)(\text{very small \#})(.6) =$ very small #!!

CONTINUE EXAM! EXAM HAS 30 SCANTRON QUESTIONS AND 2 ESSAY QUESTIONS

Use the following information to answer the **next two (2)** questions.

Consider the market for health care. In this market there are two types of consumers: poor consumers and non-poor consumers. The following equations provides the demand for health care from these two groups where P is the price of a unit of health care services and Q is the number of units of health care services:

Demand for health care services from the poor: $P = 100 - (1/5)Q$
Demand for health care services from the non-poor: $P = 1000 - Q$

You are also told that the supply of health care services is given by the following equation:

Supply of health care services: $P = 10 + (1/30)Q$

SOME WORK

20. Suppose the government has no program to help provide health care services to the poor. Given this information and holding everything else constant, which of the following statements accurately describes the market demand curve for medicine where the market includes both poor and non-poor consumers?

I. The market demand curve is a straight line. No, 2 linear segments
II. The market demand curve is composed of two distinct linear segments. Yes
III. The market demand curve "bows out" from the origin. No, "bows in"
IV. The market demand curve for quantities less than or equal to 900 units is composed only of non-poor consumers. Yes

a. Statements I is a true statement.
b. Statements II and III are true statements.
c. Statement II is a true statement.
d. Statement II and IV are true statements.

SOME WORK

21. Suppose the government has no program to help provide health care services to the poor. Given this information and holding everything else constant, the equilibrium price of health care services will be ____ and the poor will consume (approximately) _____ units of health care services.

a. $100 per unit of health care services; 0 units of health care services
b. $995 per unit of health care services; 0 units of health care services
c. $50 per unit of health care services; 250 units of health care services ✓
d. $90 per unit of health care services; 73 units of health care services

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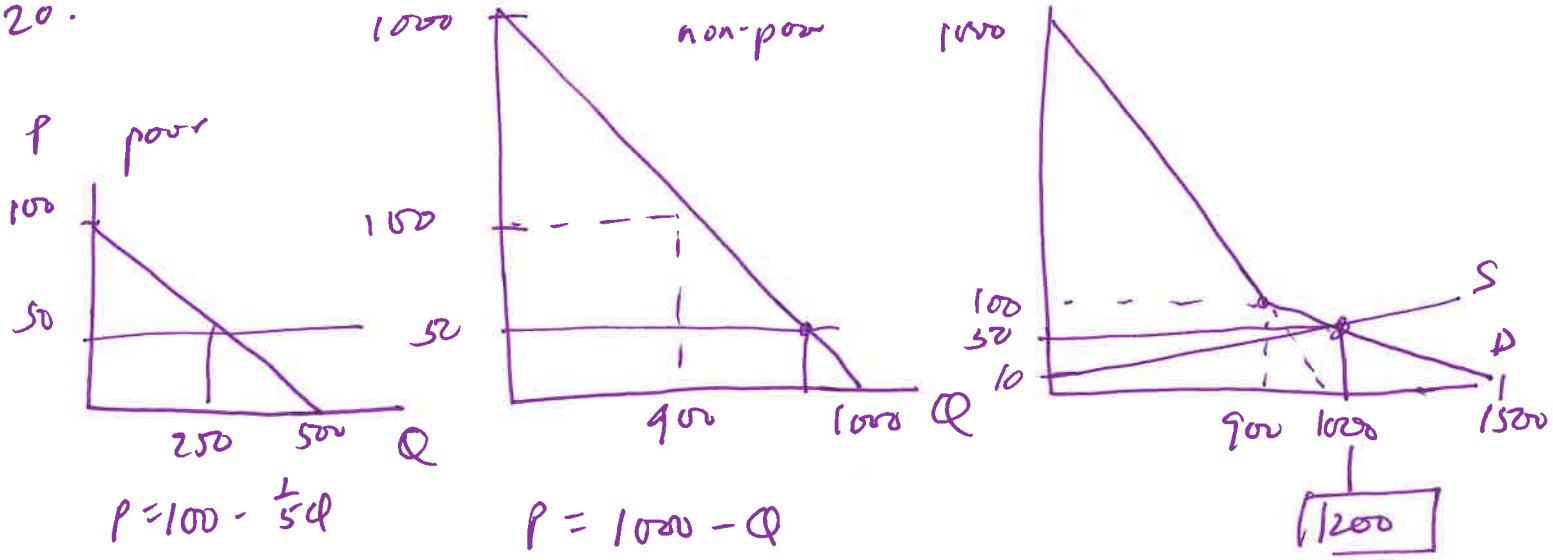
20.



21.

if $Q = 900 \Rightarrow P = 10 + \frac{1}{30}(20\emptyset)$

$P = 10 + 30 = 40$ ⇒ so use lower segment of market D curve

Mkt D : lower segment $\quad P = b - \frac{1}{6}Q$

$0 = b - \frac{1}{6}(1500) = b - 250$

$\therefore b = 250$

D: $\boxed{P = 250 - \frac{1}{6}Q}$

S: $\boxed{P = 10 + \frac{1}{70}Q}$

$250 - \frac{1}{6}Q = 10 + \frac{1}{70}Q$

$240 = \frac{5}{30}Q + \frac{1}{70}Q$

$240 = \frac{1}{5}Q$

$Q = 5(240) = 1200$

$P = 250 - \frac{1}{6}Q = 250 - \frac{1}{6}(1200) = 50$

CONTINUE EXAM! EXAM HAS 30 SCANTRON QUESTIONS AND 2 ESSAY QUESTIONS

EITHER YOU KNOW THIS OR YOU DON'T

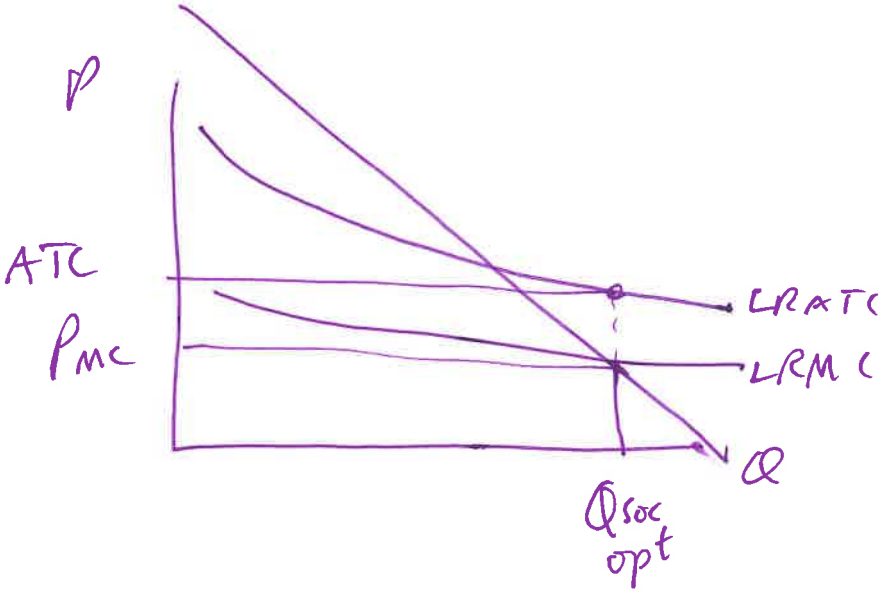
22. There are approximately 210 countries in the world. To make the math easier for this problem, let's simplify and use 200 as the number of countries in the world. According to the **CIA World Factbook** in 2017, the infant mortality rate in the United States relative to all these countries would have placed the United States:

a. In the top 10% of all countries worldwide when ranking countries from the lowest infant mortality rate to the highest infant mortality rate. No, US is #56, top 10% is first 20
b. In the top 20% of all countries worldwide when ranking countries from the lowest infant mortality rate to the highest infant mortality rate. No, US is #56, top 20% is first 40
c. In the bottom 50% of all countries worldwide when ranking countries from the lowest infant mortality rate to the highest infant mortality rate. No bottom 100 countries
d. In the top 30% of all countries worldwide when ranking countries from the lowest infant mortality rate to the highest infant mortality rate. Yes, US is #56, top 30% is first 60

NOT HARD

23. Consider a natural monopoly that is currently regulated to produce the socially optimal amount of the good. Given this information and holding everything else constant, which of the following statements is true?

a. At this level of output the firm's marginal cost of producing the last unit will be a negative number. X
b. At this level of output the firm's marginal cost of producing the last unit exceeds the firm's average cost per unit. X
c. At this level of output the firm's regulated price for the good will be less than the firm's average cost per unit.
d. At this level of output the firm's regulated price for the good will be less than the firm's marginal cost of producing the last unit. X



PRETTY EASY

24.The Affordable Care Act (ACA) had three basic principles. Given these three basic principles, how many of the following statements are true?

I. The ACA provided subsidies to help low-income individuals purchase health insurance: in this sense, the ACA was a program that redistributed income. True
II. The ACA required everyone to buy health insurance in order to ensure that the "insured pool" was not adversely selected. True
III. The ACA required everyone to buy health insurance to make sure that people did not engage in morally hazardous behavior towards the companies providing the health insurance. Fals → to make sure insured pool was not adversely selected
IV. The ACA established the legal right of an individual to get medical insurance regardless of any pre-existing conditions that individual might have. True

a. Statements I, II and IV are true statements about the ACA.
b. Statements I, II, III and IV are all true statements about the ACA.
c. Statements I and II are true statements about the ACA.
d. Statements I and IV are true statements about the ACA.

SOME THOUGHT

25.In this class we have found market demand curves by summing vertically and by summing horizontally. How many of the following statements are true about this topic?

I. When finding the market demand curve for a public good one should hold quantity constant and add together the prices that the individuals in this market are willing to pay for that quantity. True
II. If you want to find the market demand curve for a private good algebraically you need to write the individual demand curves in y-intercept form before you sum together the individual demand curves to get the market demand curve. False ⇒ X-intercept form
III. When finding the market demand curve for a public good the property of being non-rival means that individual demanders will have an incentive to free ride. X Should be non-excludable
IV. In finding the market demand curve for a public good one can simply sum together the individual demand curves for the good provided the demand curves are written in y-intercept form and no one in the market is free riding. True

a. Statements I, II, III and IV are all true statements.
b. Statements I and II are true statements.
c. Statements I, III and IV are true statements.
d. Statements I and IV are true statements.

WORKSHEET: DO NOT REMOVE THIS SHEET FROM THE EXAM

CONTINUE EXAM! EXAM HAS 30 SCANTRON QUESTIONS AND 2 ESSAY QUESTIONS

Use the following information to answer the **next three (3)** questions.

Consider the market for gadgets that can be described by the following equations where P is the price per gadget and Q is the number of gadgets:

Market Demand Curve for Gadgets: P = 200 – 2Q
Market Supply Curve for Gadgets: P = 20 + 3Q

The production of gadgets creates pollution costs of $10 per unit that are currently not included in this market.

SOME WORK

26. Given this information and holding everything else constant, the total externality cost when this market does not internalize the full costs of producing gadgets is equal to:

a. $10 per gadget that is produced
b. $360
c. $36
d. $340

SOME WORK

27. Given this information and holding everything else constant, the deadweight loss from this externality not being internalized by the market is equal to:

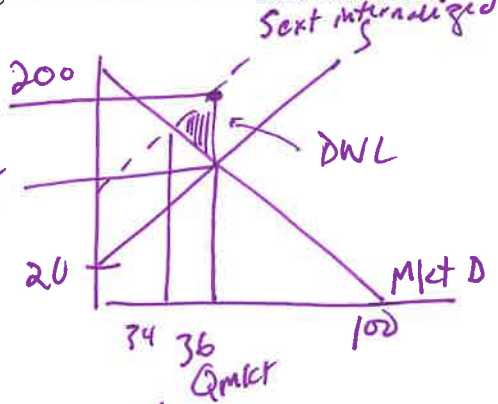
a. ($10 per unit)(1 unit)
b. (1/2)($138 per unit - $128 per unit)(34 units)
c. (1/2)($10 per unit)(36 units)
d. ($138 per unit - $128 per unit)(36 units – 34 units)

NOT HARD

28. Given this information and holding everything else constant, if the government implemented an excise tax to completely correct for this externality, how much tax revenue would the government receive from this excise tax?

a. $36 per unit
b. $10 per unit
c. $340
d. $360

Tax Rev = (tax/unit)(# units w/ tax)
($10/unit)(34 units)



26. $200 - 2Q = 20 + 3Q$
$180 = 5Q$
$36 = Q_{mkt}$
Total Ext cost of Q_{mkt} = ($10/unit)(36 units) = $360

27. $S_{ext\ internalized}$: $P = 30 + 3Q$
$200 - 2Q = 30 + 3Q$
$170 = 5Q$
$34 = Q$
$DWL = \frac{1}{2}(10)(36 - 34)$

if $Q = 36 \Rightarrow P$ on $S_{ext\ internalized}$
$P = 30 + 3(36)$
$P = 30 + 108 = 138$

if $Q = 36 \Rightarrow P = 200 - 2Q$
$P = 200 - 72$
$P = 128$

NOT BAD.

29. Use the following information to answer the **next two (2)** questions.

Consider a firm that has decided to hire workers at two different wage rates: they plan to pay a gross wage of $15 per hour for workers who have six years of schooling beyond the compulsory level of schooling and they plan to pay a gross wage of $10 per hour for workers who do not have this level of schooling (that is, they have less education). The firm distinguishes three broad categories of potential workers: high-quality workers, mid-quality workers, and low-quality workers. The cost of attaining the educational credential differs for each category of worker and is given by the following equations where C is the cost they give up per hour and Q is the number of years of schooling:

Cost of educational credential for high-quality worker: C = .2Q

Cost of educational credential for mid-quality worker: C = .4Q

Cost of educational credential for low-quality worker: C = Q

29. Given this information and holding everything else constant, if the low-quality worker gets the educational credential then their net wage (net of costs) will equal _____ and if the mid-quality worker gets the educational credential then their net wage will equal _____.

a. $21 per hour; $17.60 per hour
b. $9 per hour; $12.60 per hour
c. $4 per hour; $7.60 per hour
d. $15 per hour; $15 per hour

low-quality
$W = W^* - C_{low}$
$W = 15 - 6 = \$9/\text{hour}$

mid-quality
$W = W^* - C_{mid}$
$W = 15 - .4(6) = 15 - 2.4 = \$12.60/\text{hour}$

30. Given this information and holding everything else constant, which of the following statements is true?

a. The net wages for the high-quality and the mid-quality workers will end up converging to the same amount. No
b. Only the high-quality workers will decide that getting the educational credential is worth it. No
c. The low-quality worker will decide that it is not worth getting the educational credential. Yes
d. Both the low-quality and mid-quality workers will decide that getting the educational credential is worth it. No

CONTINUE EXAM! EXAM HAS 30 SCANTRON QUESTIONS AND 2 ESSAY QUESTIONS

Essays: 2 questions worth 10 points each

1. Provide a clear essay with strong examples to illustrate the similarities between a city bus system and a natural monopoly.

Grading Rubric:

Explanation for why a city bus system might be considered a natural monopoly: 4 points
Inclusion of specific examples to support this argument: 4 points
Overall quality: 2 points

2. George Akerlof worried that used car markets would attract primarily low-quality cars. Provide an explanation of his basic argument and then two other examples where this argument might also arise.

Grading Rubric:

Explanation of Akerlof's argument: 4 points
Two examples of his basic argument: 4 points
Overall clarity, organization and expression in the essay: 2 points