

## Midterm Exam 2

Version 1-Yellow

Instructions: Answer each of the questions. Print your name and student number clearly on the answer sheet. Fill in the bubbles corresponding to your student number, leaving the top two boxes blank (or inserting a dash there) and filling in the "0" bubble in the top two rows.

1. My version of the quiz is
  - a. Version 1 – Yellow
  - b. Version 2 – Purple
  - c. Version 3 – Green
  - d. Version 4—Pink
  - e. Version 5—White
  
2. You applied and have been accepted to a graduate program. Since you have taken Economics this semester, how would you decide whether or not to attend the program?
  - a. Compare the total costs of your undergraduate degree to the total benefits of all of the school you have attended. If this is greater than zero, you should attend.
  - b. Compute the net present value of obtaining a masters degree when compared to just finishing your bachelors degree. If the net present value is positive, the future benefits outweigh the costs and you should attend.
  - c. If the future value of the benefits is greater than the present value of the costs of attending the graduate program, then you should not attend the program.
  - d. If the present value of the costs of attending outweighs the future value of the benefits of attending the program, then you should attend the graduate program.
  
3. The signaling model differs from the human capital model of educational attainment in that
  - a. You calculate the net present value to decide if you want to attain Human Capital, though you do not do this same calculation for the signaling model.
  - b. In the signaling model, additional years of schooling do not make individuals more productive.
  - c. The human capital model says that additional years of schooling do not make individuals more productive.
  - d. The two models are synonymous.
  
4. If I want to compare \$X today to \$Y tomorrow, I could do which of the following?
  - a. Calculate the present value of \$Y and compare it with \$X
  - b. Calculate the future value of \$X and compare this with \$Y
  - c. Calculate the future value of \$Y and compare it with \$X
  - d. a and b are both correct.

5. \$200 today is worth how much in 10 years? Assume the interest rate is 2%.

a.  $200(1.02)^{10}$

b.  $\frac{200}{(1.02)^{10}}$

c.  $200(3)^{10}$

d.  $\frac{200}{1.02}$

6. John is a landlord, and the residents he leases to offers him two options. They plan to move in for the next year. They can give him \$12,000 today or wait 1 year, and give John \$13,000 instead. You advise John to take the \$12,000 today if:

a.  $12,000(1 + r) \geq 13,000$

b.  $\frac{12,000}{(1+r)} \geq 13,000$

c.  $12,000 \geq 13,000(1 + r)$

d.  $12,000(1+r) \geq 13,000$

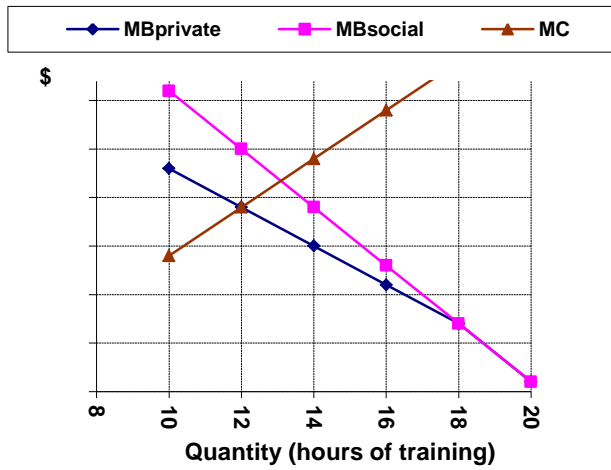
7. You live next door to a bakery, where the smells of baked goods produced provide a positive externality as you wake up each morning. Your neighbors agree that the bakery is a positive externality, but it only stays open until 2:00 each day. This is a classic example of market failure since:

a. there is under-provision of baked goods in the private equilibrium when compared to the social equilibrium.

b. an efficient outcome, since the bakery is a private business.

c. there is over-provision of baked goods in the private equilibrium when compared to the social equilibrium.

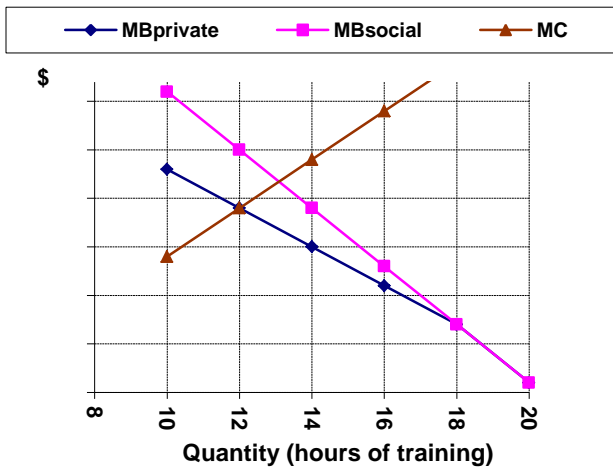
d. the bakery is a monopoly.



8.

The above graph displays the market for an English language training program in the U.S. for foreign born citizens. MC represents the marginal cost of the training program.  $MB_{private}$  is the private marginal benefits of the training program, and  $MB_{social}$  is the social demand curve and represents the social marginal benefits of the training program. Given the situation depicted the in graph, the private optimum quantity is \_\_\_\_\_ hours of training, and the social optimum quantity is \_\_\_\_\_ hours of training?

- a. 12; 13.
- b. 13; 12.
- c. 12; 12.
- d. 13; 13.



9.

The above graph displays the market for an English language training program in the U.S. for foreign born citizens. MC represents the marginal cost of the training program.  $MB_{private}$  is the private marginal benefits of the training program, and  $MB_{social}$  is the social demand curve and represents the social marginal benefits of the training program. Which of the following could produce a situation where the  $MB_{social}$  and the  $MB_{private}$  differ in the way depicted in the graph?

- a. The training program produces pollution that generates a negative externality.
- b. The training program benefits society, since foreign born citizens are more efficient and productive than they were prior to the training, and hence, generates a positive externality.
- c. The training program is heavily taxed.
- d. None of the above options are possibilities.

10. In order to produce the socially optimal level of a good when there is a positive externality, the government should:
- subsidize the good.
  - tax the good.
  - not interfere.
  - put a price floor on the good.

11. A CNN reporter claims that there are too few college graduates in the U.S. You correctly respond that this is because:
- the opportunity costs of going to college are high.
  - taxes are levied on all individuals.
  - education provides positive externalities to society, making it under-produced.
  - college campuses provide negative externalities, making them under-produced.

**Use the following information for the following four questions:** Suppose that two firms own factories on the coast of a large lake in a rural area. The first firm, Firm 1 makes leather work gloves and the second firm, Firm 2, makes leather wallets. Both firms use a chemical to assist in tanning the leather. Once used, the chemical is poured into the lake by both firms. Previous studies have shown that the used chemical is harmless to fish in the lake in small quantities. A new study, however, has revealed that large quantities – those above 10,000 gallons per year – will begin to harm wildlife. The local government has thus decided to cap the total amount that the two factories can dump into the river at 10,000 gallons per year. This will be problematic for the firms as Firm 1 currently dumps 15,000 gallons per year into the lake and Firm 2 currently dumps 25,000 gallons per year into the lake. Finally, note that, if Firm 2 has to reduce the amount of the chemical that it dumps into the lake, it will use 1 gallon of a chemical that costs \$1/gallon more and can be harmlessly dumped into the lake for each fewer gallon of the old tanner. Due to the need for long-lasting leather, Firm 1, on the other hand, would have to stick with the old tanner and pay \$3/gallon to have it disposed of safely.

12. Suppose the government allows each firm to dump 5,000 gallons of the chemical in the lake. If the firms cannot buy or sell these allowances to or from each other, how much will eliminating the negative externality cost society?
- \$10,000
  - \$20,000
  - \$50,000
  - \$100,000

13. If the firms can buy or sell these allowances to or from each other, how much of the chemical will Firm 1 dump into the lake?
- 10,000
  - 15,000
  - 5,000
  - 0

14. If the firms can buy or sell these allowances to or from each other, what is the minimum price the ability to dump 1 gallon of the chemical into the lake will cost?

- a. \$1
- b. \$0
- c. \$2
- d. \$3

15. If the firms can buy or sell these allowances to or from each other, how much will eliminating the negative externality cost society?

- a. \$50,000
- b. \$30,000
- c. \$100,000
- d. \$40,000

16. Which of the following is **NOT** an example of a public good?

- a. Fire Department protection
- b. Tornado sirens
- c. Highway System
- d. An airplane ticket

17. Which of the following is a reason that education needs to be publicly provided?

- a. The human capital model says that additional years of schooling do not make individuals more productive.
- b. The signaling model says that school does not make individuals more productive.
- c. Education provides positive externalities for society that would be under-produced in the absence of government intervention.
- d. Both b and c are correct.

18. The marginal social cost of providing good X and the marginal private cost of providing good X are identical. The marginal social benefit of consuming good X and the marginal private benefit of good X are identical. This means:
- There is a positive externality in the market for good X.
  - There is a negative externality in the market for good X.
  - There are no externalities present in the market for good X.
  - There is not enough information available to tell if there is or is not an externality in the market for good X.

19.

	<i>SO<sub>2</sub> Emissions: Tons/Day</i>	<i>Marginal Cost of SO<sub>2</sub> Reduction (per ton)</i>
Smokestack 1	350	\$200
Smokestack 2	450	\$300
Smokestack 3	200	\$500

Suppose Leroy owns three smokestacks (shown in the table above), and the EPA imposes a regulation requiring him to cut his emissions in half. He comes to you for advice, and you tell him the most cost-effective way to cut down his emissions. How much will this cost him? Hint: Assume that it is feasible to reduce emissions to 0 at any given smokestack.

- \$115,000
- \$190,000
- \$145,000
- \$135,000

20.

	<i>SO2 Emissions: Tons/Day</i>	<i>Marginal Cost of SO2 Reduction (per ton)</i>
Firm 1	400	\$200
Firm 2	400	\$400
Firm 3	400	\$500

Assume there are 3 Firms in the electricity business and the EPA imposes a regulation to reduce industry-level emissions by a half (see Table above). If they are to do this in the most cost effective way possible (as an industry), this would cost \_\_\_\_\_. However, if each firm were instead to reduce emissions by 50%, this would cost \_\_\_\_\_.

- a. \$160,000; \$220,000
- b. \$160,000; \$160,000
- c. \$220,000; \$160,000
- d. \$80,000; \$220,000

21.

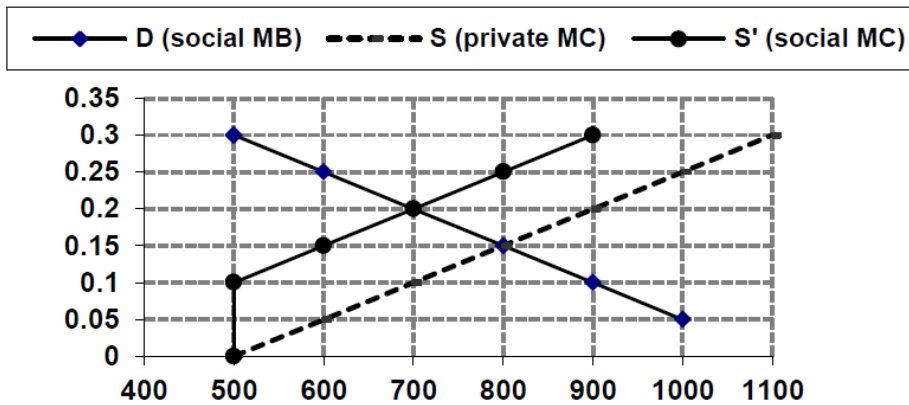
	<i>SO2 Emissions: Tons/Day</i>	<i>Marginal Cost of SO2 Reduction (per ton)</i>
Firm 1	400	\$200
Firm 2	400	\$400
Firm 3	400	\$500

Assume there are 3 Firms in the electricity business and the EPA imposes a regulation to reduce industry-level emissions by a half (see Table above). If each firm were given a tradable permit for 200 tons/day of SO2 emissions, firm \_\_\_\_ would be most likely to buy Firm \_\_\_\_'s permit for at least \_\_\_\_\_.

- a. 3; 1; \$200.
- b. 1; 3; \$200.
- c. 3;1; \$500.
- d. 1; 3; \$500.



22. The Coase Theorem suggests that
- there can never be an efficient outcome in the presence of an externality.
  - there is naturally an efficient outcome in the presence of an externality.
  - assigning property rights is one way to generate an efficient outcome in the presence of an externality.
  - externalities always result in outcomes that are not equitable.



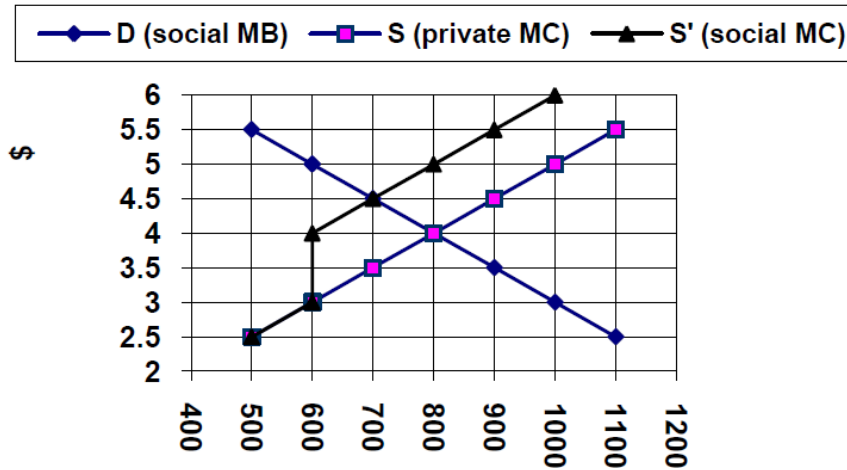
23.

The graph above displays the market for daily UPS packages in Bozeman. These trucks create a large amount of pollution, and the graph shows that the social optimum quantity is \_\_\_\_\_ than the private optimum quantity.

- greater than.
- less than.
- equal to.
- unrelated to.

24. When the social marginal cost of a good exceeds the private marginal cost of that good

- there is a negative externality.
- the good will be over-provided without government intervention.
- the good should be subsidized.
- both a and b are correct.



25.

The graph above shows the market for high end bicycles in Bozeman, where dollars are in hundreds. The production process causes a great deal of pollution, and hence, the private and social marginal cost curves differ. The social optimum in this graph occurs at \_\_\_\_\_ and at a price of \_\_\_\_\_.

- a. 700; \$450
- b. 800; \$400
- c. 600; \$400
- d. 700; \$350

26.

Cocaine Use (per gram)	Private Marginal Costs (MC <sub>private</sub> )	Social Marginal Costs (MC <sub>social</sub> )	Marginal Benefits (MB)
0	1000	1050	5000
10	2000	2050	4000
20	3000	3050	3000
30	4000	4050	2000
40	5000	5050	1000
50	6000	6050	0

The above table depicts the market for cocaine, an illegal substance. The second column shows the Private Marginal Costs, followed by the Social Marginal Costs associated with the drug production and consumption. The final column depicts the Marginal Benefits, or the demand curve for cocaine. Given the information above, what is the per gram amount of the externality (the external costs to society from the drug production and consumption)?

- a. \$3,000
- b. \$50
- c. \$1,000
- d. \$100

27. When the absolute value of the percentage change in quantity demanded is equal to the absolute value of the percentage change in price, this means the good is:

- a. perfectly elastic.
- b. perfectly inelastic.
- c. inferior.
- d. unit elastic.

28. Rachael's coffee shop maximizes its total revenue by selling cappuccinos at \$3.00/cup. At this price, you predict that.

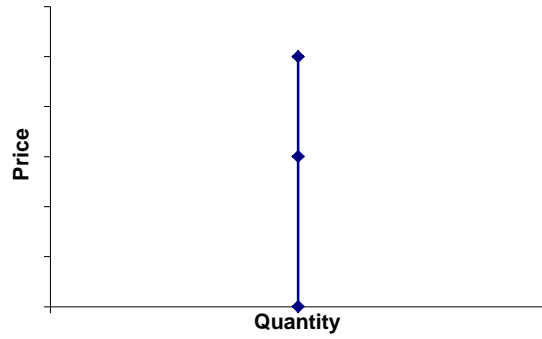
- a. the demand for cappuccinos is elastic.
- b. the demand for cappuccinos is inelastic.
- c. the demand for cappuccinos is unit elastic.
- d. there is excess demand for cappuccinos.

29. An increase in the supply of a good results in no change in the equilibrium quantity demanded of the good traded when:

- a. demand is perfectly inelastic.
- b. demand is perfectly elastic.
- c. demand is unit elastic.
- d. the elasticity of demand is 1.

30. Bill Gates tells you that the elasticity of demand for Microsoft Office is -2. You notice that this month, the price of MS Office has increased by 10%, you accurately predict that the quantity of MS Office software will:

- a. fall by 20%
- b. rise by 20 %
- c. fall by 5 %
- d. rise by 5%



31.

The above depicts a demand curve that is:

- a. unit elastic.
- b. perfectly inelastic.
- c. perfectly elastic.
- d. relatively elastic.

32. When demand is elastic, a rise in the price of a good

- a. increases total revenue.
- b. decreases total revenue.
- c. does not change total revenue.
- d. always results in negative revenue.



33.

In the above graph, moving from point B to point A will \_\_\_\_\_ total revenue by \_\_\_\_\_.

- a. decrease; 24
- b. decrease; 4
- c. increase; 42
- d. increase; 24

34. Which of the following would goods would have the most elastic demand?

- a. a prescription drug with no substitutes.
- b. a luxury good, like a high end sports car
- c. a small purchase, like gum.
- d. a good that you require today, like oil, but has just had a sharp price increase.

## ANSWER KEY

1 a

2 b

3 b

4 d

5 a

6 a or d

7 a

8 A

9 b

10 a

11 c

12 c

13 a

14 a

15 d

16 d

17 c

18 c

19 a

20 a

21 a

22 C

23 b

24 d

25 a

26 b

27 D

28 C

29 a

30 a

31 b

32 b

33 a

34 B