

**Read these instructions carefully**

This exam has 50 questions and 13 pages. Make sure you have 50 questions.

The exam has two questions in it about the structure of the course. For each of these questions you answer, you will be marked correct, no matter how you answer. This gives you 2 correct answers out of 50 for free.

When answering a true/false question ignore the words “true” and “false” on the bubble sheets. That is, sometimes “true” will be bubble A and sometimes “true” will be bubble B.

Make sure you mark your bubble sheet Version 1

Note that many of the questions on this exam are variations on the questions you have seen on the Sapling quizzes or on the old exams. So, if a question looks familiar it might not be identical to a previous question. Read the questions carefully.

1. Ali's marginal rate of substitution of candy for time disco dancing (for Ali, both goods) is, in absolute value, his WTP for another unit of dancing, expressed in terms of forgone candy.  
A) Incorrect  
B) Correct

Ali's MRS<sub>cd</sub> is, in absolute value his WTP for another unit of candy, expressed in terms of forgone dancing time

2. If there are no fixed costs, then the firm's average cost curve and its average variable cost curve are the same curves.  
A) No  
B) Yes
3. (Ali) Consider a world with two goods: hummus and falafel. Ali loves falafel, the more the better, but is indifferent to the amount of hummus he eats. If the quantity of hummus is placed on the horizontal axis and the quantity of falafels he eats is placed on the vertical axis, which statement best describes the shape of Ali's indifference curve?  
A) horizontal straight line  
B) upward sloping  
C) vertical straight lines  
D) downward sloping

4. The \_\_\_\_ function in producer theory is analogous to the \_\_\_\_ function in consumer theory-- \_\_\_\_\_. (Choose the answer that is both correct and most informative).
- A) production; utility; that is, both measure output: one in units of product produced, the other in utils produced.
  - B) production: utility; except output levels have cardinal meaning whereas utility numbers only represent an ordering of bundles

Both answers are correct, but B is more informative. That is, output levels have cardinal meaning (e.g. 9 units of output is 4 more units than 5 units, and 9 units of output is three times as much as 3 units of output).

But if one bundle produces 10 utils and another 2, all one can say is the first bundle is preferred to the second. The difference (8) means nothing.

5. The prefix "iso" means equal?
- A) Incorrect
  - B) Correct
6. The isocost line in producer theory is analogous to which of the following from consumer theory?
- A) An isoquant
  - B) A budget line
  - C) An indifference curve
  - D) None of the above
7. Marginal cost is the change in:
- A) total cost resulting from a one-unit change in output.
  - B) total cost resulting from a one-unit change in a variable input.
8. Picture the indifference curve for carrots, a good, and candy, initially more is preferred to less but eventually it become a bad. If quantity of candy is on the vertical axis and the quantity of carrots is on the horizontal axis which statement best describes the shape of the indifference curve?
- A) U-shaped
  - B) inverted U-shaped
  - C) C-shaped
  - D) backward C-shaped
  - E) None of the above

There were lots of question on old exams about the shapes of indifference curves, and we spent a bunch of time on the issue Monday night in the review session.

So, what do we know: carrots are a good (more is always preferred to less) but for candy, first more is preferred to less but at some point, things flip, and more is worse than less.

Carrots on the horizontal axis, candy on the vertical

Draw the graph (identify an amount of candy where it goes bad, a vertical point)

It is C shaped: downward sloping where more candy is preferred to less, then upward sloping where less candy is preferred to more.

What would it look like if candy was on the horizontal axis?

9. The marginal cost of Fred producing ski miles depends on only her production function for producing ski miles.
  - A) Correct
  - B) Incorrect because it also depends on the opportunity cost of her time and the prices of the other variable inputs.
  - C) Incorrect because it also depends on the opportunity cost of her time.
  
10. Consider, as presented in class, Fred's production of snerd edibles. Assume Fred's shortrun production function of producing edibles is  $e=e(L)= 10(L)^{-3}$ , where L is labor. Which of the following is both correct and most informative?
  - A) The marginal product of labor start positive be eventually becomes negative.
  - B) The marginal product of labor is always declining.
  - C) The marginal product of labor is both always positive and always declining.
  
11. (Joel) Suppose we have the following cost function for snerd edibles:  $c(e,w) = we^2$  where e is the number of edibles produced and w is the wage rate. If the wage is currently set at  $w= \$3$ , what is the marginal cost of producing the 3rd unit?
  - A) 3
  - B) 27
  - C) 12
  - D) 15

12. Consider my dog, Giacomo. He cares about only two things: playing and eating. He always prefers an additional kilo of meat to an additional kilo of cheese. He always prefers additional playing tug to additional playing fetch. In fact, he does not like to play fetch. Bundles for Giacomo consist of different amounts of meat, cheese, tug time, and fetch time. If two bundles have the same amount of cheese, he will, for sure, rank lower, the one with less meat.
- A) Giacomo will always rank a bundle with less meat lower than all bundles with more meat.
  - B) This last statement follows from what was assumed.
  - C) He might rank lower the one with less meat, but this does not follow from what was assumed.
  - D) This question is stupid: Giacomo is just a dog, so can't rank bundles.
13. I have taken at least one calculus course. (If you answer this question it will be marked correct.)
- A) not sure
  - B) Yes
  - C) No
14. Assume a world of only two goods: hamburgers and hot dogs. At Mabel's current consumption levels, the maximum number of hot dogs she would be willing to give up in order to obtain one more hamburger is her
- A) Marginal rate of substitution of hot dogs for hamburgers
  - B) Marginal rate of substitution of hamburgers for hot dogs
15. (Joel) Suppose we spend some more time observing Wilbur and discover he lives in the mountains of Colorado and snowfall affects his demand for gasoline in the following way:
- $$Q = 8 + .2Y - .75P^2 + .5S$$
- Where S stands for annual snowfall in feet, Y is his income (in thousands) and P is the price of gasoline. Based on Wilbur's demand function, Wilbur probably does not like snow sports (skiing, boarding, etc.)
- A) Incorrect
  - B) Correct

(Ali) If the own-price elasticity of demand is -1.5 and a price increase caused demand to increase by 1.8%, approximately how much did the price increase in % terms?

- A) 0.83%
- B) 2.70%
- C) 0.67%
- D) 1.20%

The elasticity in question is  $(\% \text{ change in demand})/(\% \text{ change in price}) = -1.5$

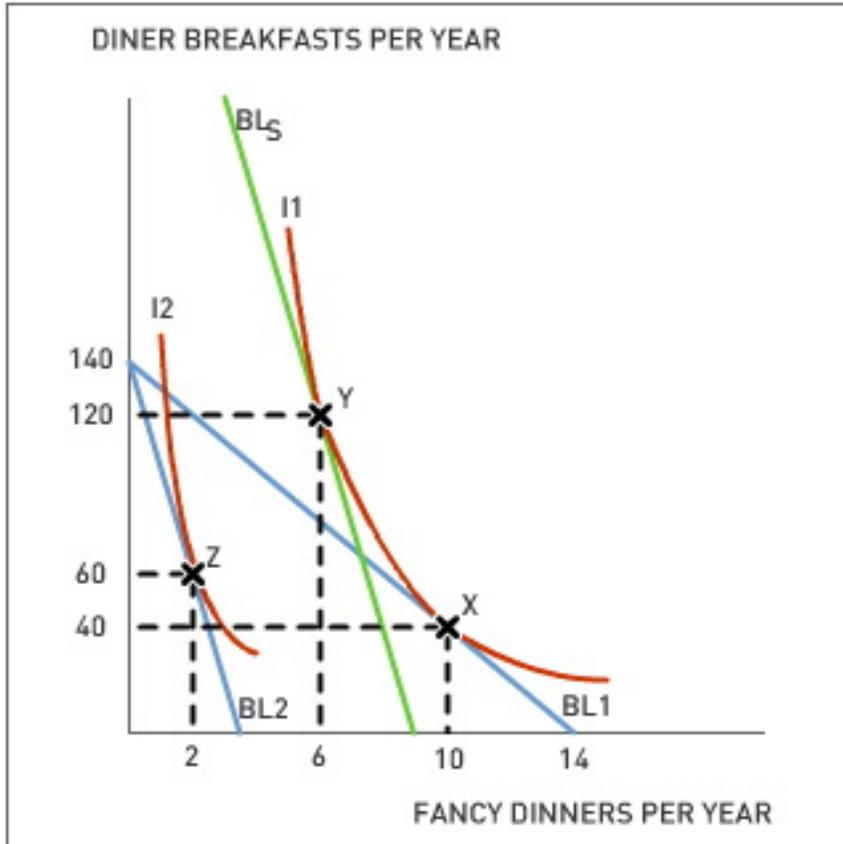
So, we know that  $(-1.8)/x = -1.5$

Solve this to get  $x=1.2$

17. Consider Fred the skier who is producing ski miles using two variable inputs: her time and cans of Red Bull (a drink packed with caffeine). Might, at some levels of use, the MP of Red Bull be negative?

- A) Unlikely
- B) Definitely

18. Paolo and Maria Rossi live in San Diego and enjoy going out to fancy restaurants for dinner and to diners for breakfast. On the following diagram, the curves I1 and I2 represent two of their indifference curves for fancy dinners versus diner breakfasts. Their total income to be spent on eating out is \$1,400 per year. The price of a diner breakfast is always \$10. BL1 is the budget line when dinners cost \$100, and BL2 is the budget line when dinners cost \$400. The lines BL2 and BLS are parallel, and BLS is tangent to I1 at point Y.



The substitution effect of the price increase, from \$100 to \$400 for each fancy dinner, causes them to go out to diners, for breakfast \_\_\_\_\_ times per year.

- A) 12 fewer
- B) 4 fewer
- C) 80 fewer
- D) 80 more

120 minus 40=80. Originally at bundle x, then the price of dinners increases making dinners more expensive and breakfast relatively less expensive. His new best bundle is bundle z. But, If we hold him to the original indifference curve he would choose bundle y which has 80 more breakfasts and 4 fewer dinners. The income effect is y to z.

19. You often read in micro-economics textbooks that shortrun profits are maximized at a level of output where price equals the marginal cost of production. Consider this assertion in the context of a firm that can sell as much, or as little, as it wants at some exogenous price, and where marginal cost is the same constant at every level of output (e.g. \$5). In this situation, the firm's profits will **necessarily** be maximized at a level of output where price equals the marginal cost of production? (Choose the answer that is both correct and most informative.)
- A) No  
 B) No--because there might not be a level of output where price equals marginal cost.  
 C) Yes--because there is always a level of output where price equals marginal cost.  
 D) Yes
20. Imagine a world of two commodities: pollution (a bad) and a good. Betty and Bob have the same preferences, face the same prices, and each has the same amount of income. Neither faces any other constraints. Their WTP to reduce pollution by one unit (in terms of forgone goods) is
- A) not necessarily the same.  
 B) necessarily the same.
21. (Joel) Suppose we have estimated Wilbur's Demand function for gallons of gasoline as a function of his annual income and the price of a gallon of gasoline:
- $$Q = 8 + .2Y - .75P^2$$
- Where Q is quantity demanded of gallons of gasoline. Y is Wilbur's annual income in thousands of dollars. P is the price of a gallon of gasoline. If the price of gasoline is currently \$2 a gallon and Wilbur's income increases from 50 (thousand) to 60 thousand dollars per year what is his Income Elasticity of Demand?
- A) 2/11  
 B) 23/11  
 C) 11/23  
 D) - 2/11

So, none of these answers are correct

If gas is \$2/gallon and income 50K,  $Q=8+.2(50)-.75(2)^2=15$   
 If gas is \$2/gallon and income is 60K his Q increase by 2 to 17  
 The percentage change in income is  $(60-50)/55=10/55=2/11$   
 The percent change in Q is  $2/16=1/8$   
 So  $(1/8)/(2/11)=11/16$

22. (variation on Zach question) After spending his **second hour** with Mickey, Donald's insanity increased by 20%. Which of the following statements is both correct and most?
- A) In this range, the time-with-Mickey elasticity of Donald's insanity is positive and elastic
  - B) In this range, the Donald's-insanity elasticity of time-with-Mickey is positive and elastic.
  - C) **In this range, the time-with-Mickey elasticity of Donald's insanity is positive but inelastic**
  - D) In this range, the Donald's-insanity elasticity of time-with-Mickey is positive but inelastic

**The time with M elasticity of D's insanity is  
 (% change in D's insanity)/% change time with M  
 How much D's insanity increases in % terms) when he spends 1% more time with M.**

**The D's insanity elasticity of time with M is  
 (% change in time with M)/(% change D's insanity.  
 How much more time D spends with M (in% terms) if his insanity increases by 1%**

**When Donald goes from 1 to 2 hours with Mickey, his time with mickey increases approx. 100% (it doubles) but his insanity only increased by 20%, so the answer is C.**

23. Larry the Liberal hates The Donald, and ranks **every** bundle with Donald as President lower than every bundle where Donald is not President. Given this, evaluate the following statement. "Larry would rather his kids starve than have Donald as President." (Choose the answer that is both correct and most informative.)
- A) The quoted statement does not logically follow from what is assumed.
  - B) There is no enough information to determine whether the quoted statement logically follows from what is assumed.
  - C) The quoted statement logically follows from what is assumed.
24. (variation on old question) All I care about is publishing research papers and going skiing; I like doing both--the more the better. CU pays me \$105 a week (my income). Skiing costs \$20 a trip, and journals charge \$15 for each paper they publish- they always accept my papers. It takes me 6 hours to do a ski trip and 4 hours to write a paper. I have 40 hours a week to allocate to writing and skiing, and I can spend only spend my \$105 on these two activities. Which of the following statements is both correct and most informative?
- A) I might ski 3 times and write 2 papers.
  - B) I might ski 3 times and write 3 papers.
  - C) I might ski 7 times

25. According to consumer theory, every possible bundle is on one of your indifference curves (in one of your indifference sets)
- A) Incorrect
  - B) Correct
26. If I donate \$100 to the Trump re-election campaign, this indicates that my  $MRS_{TG}$  is **at least** \$100, where T is a second term for Donald, and G is market goods.
- A) Incorrect
  - B) Correct
27. Horton the elephant **LOVES** peanuts (more are always preferred to less) and he **HATES** mice (fewer are always preferred to more). Horton lives in a world of two items, mice and peanuts. Given his preferences, rank the following baskets.
- Basket I= 100 peanuts and 20 mice  
 Basket II= 50 peanuts and 20 mice  
 Basket III= 100 peanuts and 10 mice  
 Basket IV=75 peanuts and 20 mice
- (The notation " $X>Y$ " is read "X is preferred to Y", and the notation " $X=Y$ " is read "the individual is indifferent between X and Y".)
- A)  $II>I>IV>III$
  - B)  $III>IV>II=I$
  - C)  $IV>III=II=I$
  - D)  $III>I>IV>II$
28. Assume there are only two commodities in this world: books by Marcel Proust (a famous French author) and books by the British Author E.L. James (One of his books is "Fifty Shades of Grey"). Given your tastes, books by James are perfect substitutes for books by Proust, and both are goods. Let  $P_P$  be the price of a book by Proust, and  $P_J$  be the price of a book by James. Your money income is M, and you face no other constraints. Which is more likely?
- A) You buy books by both authors.
  - B) You buy books by only one of the authors.

29. Consider, as presented in class, Fred's production of snerd edibles. Remember that Fred is a competitive firm. It is the shortrun and there is only one variable input, hours of Lucas's time. To maximize her profits, Fred should increase Lucas's hours worked if
- A) Neither of the other answers are correct.
  - B) The value of what Lucas produces if he works another hour is greater than his hourly wage rate.
  - C) The value of what Lucas produces if he works another hour is great than the price of edibles.

30. Wilma's utility function for the two goods x and y is  $U=x^2y^5$ . (Notice the size of the exponents) Given these preference, Wilma is likely to consume more x than y? (Choose the answer that is both correct and most informative.)
- A) Without more information it is impossible to tell.
  - B) Yes
  - C) No

It could go either way. It also depends on the relative prices of x and y. What if x was way more expensive than y?

31. Which statement best describes how the competitive firm chooses the input combination it will use to produce, in the long run, its chosen level of output.
- A) It is determined by the price it can sell its output.
  - B) It is determined by the isoquant map
  - C) It is determined by the state of technical knowledge for producing its output, and the input prices it faces
  - D) It is determined by the input prices

32. Consider, as presented in class, Fred's production of snerd edibles. Remember that Fred is a competitive firm. It is the shortrun and there are two variable inputs (hours of Lucas's time, and cans of Red Bull). Fill in the blanks.

The marginal product of \_\_\_\_\_ in the production of \_\_\_\_\_ is how much \_\_\_\_\_ when \_\_\_\_\_ increases by one unit, holding constant \_\_\_\_\_

- A) Both of the other answers are correct.
  - B) Red Bull; snerd edibles; output; increases; Red Bull; the number of hours Lucas works.
  - C) labor; snerd edibles; output; increases; labor, Red Bull
33. In a world of only two commodities, both goods, indifference curves always slope down.
- A) This statement is not correct.
  - B) This statement is correct.

34. There are two commodities in the world, pancakes (p) and sausage links (s). Joe's Utility function is  $U(p,s) = 2p + 3s$ . How many pancakes must Joe give up if he is to gain one more sausage while staying on the same indifference curve?
- A)  $3/2$
  - B) 2
  - C) 3
  - D)  $2/3$
35. Wilbur's ranking of bundles is simply a convenient way to keep track of how much utility Wilbur gets from each bundle.
- A) Incorrect

B) Correct

This is backwards (incorrect): Wilbur has a ranking of bundles and his utility function is simply a way to keep track of how he ranks bundles.

Economists don't really believe you have utility somewhere in your head. You have a ranking of bundles.

36. Imagine that a firm's maximum output depends on three things: the amount of labor it uses, the amount of capital it uses, and the amount of air pollution in the neighborhood. It is the shortrun and the firm is constrained to use a fixed amount of capital. All else constant, the more air pollution, the less output the firm produces. The firm's isoquants (pollution on the vertical axis, labor on the horizontal axis: (Choose the answer that is both correct and most informative.)
- A) They most likely slope up.
  - B) They must slope down
  - C) They must slope up
  - D) They most likely slope down

There are three factors that determine how much a firm produces: two inputs (l and k) and pollution (which is a bad)

It is the SR, so the amount of k is fixed. So, there are only two factors that vary: l and p.

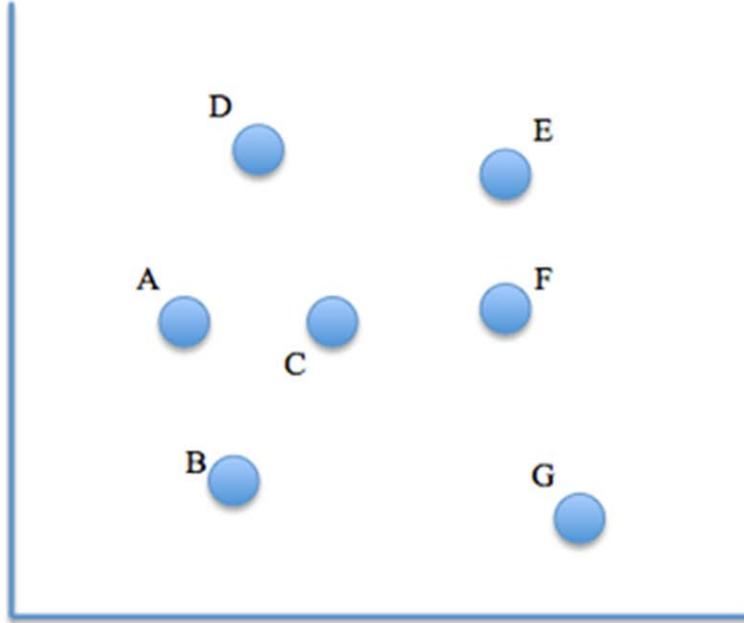
Draw the isoquant, pollution on the vertical axis.

One factor is a bad, one a good, so, if pollution increases, to hold output constant (remain on the same isoquant) l must increase.

That is, they must slope up.

The presence of alternative A made this a difficult question.

37. (Owen) Assume a world of two commodities: a bad and a good. On the graph below the bad is on the vertical axis and the good is on the horizontal axis. Each dot represents a different consumption bundles. (To be clear bundles A and C have the same amount of the bad, and bundle F has a bit more of the bad). Which bundle(s) are necessarily preferred to bundle C?



- A) bundles D, E and F  
B) bundle B  
C) bundles E, F and G  
D) bundle G
38. The concept in consumer theory that is analogous to the marginal product of an input in production theory is the marginal utility of a good in consumption.  
A) Correct  
B) Incorrect
39. A competitive firm produces bad wine. Evaluate the following statement: Its production function and its cost function contain different pieces of information about the technology for producing bad wine.  
A) Incorrect.  
B) Correct.

40. ) (Joel) Suppose Hobo Hank spends his money on two goods; cigarettes and alcohol, and he is currently consuming some of both. His indifference curves are downward sloping getting less steep as the amount of cigarettes increases (cigarettes on the horizontal axis, alcohol on the vertical). Then, a tax is imposed on cigarettes that increases their price. After the tax is implemented, Hobo Hank is worse off, and expresses his concerns on a cardboard sign to elicit sympathy. This causes his panhandling income to increase just enough to get him back to his pre-tax indifference curve. We would expect:
- A) His consumption of cigarettes to decrease and his consumption of alcohol is ambiguous
  - B) His consumption of cigarettes to increase and his consumption of alcohol to decrease
  - C) His consumption of cigarettes and alcohol to increase
  - D) His consumption of cigarettes to decrease and his consumption of alcohol to increase
41. (variation on old question) Fabian wants to get exactly 70% on the final. Fabian produces the exam score using two inputs: hours of study time and milligrams of a drug that helps him to concentrate. Which of the following statements is both necessarily correct and most informative
- A) His isoquant for producing a 70% result identifies all those combinations of study hours and milligrams of drugs that will just get him a score of 70%.
  - B) His isoquant for producing the 70% score identifies all the different ways he would like to achieve a 70% score.
  - C) His indifference curve for producing the 70% result identifies all those combinations of study hours and milligrams of drugs that will just get him a score of 70%.
  - D) His isoquant for producing a 70% result is the rate at which he can substitute study hours for milligrams of drugs in the production of the 70% score
42. Your budget **set** identifies \_\_\_\_\_. Your indifference **set** for bundle  $x^i$  identifies \_\_\_\_\_.
- A) all those bundles that exhaust your budget; all those bundles that you rank equal to bundle  $x^i$
  - B) all those bundles that you can afford; all those bundles that you rank equal to or higher than bundle  $x^i$ .
  - C) all those bundles that you can afford; all those bundles that you rank equal to bundle  $x^i$
43. A firm's cost function identifies the state of technical knowledge for producing the firm's output.
- A) Incorrect
  - B) Correct

44. (Zach) Mary Jane lives in a world of only two commodities: joints (marijuana cigarettes) and workouts. She enjoys both and the two goods are perfect substitutes: one workout is as good as two joints. Both goods are free and the amount of time it takes to smoke a joint and workout are the same. Unfortunately, Mary Jane cannot do both at the same time. Choose the answer that is both correct and most informative.
- A) Mary will consume joints and workouts in the ratio two joints for each workout
  - B) Mary will spend her life smoking joints and never workout.
  - C) Mary will be on the same indifference curve no matter what she does.
  - D) Mary will spend her life working out and will never smoke a joint
45. In lecture, we looked at an example where Professor Morey's daughter, Fred, was paid \$1 per mile skied. Fred's only cost was the value of her time, \$3 an hour. In order to maximize her profit, Fred will ski up the point where her marginal cost equals \$3.
- A) Incorrect
  - B) Correct
46. A question about your math skills and the math in the course. Which statement best describes you. (If you answer this question, it will be marked correct.)
- A) I find the use of basic algebra helpful for understanding concepts and answering questions, but would not be pleased if, in addition, derivatives and partial derivatives were sometimes uses to explain concepts and solve problems.
  - B) I struggle with the graphs and the math. My background in math is not strong enough given the level of graphs and math presented in class.
  - C) I find the use of basic algebra helpful for understanding concepts and answering questions, and would be pleased if, in addition, derivatives and partial derivatives were sometimes uses to explain concepts and solve problems.
  - D) I am comfortable with the graphs, but struggle with the equations. I would prefer the equations disappear or appear only in footnotes in the lecture notes.
47. The following is the "definition" of a cost function: The cost function identifies the amount of money a firm spends producing its output as a function of its output level, the prices of the inputs, and the quantities of its fixed inputs.
- A) **Incorrect**
  - B) Correct

As I have stressed and underlined, many times the cost function identifies the **minimum** amount of money the firm needs to spend as a function of its output levels, the price of its inputs, and the quantities its fixed inputs.

The critical word is minimum. A firm could spend more.

48. Can a competitive firm produce its profit-maximizing level of output, and not be maximizing its profits?
- A) No
  - B) Yes

Of course, it could be producing that level of output inefficiently (not at min cost)

49. Consider, as presented in class, Fred's production of snerd edibles. Fred is a competitive firm. Which of the following are exogenous to Fred?
- A) Only two of the other answers are correct.
  - B) the isoquants for producing edibles.
  - C) Three of the other answers are correct
  - D) the price of edibles
  - E) the state-of technology for producing edibles
50. Assume is the short-run and Fred is producing snerd edibles. Her fixed costs are zero and she is maximizing her profits producing some positive number of edibles, earning positive profits. Then consider Fred in the same situation except that she has some fixed costs. With these fixed costs,
- A) Her profit-maximizing level of output will be lower
  - B) Her profit-maximizing level of output will be the same as it was with no fixed costs.
  - C) Her profit-maximizing level of output will be higher because she has to cover these fixed costs

Note that initially Fred's profit-maximizing level of output is positive (rather than zero). Since, initially, she has not fixed costs, average costs and variable costs are the same, and she is producing at a level where here  $ac$  is less than the price (otherwise there would not be positive profits)

Draw the graph.

Then a fixed cost is introduced (a cost she will have to pay even if she produces zero snerds). This will create a wedge between  $ac$  and  $avc$ , but it will not affect her  $mc$  curve

Draw the graph.

Profits are maximized at the same point, where  $p=mc$ . She won't shut down because we know she is already covering her  $avc$ , so would lose more money if she shut down

## Answer Key

1. A
2. B
3. A
4. B
5. B
6. B
7. A
8. C
9. B
10. C
11. D
12. C
13. A, B, C
14. B
15. A
16. D
17. B
18. D
19. B
20. B
21. C None of the answers are correct. See explanation.
22. C
23. C
24. B
25. B
26. B
27. D
28. B
29. B
30. A
31. C
32. A
33. B
34. A
35. A
36. C
37. D
38. A
39. A
40. D
41. A
42. C
43. B
44. D

- 45. A
- 46. *(No Answer Provided)*
- 47. A
- 48. B
- 49. C
- 50. B