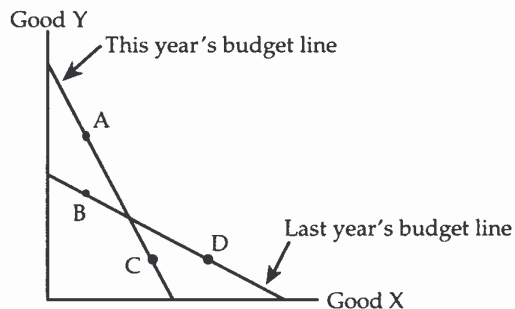


The following exam consists of 45 questions on 5 pages. Please check to see that you have all parts of the exam before beginning. The exam is worth 100 points. You have 90 minutes to complete the exam. Time may be a factor, so do not get stuck on any question. Only the answer in the designated area will be counted, include your scrap work with your name clearly written on it. Non-programmable calculators are permitted. Good Luck.

**A. 20 points. Multiple Choice:**

(2 points each)

- Assume that the demand curve for apples is downward-sloping and the supply curve for apples is upward-sloping. If the government imposes a sales tax of 10¢ per apple, then the price that suppliers receive for an apple
  - remains unchanged.
  - Falls by less than 10¢ per apple.**
  - Falls by exactly 10¢ per apple.
  - Falls by more than 10¢ per apple.
- Suppose that due to technological innovations, the absolute price of a recordable CD declines by 25% while the absolute price of a recordable cassette tape declines by 10%. In this situation, the price of the CD relative to the price of a tape
  - Falls.**
  - Rises.
  - remains the same.
  - changes unpredictably.
- A man can rewire a house in 12 hours and can panel a room in 15 hours. His teenage son can rewire a house in 18 hours and can panel a room in 16 hours. Who is more efficient in rewiring a house and who is more efficient in paneling a room?
  - The father is more efficient at both activities.
  - The father is more efficient at rewiring a house, and the son is more efficient at paneling a room.**
  - The father is more efficient at paneling a room, and the son is more efficient at rewiring a house.
  - The two are equally efficient at both activities.
- Suppose a consumer buys goods X and Y and is currently spending all of her income on some of both goods. If the marginal value of X is greater than the relative price of X, how can the consumer improve her level of satisfaction?
  - By purchasing more of both goods.
  - By purchasing more of good X and less of good Y.**
  - By purchasing more of good Y and less of good X.
  - The consumer cannot improve her level of satisfaction because she is at an optimum.



5. Which of the following changes is consistent with the situation shown in the diagram?
- The consumer's income fell.
  - The relative price of good X in terms of good Y fell.
  - The absolute price of good X rose, and the absolute price of good Y fell.**
  - The absolute price of both goods rose, with the price of good X rising by the higher percentage.
6. If the consumer purchased basket B last year and purchases basket C this year, we can conclude that
- the consumer is rational
  - the consumer's tastes changed between this year and last year.**
  - the consumer's indifference curves cannot be convex.
7. If demand for oil increases while all other relevant factors remain unchanged, then
- the quantity supplied of oil will rise.**
  - the supply of oil will rise.
  - the quantity supplied of oil will fall.
  - the supply of oil will fall.
8. Engel Curves for inferior goods slope
- Downward (negative slope)**
  - Upward (positive slope)
9. Demand curves for Giffen goods slope
- Downward (negative slope)
  - Upward (positive slope)**
10. The Cross Price Elasticity for two goods that are COMPLEMENTS is \_\_\_\_\_
- Greater than Zero
  - Equal to Zero
  - Less than Zero**

**B. 20 Points. Use the following information for questions 11 through 19. Show your work in the space provided on the top of the next page:**  
(Each blank is 2 points each.)

The demand equation is given by  $Q = -60P + 270$   
The supply equation is given by  $Q = 30P$

11. What is the equilibrium Price? 3

12. What is the equilibrium Quantity? 90

Now assume the government institutes an excise tax of 3\$ per unit.

13. An excise tax's legal incidence is paid by suppliers

14. What is the new price paid by consumers? 4

15. What is the equilibrium Quantity? 30

16. What is the Total *Revenue* received by the producers? \$30

17. When the government institutes a *sales* tax, the resulting market price goes down and the Quantity goes down

18. With this \$3 tax, what percentage of the tax was paid by producers? 2/3, 66.66%

19. If the Demand Curve changes so that the slope becomes steeper, would the answer to the previous question increase or decrease? \_\_\_\_\_decrease\_\_\_\_\_

**C. 20 points. Use the following information for problems 20 through 27:**  
(Each blank is 2 points each)

Utility Function:  $U = X \cdot Y^2$  where X is the amount of good X consumed and Y is the amount of good Y consumed.

$MU_x = Y^2$

$MU_y = 2YX$

Income (I) = \$48

$P_x = \$4$

$P_y = \$2$

20. What is the Marginal Value of X in terms of Y {  $MV_{x/y}$  }? 2

21. Write the equation of the budget constraint:  $y =$  24-2x

22. If I purchase no units of X, how much Y can I afford? 24

23. What is the optimal bundle of good X and Y?  $X =$  4  $Y =$  16

24. What Total Utility is received at the optimal bundle? 1024

Suppose the price of good Y increases from \$2 to \$4.

25. Derive the new optimal bundle of X and Y.  $X =$  4  $Y =$  8

26. From the information obtained about the consumption of good Y both before and after the price change, derive the equation of a linear demand curve for *good Y* that passes through both points.

$Q_y =$  -4P + 24

27. What is the elasticity of demand at the point in this region? -0.5

**D. 20 points. Questions 28 through 35 refer to the following table which shows the demand for a firm's product and the firm's total cost of production. The additional columns in the table are for your convenience only. They will not be graded.**

Demand					Costs	
Quantity	Price / unit	TR	MR	Profit	TC in \$	MC
0 units	\$22				\$4	
1	20				6	
2	18				10	
3	16				16	
4	14				24	
5	12				34	

(Each blank is worth 2 points each)

28. The marginal cost of producing the third unit is 6

29. The marginal revenue received from selling the fifth unit is 4

30. The profit from selling two units would be \_\_\_\_26\_\_\_\_
31. According to the equimarginal principle, how many units should the firm produce in order to maximize its profit? \_\_\_\_4\_\_\_\_
32. And what price should the firm charge to do this? \_\_\_\_\$14\_\_\_\_
33. And what would that profit be? \_\_\$32\_\_\_\_
34. Suppose the cost of producing an item increases by \$6 per item. What is the new profit maximizing quantity? \_\_\_\_3\_\_\_\_
35. Suppose the firm faces a flat tax of \$10 per period (but does not face the increased costs in #34), what is the optimal Q \_4\_ P\_ \$14\_ and Profit \_\_\$22\_.

**E. 10 points. Use the following information for questions 36-40.**  
(2 points each)

Herman has an income of \$20, which he spends on fishheads and all other goods. Fishheads cost \$2.00 a piece.

36. Suppose the government agrees to pay half of Herman's fishhead bill, so that now fishheads cost him \$1.00 apiece. He now chooses to buy 6 fishheads. Show how the government program affects Herman's budget line (draw his old and new budget lines; label them B1 and B2, respectively).

***B1: y-intercept at (0,20) x-intercept at (10,0); eqn:  $y = -2x + 20$***

***B2: y-intercept at (0,20) x-intercept at (20,0); eqn:  $y = x + 20$  (note, he consumes 6 with this subsidy which means his optimal point is 6, 20-6, or (6,14).***

37. What is Herman's optimal point under the conditions in #36? Label this point P. \_\_\_\_**(6,14)**\_\_\_\_

38. Now suppose the government ends the program in part (a) and replaces it with a cash gift of \$6. Show his new budget line in your graph above. Label it B3.

***B3: y-intercept at (0,26); x-intercept at (13,0); note, eqn of line is  $y = -2x + 26$  so (6,14) is on this line which means it passes through point P***

39. Does this new budget line pass above, below or through point P? \_\_\_\_**through**\_\_\_\_

40. Which of these programs does Harold prefer? Why? \_\_\_\_**cash, because it puts him on a higher IC**\_\_\_\_

**F. 10 Points. Use the following information for questions Q41-45.**

Suppose you have 24 hours per day that you can allocate between leisure and working at a wage of \$2 per hour.

41. Draw your budget constraint between "leisure hours" on the horizontal axis and "income" on the vertical axis and draw an indifference curve that illustrates your optimal point. Label this point A. Be sure to label your ***intercepts. (1 pt)***

***Should have initial budget line with y-intercept at (0,48) and x-intercept at (24,0)***

Suppose your wage increases to \$3 per hour.

42. Draw your new budget line in the diagram above. (1 pt)

*Should have new budget line with y-intercept at (0,72) and x-intercept at (24,0)*

43. According to the substitution effect, should your wage hike increase or decrease your leisure time? Why? decrease, because the price of leisure has gone up, so consume less of it (2 pts)

(Hint: What is the price of an hour of leisure? Has the price of leisure gone up or down? What does this mean in terms of the substitution effect?)

44. If leisure is a normal good, will the income effect of this wage hike increase or decrease your leisure time? Why? increase, the wage hike has made you "richer". Since you can work a fewer number of hours and earn the same amount of income, the income effect would say, work fewer and consume more leisure (2 pts)

(Hint: Are you poorer or richer due to the wage change? What does this mean in terms of the income effect?)

45. On your indifference curve diagram above, decompose the effect of the wage increase into a substitution effect and an income effect assuming leisure is a normal good and that the substitution effect is larger than the income effect of the wage increase. (Note: label and use the points A, B and C to illustrate the two effects) Has your leisure time increased or decreased due to this wage hike?

*It should decrease because the sub effect says decrease, income says increase and sub is greater, so decrease overall*

*Your sub effect should be A to C where C is left of A (decrease leisure) and where A and C are on same IC.*

*Your income effect should be C to B where B is to the right of C (increase leisure) and to the left of A (sub effect greater than income). B should be on NEW budget line which should be parallel to the budget line that is tangent at point C on the original IC.*