

Final Exam  
Econ 100-02  
Fall 1998

**IF YOU WOULD LIKE TO RECEIVE PARTIAL CREDIT THEN YOU MUST SHOW ALL OF YOUR WORK.**

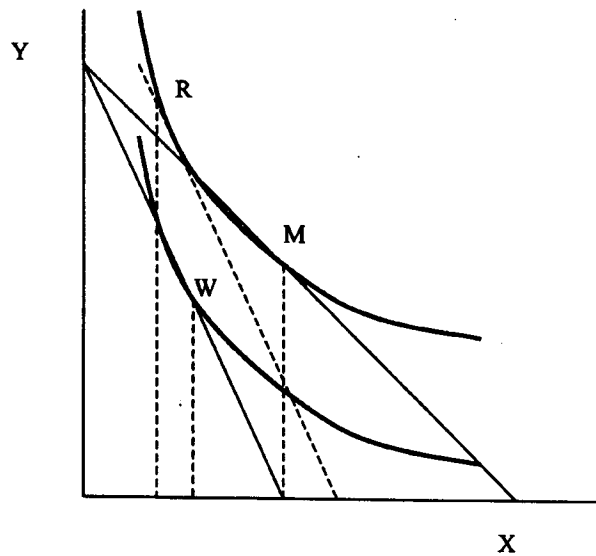
Questions 1-7 are each worth 4 points.

1) If Peter's utility function for apples and bananas is  $U(A,B)=\min\{A,5B\}$ , then apples and bananas must be

- a) perfectly elastic
- b) perfect substitutes
- c) perfect complements
- d) perfectly inelastic

2) The diagram below indicates that X is

- a) normal and a Giffen good
- b) inferior and a Giffen good
- c) inferior but not a Giffen good
- d) a Giffen good but not inferior



- 3) Which of the following sentences best describes the output effect?
- a) the change in the amount of a good produced by a firm, when the price of the good changes
  - b) then change in the amount of a good produced by a firm when the price of an input changes
  - c) the change in the amount of input used by a firm when the price of the good it produces changes
  - d) the change in the amount of input used by a firm when the amount of the good it produces changes
- 4) Susan is a saver. This means that when the interest rate falls the income effect will cause her to
- a) increase her current consumption and reduce future consumption
  - b) increase both her current consumption and her future consumption
  - c) decrease her current consumption and decrease future consumption
  - d) decrease her current consumption and increase future consumption
- 5) The demand for CD's is  $C=2/I + P_c - P_s$ . Where  $P_s$  is the price of stereo's. Stereo's are a normal good. From this demand equation, we can see that CD's
- a) are inferior, giffen and complements with stereos.
  - b) Are inferior, not giffen, and complements with stereos.
  - c) Are normal, not giffen and complements with stereos
  - d) Are normal, not giffen and substitutes with stereos.
- 6) If a firm's profits are negative, then it should stay open only if
- a) it is the short run and  $P > AVC$
  - b) it is the short run and  $P < AVC$
  - c) it is the long run and  $P > AVC$
  - d) it is the long run and  $P < AVC$
- 7) The production function for Firm X is  $F(K,L)=K^2 + L^2$ . This firm exhibits
- a) constant returns to scale
  - b) increasing returns to scale
  - c) a downward sloping marginal revenue product curve for labor
  - d) a downward sloping marginal revenue product curve for capital

8) Yummy Bakeries production function for muffins is  $F(K,L)=K^2+\log L$ . Yummy Bakeries charges \$1 for its muffins. The cost of one unit of labor is \$.25 and the cost of one unit of capital is 2. How many muffins should Yummy Bakeries produce? What will its profits be when it produces this many muffins? (10 points)

$$\pi = K^2 + \log L - .25L - 2K$$

$$\frac{d\pi}{dL} = \frac{1}{L} - .25 = 0 \quad \frac{d\pi}{dK} = 2K - 2 = 0$$

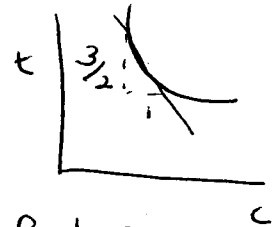
$$L = 4 \quad K = 1$$

check  $\pi > 0$ ?  $\pi = 1 + \log 4 - .25 \cdot 4 - 2$   
 $1 + 1.39 - 1 - 2 < 0$

since  $\pi < 0$   
 it shouldn't produce any muffins.

9) Gary's utility function for chess and tennis is  $U=(3c+2)t^2 = 3ct^2 + 2t^2$ . If Gary starts with 1 game of chess and 5 games of tennis, how many games of tennis would he be willing to give up to play another game of chess? (5 points)

$$-\frac{\frac{\partial U}{\partial c}}{\frac{\partial U}{\partial t}} = MRS = -\frac{3t^2}{6ct + 4t} = -\frac{75}{50} = -\frac{3}{2}$$



He'd be willing to give up  $3/2$  games of tennis to play one more game of chess

10) Professor Harris grades her students according to whether they write well, do well on exams, and speak up in class. If student A is better than student B in two of these characteristics then Professor Harris gives student A a higher grade than student B. If student B is better than student A in two of these characteristics then Professor Harris gives student B a higher grade than student A. Otherwise, they get the same grade.

Judy writes eloquently, fails exams, and asks one question per week.

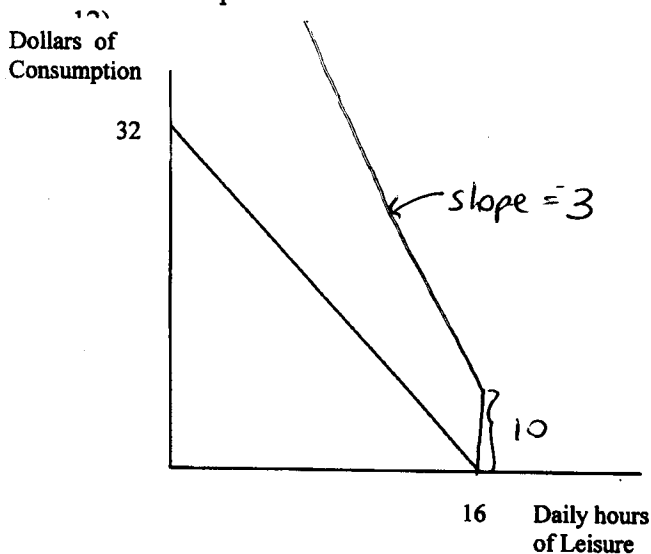
Alice writes eloquently, gets 100% on exams, but never asks any questions in class.

Barbara writes poorly, gets 50% on exams, and asks one question per class.

- a) Which student will Professor Harris give a higher grade to, Judy or Alice? (5 points) Indifferent - same grade  
 b) Does Professor Harris have transitive preferences? (5 points)

Since  $J \sim A$ ,  $A > B$  but  $B > J$   
 preferences are not transitive

- 11) The diagram below shows Andy's budget constraint for two goods-leisure and consumption.



- a) What is Andy's wage rate? (3 points) \$2  
 b) A new policy is implemented. This policy would give Andy a daily subsistence guarantee of \$10. At the same time, a minimum wage is implemented. The new minimum wage is \$3. How do these two policy changes affect Andy's budget constraint? Show on the diagram above. What is the new Y intercept? (7 points)

$$Y \text{ intercept} = 16 \cdot 3 + 10 = 58$$

- c) Discuss the likely effects of the policy changes on Andy's hours of work. Use the notions of income and substitution effects. (7 points)

Guarantee of \$10  $\rightarrow$  income effect  $\rightarrow$  richer  $\uparrow$  L  $\downarrow$  H work

$\uparrow$  W  $\rightarrow$  income  $\rightarrow$  richer  $\rightarrow$   $\uparrow$  L  $\downarrow$  H work

sub  $\rightarrow$  leisure more expensive  $\rightarrow$   $\downarrow$  L  $\uparrow$  H

So you can't predict what will happen to hours worked

- 12) Rain City, WA is considering holding a rain festival. The cost of the festival would be \$100,000. It is hoped that the festival would make enough of an advertising splash that in the following year tourism would bring in \$150,000. How low would the interest rate need to be in order to make the festival worthwhile? (6 points)

$$\text{set } PV B = PVC$$

$$\frac{150,000}{1+i} = 100,000$$

$$1.5 = 1+i \quad i = .5$$

interest rate would have to be .5 or less

- 13) Tony's demand equation for flowers is  $F=10-P_f^2-P_A$  where  $P_f$  is the price of flowers and  $P_A$  is the price of all other goods. If  $P_f=2$  and  $P_A=1$  then will Tony spend more or less money on flowers when the price of flowers rises? (Hint: you need to calculate the price elasticity of demand to get full credit). (10 points)

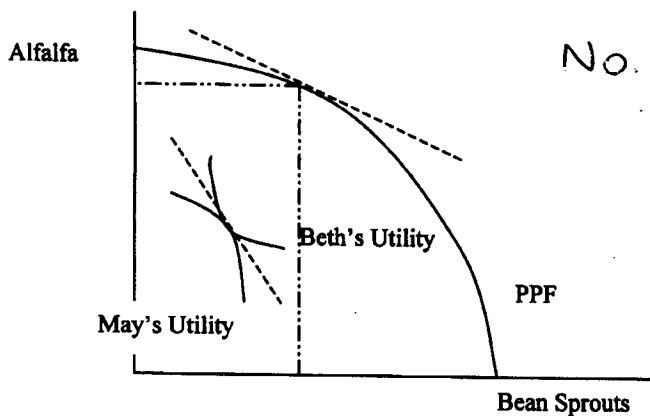
$$e_{lab} = \frac{\partial F}{\partial P_f} \cdot \frac{P_f}{F} \quad \frac{\partial F}{\partial P_f} = -2P_f \quad e = -2P_f \cdot \frac{P_f}{F}$$

$$e = -\frac{2P_f^2}{F} \quad F = 10 - 2^2 - 1 = 5$$

$$e = -\frac{2(4)}{5} = -\frac{8}{5}$$

Flowers are elastic. So when  $P_f \uparrow$  total exp on flowers falls.

- 14) Is the economy below in general equilibrium? Why or why not? (9 points)



No.  $MRS \neq MRT$ .

- 15) A firm's production function is  $F(L)=L^{1/2}$ . Find an equation that describes the firm's demand curve for labor. Under what circumstances will the demand for labor be equal to 0? Will these conditions ever occur? (10 points).

$$pL^{1/2} - wL = \pi$$

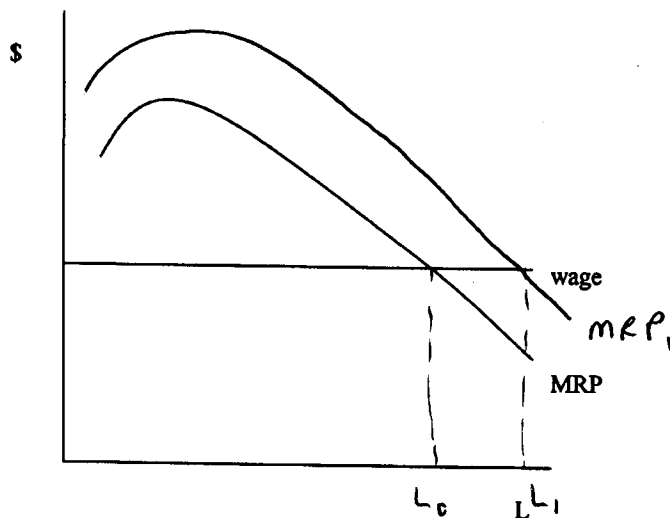
$$\frac{\partial \pi}{\partial L} = \frac{1}{2}pL^{-1/2} - w = 0$$

$$L^{-1/2} = \frac{w}{p} \cdot 2$$

$$L^{1/2} = \frac{p}{2w}$$

$$L = \left(\frac{p}{2w}\right)^2$$

- 16) The diagram below shows the marginal revenue product curve for labor and the marginal factor cost (wage). Show what happens to these curves and to the profit maximizing amount of labor that should be hired when the price of the output good increases. (5 points)



$\pi$  max amount labor  $\uparrow$ .