Econ 3144 - Spring 2007
Test 2 - Dr. Rupp

Name $\qquad$
"I have neither given nor received aid on this exam" $\qquad$ (signature)
The following formula might be useful: $\mathrm{E}_{\mathrm{p}}=(\mathrm{P} / \mathrm{Q}) *(1 /$ slope $)$
I. Discussion Questions (12.5 points each... 50 points total):

1. The demand for ski lift tickets at Sugar Mountain is $Q=1,200-18 \mathrm{P}$, where P is the price of lift tickets (in dollars) and Q is the number of tickets sold.
a. If the price per ticket is $\$ 45$, how much revenue does Sugar Mountain earn? (3 points)
b. What is the price elasticity of demand for ski lift tickets at this price? (hint: calculate a number, 3 points)
c. In words, precisely interpret the price elasticity number that you calculated in (b). (3.5 points)
d. Based on the information above, what should Sugar Mountain do to increase their revenue? (3 points)
2. 

| East Lake |  | West Lake |  |
| :---: | :---: | :---: | :---: |
| \# of <br> Boats | Average \# <br> Fish | \# of <br> Boats | Average \# <br> of Fish |
| 1 | 40 | 1 | 50 |
| 2 | 39 | 2 | 46 |
| 3 | 38 | 3 | 42 |
| 4 | 37 | 4 | 38 |
| 5 | 36 | 5 | 34 |

a. Using the above chart, suppose Madison has 5 fishing boats. What is the optimal method of allocating 5 fishing boats between these two lakes? [No credit given if you don't show your work] ( 6.5 points)
b. Based on your answer from (a), how many fish will be caught from the East Lake? (2 points)
c. Based on your answer from (a), how many fish will be caught from the West Lake? (2 points)
d. How many total fish are caught? Show your work. (2 point)
3. Your company owns two t-shirt making plants: one plant in Ayden and the other in Grimesland with the following marginal cost and average total cost curves (subscripts A \& G denote Ayden and Grimesland, respectively):

$$
\begin{array}{ll}
\mathrm{MC}_{\mathrm{A}}=1 / 2 \mathrm{Q}_{\mathrm{A}} & \mathrm{ATC}_{\mathrm{A}}=1 / 4 \mathrm{Q}_{\mathrm{A}} \\
\mathrm{MC}_{\mathrm{G}}=2+\mathrm{Q}_{\mathrm{G}} & \mathrm{ATC}_{\mathrm{G}}=2+1 / 2 \mathrm{Q}_{\mathrm{G}}
\end{array}
$$

a. What is the least costly way of producing 40 t-shirts? ( 6.5 points)
b. How much did it cost to produce the t-shirts selected in (a) from plant A? (2 points)
c. How much did it cost to produce the $t$-shirts selected in (a) from plant B? (2 points)
d. What is the total cost to produce 40 t-shirts? (2 point)
4. Complete the following table for the short-run cost curves for the production function: $\mathrm{Q}=2 \mathrm{KL}$ where in the shortrun K is fixed at 2 units, with the rental price of capital $=\$ 2$ and the wage rate $=\$ 2$. (1.5 points per column)

| Workers | Output | TC | VC | FC | ATC | AVC | AFC | MC |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 0 |  |  |  |  | -- | -- | -- | -- |
| 1 |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |

*Extra Credit Eligibility - You must meet these two criteria to answer extra credit questions.

- Please skip these extra credit questions if your cell phone rang in class since the $1^{\text {st }}$ test
- Please skip these extra credit questions if you are not taking this test during the normally scheduled time in class (Thu. March $22^{\text {nd }}$ at 11 am )

Extra Credit (+2): In plain English (I don't want a mathematical definition) tell me what is marginal cost?

Extra Credit (+2): In words tell me what does the equation $\mathrm{MP}_{\mathrm{L}} / \mathrm{w}$ mean? $\left(\mathrm{MP}_{\mathrm{L}}\right.$ is marginal product of labor \& w is wage)
II. Multiple Choice: (20 questions, worth 2.5 points each... 50 points total)

Use the following table to answer the next two questions:

| Labor | Output | Marginal Product | Average Product |
| :---: | :---: | :---: | :---: |
| 0 | 0 | -- | -- |
| 1 |  | 10 |  |
| 2 | 30 |  | 20 |
| 3 |  |  |  |
| 4 | 80 |  |  |
| 5 |  | 15 |  |

1. What is the marginal product from the $3^{\text {rd }}$ worker?
A) 10
B) 20
C) 30
D) 40
E) 50
2. Do diminishing returns to labor appear in the above chart? If so, where does this occur?
A) Yes, after the $1^{\text {st }}$ worker is hired
B) Yes, after the $2^{\text {nd }}$ worker is hired
C) Yes, after the $3^{\text {rd }}$ worker is hired
D) Yes, after the $4^{\text {th }}$ worker is hired
E) No (diminishing returns are not exhibited in the above graph).

Use the table below to answer the next three questions:

| Q | Fixed Cost | Variable <br> Cost | Total Cost | Marginal <br> Cost | Average <br> Fixed Cost | Average <br> Variable <br> Cost | Average <br> Total Cost |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 0 |  |  |  | -- | -- | -- | -- |
| 1 |  | 50 |  |  |  |  |  |
| 2 |  |  |  | 28 |  |  |  |
| 3 | 50 |  |  |  |  | 32.67 |  |
| 4 |  |  | 162 |  |  |  |  |

3. What is the marginal cost of producing the fourth quantity?
A) 20
B) 8
C) 15
D) 12
E) 14
4. What is the average variable cost of making the second quantity?
A) 39
B) 33.33
C) 28
D) 25
E) 64
5. What is the total cost when quantity equals 0 ?
A) 0
B) 25
C) 12
D) 20
E) 50
6. If your income increases by $10 \%$ while your spending on the good increases by a larger proportion (say $14 \%$ ), then economists call this type of good a(n):
A) Giffen good
B) inferior good
C) Engel good
D) luxury good
E) necessary good
7. What would you expect the sign of the cross-price elasticity of demand to be between peanut butter and jelly?
A) positive
B) negative
C) zero
8. The defining attribute of a natural monopoly is:
A) a declining fixed cost curve
B) an increasing marginal cost curve
C) a declining marginal revenue curve
D) a declining long-run average cost curve
9. Find the returns to scale for the following function: $\mathrm{Q}=2 \mathrm{~K}+4 \mathrm{~L}$
A) increasing returns to scale
B) decreasing returns to scale
C) constant returns to scale
10. What is an isoquant?
A) various input combinations that yield the same output.
B) how easily can capital can be substituted for labor.
C) various input combinations that cost the same.
D) various combinations of goods that yield the same utility
E) the change in capital divided by the change in labor

Use the following information to answer the next two questions: Summit Lawn can hire workers to cut grass at $\$ 50$ per day and can a unit of capital (lawn mowers) for $\$ 20$ per day. Currently Summit Lawn spends $\$ 200$ per day.

K
11. In the space above, draw an isocost curve for Summit Lawn spending $\$ 200$. What is the slope of this isocost curve?
A) $-1 / 10$
B) $-2 / 5$
C) $-5 / 2$
D) -2
E) -4
12. At a wage of $\$ 50$ per day to hire workers and rental prices of $\$ 20$ per day for capital (lawn mowers), Summit Lawn is currently hiring 4 workers and renting 3 machines. The marginal product of workers $=20$ and the marginal product of machines=10. Given this information, what recommendation would you give Summit Lawn?
A) Rent more machines and fire workers.
B) Rent fewer machines and hire workers.
C) Don't change anything, since Summit Lawn is already optimally using its inputs.

Use the graph below to answer questions 13-16.

13. If $M=\$ 100, P_{Y}=\$ 1$, and $P_{X}=\$ 2$. Find the best affordable bundle.
A) A
B) B
C) C
D) D
E) E
14. Suppose the price of $X$ decreases from $P_{X}=\$ 2$ to $P_{X}=\$ 1$. Everything else is unchanged ( $M=\$ 100 \& P_{Y}=\$ 1$ ). The total effect is represented by moving from point $\qquad$ to point $\qquad$ .
A) A to B
B) D to A
C) D to B
D) C to D
E) B to D
15. The substitution effect due to the price of $X$ decreasing is represented as moving from point $\qquad$ to point $\qquad$ .
A) B to A
B) D to A
C) A to B
D) A to C
E) C to D
16. The income effect due to the price of X decreasing is represented as moving from point $\qquad$ to point $\qquad$ .
A) D to A
B) C to B
C) B to C
D) D to B
E) A to B
17. If Jerry and Ben's demand curves are: $P=12-4 Q_{J}$ and $P=12-2 Q_{B}$, respectively. Find the market demand curve.
A) $\mathrm{P}=12-(1 / 3) \mathrm{Q}$
B) $\mathrm{P}=24-(1 / 6) \mathrm{Q}$
C) $P=12-(4 / 3) Q$
D) $P=9-(2 / 3) Q$
E) $P=12-(3 / 4) Q$
18. If demand is $\mathrm{P}=13-2 \mathrm{Q}$, find the price elasticity of demand if $\mathrm{P}=3$.
A) $-3 / 10$
B) $-3 / 5$
C) $-6 / 5$
D) $-5 / 6$
E) $-10 / 3$
19. How do you interpret a price elasticity of supply of 1.2?
A. If prices rise by $\$ 1$, then quantity supplied increases by 1.2 units
B. If prices rise by $\$ 1$, then quantity supplied increases by $1.2 \%$
C. If prices fall by $1 \%$, then quantity supplied increases by $1.2 \%$
D. If prices fall by $1 \%$, then quantity supplied falls by $1.2 \%$
E. If prices rise by $1 \%$, then quantity supplied increases by $12 \%$
20. Which of the figures below indicate a production function that has increasing returns to scale?
A) Figure 1
B) Figure 2
C) Figure 3
Figure 1 Figure 2

