Introduction to Microeconomics

Week 8

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Question 1

Laura's utility function is given by $U = T^{0.4}M^{0.6}$, where M is live music, and T is sound tracks. The price of music tracks is given by \$0.5 and the price of live music is \$1. Her budget is $Y = \$30$.

A) Derive expressions for her (Marshallian) demand for T and M.

B) Find her optimal consumption bundle (T, M).

C) Now suppose the price of a sound track doubles. Calculate the income effect and substitution effect.

Question 2

Which of the following is NOT an axiom related to technology?

A) No free lunch.

B) Non-reversibility.

C) Completeness.

D) Convexity.

Question 3

What is the Average Product of Labour for the production function $Q = 25K^{1/3}L^{2/3}$?

1. $25K^{1/3}L^{-1/3}$
2. $25K^{-1/3}L^{1/3}$
3. $25K^{1/3}L^{1/3}$
4. $25K^{-1/3}L^{-1/3}$

Question 4

What is the short-run marginal product of labor?

A) The change in output per unit change in labor, holding capital fixed.

B) The change in labor per unit change in output, holding capital fixed.

C) The change in capital per unit change in labor, holding output fixed.

D) The change in labor per unit change in capital, holding output fixed.

Question 5

Which equations represent a production function with perfectly substitutable inputs?
Hint: Perfectly substitutable inputs are substitutable at any constant rate, and not necessarily at a rate of 1:1.

A) $Q = \sqrt{L} + \sqrt{K}$

B) $Q = \sqrt{KL}$

C) $Q = \sqrt{K + L}$

D) $Q = 4K + L$

E) $Q = min\{K, L\}$

Question 6

Which equations represents a production function with constant returns to scale?

A) $Q = \sqrt{L} + \sqrt{K}$

B) $Q = \sqrt{KL}$

C) $Q = 4K + L$

D) $Q = 4k + 4L$

E) $Q = min\{K, L\}$

$Q' = \sqrt{2L} + \sqrt{2K} = \sqrt{2}\left(\sqrt{L} + \sqrt{L}\right)$

$Q' = \sqrt{2}\,Q$ increasing.

Question 7

Under what conditions does the production function $Q = L + L^{\alpha}K^{\beta} + K$ exhibit constant returns to scale?

A) $\alpha + \beta = 0$

B) $\alpha + \beta = 1$

C) $\alpha + \beta + 1 = 0$

D) There cannot be any constant returns to scale

Question 8

Anne produces paper boats using the production function $Q = 10K^{0.4}L^{0.6}$ where K is the sheets of paper and L is hours of labour. What is her MRTS?

A) $-1.5K/L$

B) $-1.5L/K$

C) $-0.67K/L$

D) $-0.67L/K$

Reference Reading

1. *The Economy 2.0: Microeconomics* by CORE Econ.
2. *Introduction to Economic Analysis v. 1.0*
3. *Workouts in Intermediate Microeconomics 6e* by Hal Varian
4. *Microeconomics* by Jeffrey Perloff
5. *Microeconomics* by Pindyck and Rubenfield