Econ 311 - Intermediate Microeconomics
Final Exam

University of Oregon

June 11, 2025

Version 2

Give every question your best shot.
Fear is the mind-killer.

Name: _____ 95#: _____

You have a total of 1h 50min (110 minutes) to complete the exam.
The only items allowed on your desk at any time are pens/pencils, scratch paper, a 3x5 note card, and a calculator. Everything else must be stored in your bag underneath your desk.
If you need to use the bathroom during the exam, leave your phone on the table in the front of the classroom. Please wait until there are no phones currently on the table before you go to the bathroom.
Any form of cheating will result on a zero on the exam.

There are three sections to be completed:

- Multiple Choice: 10 Questions (worth 3 points each)
- Short-Answer Questions: 4 Questions (worth 10 points each)
- Multi-Part Analysis Questions: 1 Question (worth a total of 30 points)

Point totals and question specific instructions are listed for each section. Please ask for clarification if a question is not clear to you.

The exam is a total of 9 pages. Please verify you have all 9 in your exam. If you do not, let me know immediately.

Multiple Choice

Question 1. (3 P.)
What type of returns to scale does the production function $F(L, K) = L^{2/5}K^{1/5}$ feature?

a) not enough information
b) increasing
c) constant
d) decreasing

Question 2. (3 P.)
Suppose a firm with the production function $F(L, K) = L^2K^3$ is currently using 10 machines and 10 workers ($K = L = 10$). If the amount of labor decreases by 1 worker, how much **Capital** (approximately) would have to be added to keep the original level of production?

a) 1/2 machine
b) 2 machines
c) 2/3 machine
d) 3 machines

Question 3. (3 P.)
Currently, a firm with a cost function of $C(q) = \frac{1}{3}q^3$ is producing 10 units in a perfectly competitive market in which the market price is \$10 per unit. Is the firm producing *too much*, *too little*, or are they *profit-maximizing?*

a) Too little
b) Profit-maximizing
c) Not enough information
d) Too much

Question 4. (3 P.)
What is the **average total cost function** for a firm with the cost function $C(q) = 3q^3 + 6q^2 - 10q + 18$?

a) $9q^3 + 12q^2 - 10$
b) $18/q$
c) $3q^3 + 6q^2 - 10q$
d) $3q^2 + 6q^1 - 10 + 18/q$

Question 5. (3 P.)
How do monopolistic markets compare to perfectly competitive markets?

a) monopolies lead to lower price and lower quantity
b) monopolies lead to higher price and higher quantity
c) monopolies lead to higher price and lower quantity
d) monopolies lead to lower price and lower quantity

Question 6. (3 P.)
For a **monopolist** with a marginal cost function of $MC(Q) = 9Q^2$ who faces a market demand curve of $P = 20 - Q$, solve for their profit-maximizing quantity.

a) 20
b) 1
c) 2
d) 1/2

Question 7. (3 P.)
Imagine a short-run market made up of 10 firms who each have an individual supply curve of $q_s = 1/5P$. If the demand curve is $Q_D = 100 - 8P$, what is the market equilibrium price?

a) $P^* = 10$
b) $P^* = 2$
c) $P^* = 1/5$
d) $P^* = 8$

Question 8. (3 P.)
Which of the following would cause the short-run supply curve to shift **outward**?

a) Decrease in number of firms
b) Decrease in input prices
c) Increase in consumer incomes
d) Increase in input prices

Question 9. (3 P.)
If firms are producing *above* the minimum of their **average total cost** curve, what will happen in the **long-run**?

a) New firms will *enter* the market and drive the price **up**
b) Existing firms will *exit* the market and drive the price **down**
c) Existing firms will *exit* the market and drive the price **up**
d) New firms will *enter* the market and drive the price **down**

Question 10. (3 P.)
Which type of competition has firms compete on *price-setting* instead of *quantity-setting*?

a) Monopoly
b) Bertrand
c) Stackelberg
d) Cournot

Short Answer

Question 11. (10 P.)
Imagine a firm with the cost function $C(Q) = \frac{1}{3}Q^3 - 380Q + 66$. Currently, the firm can sell its product for a price of \$20. What is the short-run profit maximizing quantity?

Question 12. (10 P.)
Consider the behavior of a monopolist firm with no competitors. Suppose the demand curve they face is $P = 720 - Q$ where the single firm sets the entire market quantity supplied, Q. Also, for simplicity suppose that the firm's marginal cost is zero dollars per unit produced.

- Derive the monopolist firm's **marginal revenue** function.
- Use this to **solve for maximum amount of profit** (in dollars) they could earn.

Question 13. (10 P.)

Consider a car assembly line that produces Q cars by combining robotic arms K, and human workers, L using the following production function:

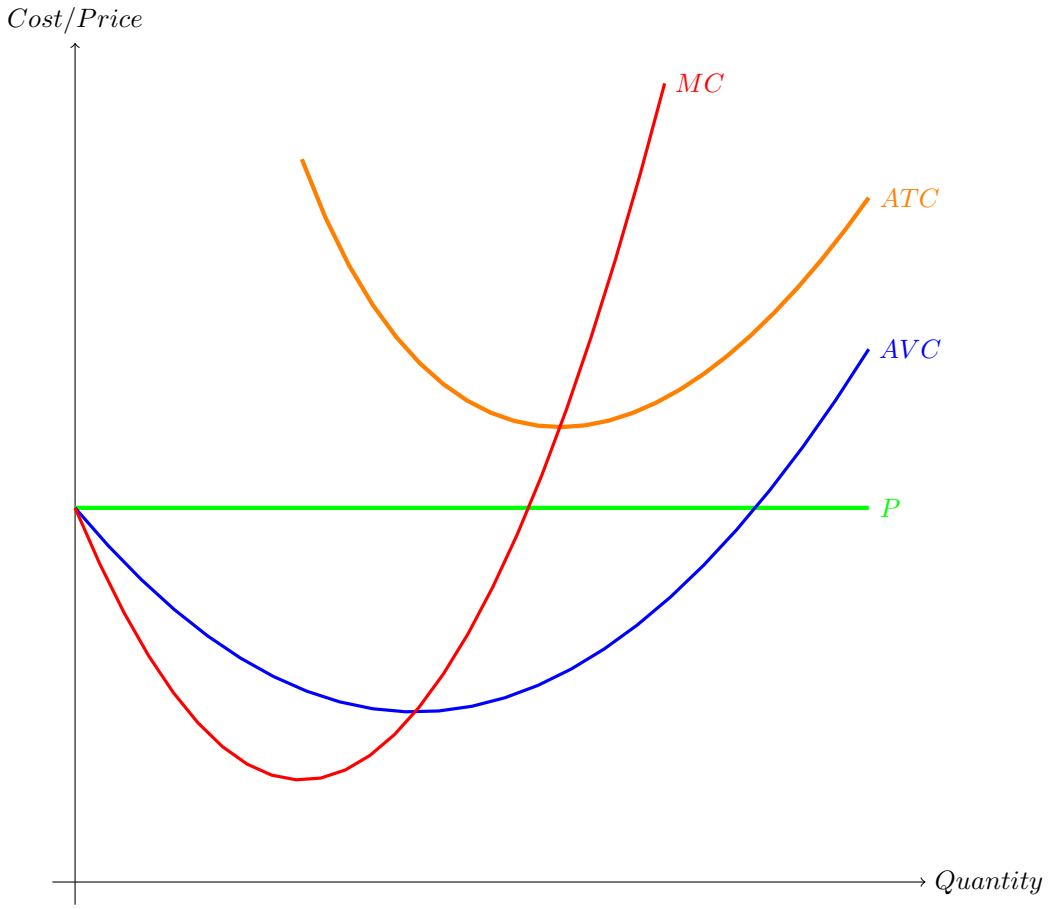
$$Q = f(K, L) = K \cdot L$$

Suppose that each robotic arm costs \$90 per hour to rent and that each human worker is paid an hourly wage of \$30.

What is the cheapest combination of K and L to assemble $Q = 3$ cars per hour?

Question 14. (10 P.)
Consider the production decision of a firm who's production costs are represented by the marginal cost MC, average variable cost AVC, and average total cost ATC curves below.

- Suppose that in the **short-run**, the perfectly competitive market price is at a level represented by the horizontal line labelled P. Illustrate how much quantity the firm will produce in the short run on the graph.
- Now explain what will happen to this market in the **long-run** if firms are allowed to enter or exit. Use the graph to explain your answer.



Long Answer

Question 15. (30 P.)
In this question, we will look at the different outcomes when two firms compete against each other. There are firm 1 and firm 2 and they have identical marginal cost functions of $MC_1(q) = MC_2(q) = 3q+9$. Assume that the goods produced by each firm are identical and they both face the demand curve $P = 59 - Q^D$. The total market quantity supplied is equal to the sum of firm 1 and firm 2's production: $Q^S = q_1 + q_2$

(a) (8 P.) First, solve for what would happen in the market if both firms act as **price-takers**. Solve for the total market supply curve under this assumption and use it to find the P^* and Q^* in this 'perfect competition' equilibrium.

(b) (4 P.) How likely do you think that the predicted market price and quantity will occur if these are the only firms in this market and there are high fixed costs which prevent any other firms entering the market.

Justify your answer based on what we have discussed in the second half of this class.

Now consider a Cournot duopoly model with the same two firms competing based on quantities.

(c) (3 P.) Write out the profit function for firm 1 based on their own production strategy q_1 as well as their rival firm's quantity q_2. Assume that they have to choose q_1 at the same time that firm 2 sets q_2.

(d) (4 P.) Use your answer from part (c) to derive a best-response rule that tells firm 1 how much q_1 they should produce as a function of q_2.

(e) (3 P.) What is firm 2's best response rule?

(f) (8 P.) Use your best response functions to solve for a Nash equilibrium in the simultaneous Cournot competition game.