CONCORDIA COLLEGE
MOORHEAD, MINNESOTA

- Name: _____
- Date: _____

# BUS 201: Principles of Global Economics

# Quiz #3: Suggested Solutions

# Fall 2025

**INSTRUCTIONS:**

- Write your name, date, and section clearly at the top of the first page.
- This is a closed-book quiz. You may not use your textbook, class notes, or electronic devices.
- The quiz consists of three parts: Definitions, Multiple Choice, and Short Answers.
- For definitions, write in complete sentences. Limit each definition to 3 sentences.
- For True/False questions, write `TRUE` or `FALSE` for each statement. If the statement is `FALSE`, provide a brief one- to two-sentence justification.
- For multiple-choice questions, circle the single best answer. Only one option is correct.
- For short-answer questions, write your responses in complete sentences. Limit your response to 5 sentences or fewer.
- The total time allowed is 100 minutes. Manage your time carefully.

**Problem 1. Definitions** **(3 Points Each)**

Select six items on the list of items below, and provide a definition of the items that you chose.

- Externality
- External Cost
- Pigouvian Tax
- Public Good
- Common Resource
- Marginal Cost
- Efficient Scale
- Price Taker
- Non-rivalry

- Externality:
  An externality is the uncompensated impact of one person's actions on the well being of a bystander. It can be positive (external benefit) or negative (external cost).
- External Cost:
  An external cost is a cost of production or consumption that falls on people who are not directly involved in the transaction. It is not reflected in the private cost faced by buyers or sellers.
- Pigouvian Tax:
  A Pigouvian (corrective) tax is a per unit tax designed to make private decision makers take account of the external costs of their actions. The efficient Pigouvian tax equals the marginal external cost at the socially optimal quantity.
- Public Good:
  A public good is non excludable and non rival in consumption. One person's use does not reduce others' ability to use it, and it is difficult or impossible to prevent people from using it.
- Common Resource:
  A common resource is non excludable but rival in consumption. People cannot easily be prevented from using it, but one person's use reduces the availability for others.
- Marginal Cost:
  Marginal cost is the increase in total cost when the firm produces one more unit of output. It is equal to the change in total cost divided by the change in quantity.
- Efficient Scale:
  The efficient scale of a firm is the quantity of output that minimizes average total cost. It corresponds to the bottom of the U shaped ATC curve.
- Price Taker:
  A price taker is a buyer or seller that cannot influence the market price and must accept the price determined by market supply and demand. Competitive firms are price takers.
- Non rivalry:
  A good is non rival if one person's consumption does not reduce the amount available for others. Many types of information and national defense are examples.

**Problem 2. True or False** **(3 Points Each)**

Determine whether the following statements are either TRUE or FALSE. If you deem that the statement is TRUE, there is no need to justify your answer. If you deem that the statement is FALSE, you MUST justify your verdict by providing an explanation.

2.A. A negative externality leads the market to produce more than the socially efficient quantity.

- TRUE

2.B. Goods that are non-excludable and non-rival are likely to be overprovided by private markets.

- FALSE
- These are public goods. Because of free riding, private markets tend to underprovide public goods, not overprovide them.

2.C. If price above average variable cost but is below average total cost, a competitive firm should shut down in the short run.

- FALSE
- Firms in the short-run will continue its production as long as $P \geq AVC$.

2.D. In the long run, free entry and exit cause firms in a competitive market to earn zero economic profit.

- TRUE

**Problem 3. Multiple Choice** **(3 Points Each)**

3.A. A positive externality causes:

a) Overproduction relative to the social optimum
**b) Underproduction relative to the social optimum**
c) No change in market output
d) A shift in supply but not demand

3.B. Which policy directly aligns private costs with social costs?

a) Production subsidy
**b) Corrective tax**
c) Price ceiling
d) Quantity restriction

3.C. A public good is:

a) Rival and excludable
b) Rival and non-excludable
**c) Non-rival and non-excludable**
d) Non-rival and excludable

3.D. A congested public road during rush hour is best classified as:

a) A public good
b) A private good
**c) A common resource**
d) A club good

3.E. Diminishing marginal product implies that:

a) Total cost must be constant
b) Average fixed cost increases with output
c) Firms always shut down
**d) Marginal cost eventually rises**

**Problem 3. Multiple Choice (continued)** **(3 Points Each)**

3.F. The efficient scale of a firm is the quantity where:

a) Marginal cost equals price
**b) Average total cost is minimized**
c) Fixed costs are minimized
d) Economic profit is zero

3.G. A competitive firm's marginal revenue equals:

**a) The market price**
b) Zero in equilibrium
c) Its average total cost
d) Its marginal cost at all quantities

3.H. A firm will shut down in the short run if:

a) Price < Average Total Cost
**b) Price < Average Variable Cost**
c) Price < Marginal Cost
d) Variable Cost equals Fixed Cost

3.I. When new firms enter a competitive market:

a) Market supply decreases
b) Price rises and profit increases
**c) Price falls and profit decreases**
d) Profits rise for existing firms

3.J. The tragedy of the commons occurs because:

a) Common resources are non-rival
**b) Individuals ignore the external costs of their actions**
c) Government policies reduce usage
d) There is no private demand

**Problem 3. Multiple Choice (continued)** **(3 Points Each)**

3.K. Which of the following shifts the marginal cost curve upward?

a) An increase in fixed cost
b) Improved worker productivity
**c) Diminishing marginal product**
d) A reduction in input prices

3.L. A firm earns zero economic profit in the long run when:

**a) Price equals average total cost**
b) Price equals average variable cost
c) Total revenue is zero
d) Marginal cost is constant

3.M. Which of the following best describes fixed cost?

a) It increases with output
b) It is zero in the long run
**c) It must be paid even if output is zero**
d) It always exceeds variable cost

**Problem 4. Short Answers** **(10 Points Each)**

4.A. A factory emits noise that disturbs nearby residents. The residents do not mind the factory operating during the daytime, but the factory owner wants to run the factory overnight as well. If the factory operates at night, it earns an additional profit of $20,000 per week. The residents collectively suffer a loss of quiet that they value at $25,000 per week. You are a mediator who can (1) assign and enforce property rights regarding nighttime quiet, and (2) facilitate negotiations with zero transaction costs between the residents and the factory. Answer the following questions:

- What is the socially efficient (welfare-maximizing) outcome: should the factory operate at night or not? Briefly explain using the numbers given.
  - Night operation gives the factory an extra $20,000 per week but costs residents $25,000 in lost quiet, so the socially efficient outcome is no night operations.

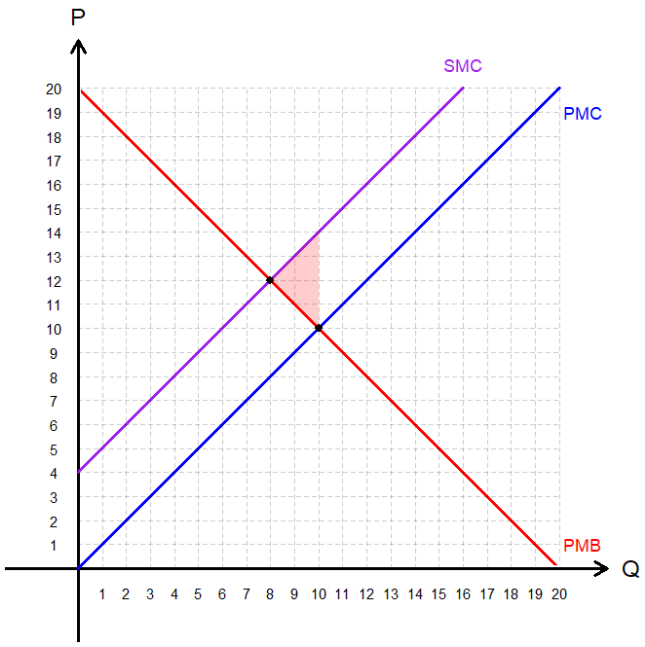
- Suppose the residents have the legal right to a quiet environment at night. Describe a possible Coasean bargain (who pays whom and how much) that could leave both sides better off compared to no agreement.
  - The default is no night operation. To get permission to run at night, the factory would need to pay residents at least $25,000, but the factory gains only $20,000. There is no payment that makes both sides better off, so there is no bargain and the outcome remains no night operation.

- Now suppose the factory has the legal right to operate at night. Describe a possible Coasean bargain that could still achieve the efficient outcome. Who would pay whom, and why?
  - The default is night operation. Residents lose $25,000, while the factory gains $20,000. Residents could offer the factory a payment between $20,000 and $25,000, for example $22,500, in exchange for stopping night operation. Both sides are better off, and the outcome is again no night operation with a side payment from residents to the factory.

- Does the final outcome (night operation vs no night operation) depend on who initially holds the property right in this example? Briefly explain what this illustrates about the Coase Theorem.
  - In both cases the efficient outcome is no night operation, although the income distribution differs. This illustrates the Coase Theorem which tells us that when property rights are clearly defined and transaction costs are zero, private bargaining can achieve the efficient allocation of resources regardless of who initially holds the right.

**Problem 4. Short Answers (continued)** **(10 Points Each)**

4.B. Consider a market for tobacco that is modeled by the following Private Marginal Benefit (PMB) and Private Marginal Cost (PMC) curves. Unbeknownst to the market participants, consumption of tobacco generates a per-unit external cost of $4. Answer the following questions:




- In the graph above, plot the Social Marginal Cost (SMC) curve.

- What is the private market equilibrium quantity?
  - The private market acts on PMC and PMB, so 10 units.
- What is the socially optimal quantity?
  - The private market acts on SMC and SMB (=PMB in this case), so 8 units.
- What is the value of the deadweight loss caused by the externality? You may indicate the deadweight loss on the graph instead of calculating a numerical value.
  - The triangular area between SMC and PMC over the range of quantities from the market output to the socially optimal output, $4
- As the social planner, what per-unit tax would you impose to guide the market to the socially optimal quantity?
  - The optimal Pigouvian tax equals the marginal external cost, so $4 per unit.

**Problem 4. Short Answers (continued)** **(10 Points Each)**

4.C. Answer the following questions about firm behavior in competitive markets. Be sure to use complete sentences and refer to the relevant cost curves (MC, AVC, ATC) when appropriate:

- Suppose firms in a competitive market are currently earning positive economic profits. Explain what happens to the market in the short run and in the long run. Use the concepts of price, supply shifts, and average total cost to describe the adjustment process.
  - In the short run, existing firms earn positive economic profit because price is above average total cost, and each firm produces where P=MC.
  - Over time, positive profits attract entry of new firms. Entry shifts the market supply curve to the right, which lowers the market price.
  - This process continues until price falls to the point where the market price equals the lowest point of ATC and economic profit is zero. In long run equilibrium, firms produce at the efficient scale and earn zero economic profit.

- Why does marginal cost determine a firm's output decision in both the short run and the long run, but average total cost determines whether the firm stays in the market in the long run? Explain the economic intuition behind this distinction.
  - In a competitive market, the firm is a price taker, so it chooses its output where marginal cost equals marginal revenue, and since MR=P, this is where MC=P. That condition determines the profit maximizing quantity in both the short run and the long run.
  - The decision to stay in or exit the market depends on whether the firm can cover all of its costs. If $P \geq ATC$, the firm earns zero or positive economic profit and remains in the industry, but if $P < ATC$, it exits in the long run.
  - Marginal cost is about whether producing one more unit adds more to revenue than to cost, while average total cost is about whether operating in the market is profitable overall.

**Problem 5. Extra Credit** **(5 Points)**

5. Suppose that a firm in a competitive market faces the following cost structure. The table is intentionally left incomplete:

| Q | TC | FC | VC | MC |
|---|---|---|---|---|
| 0 | $150 | $150 | $0 | - |
| 1 | $200 | $150 | $50 | $50 |
| 2 | $240 | $150 | $90 | $40 |
| 3 | $290 | $150 | $140 | $50 |
| 4 | $350 | $150 | $200 | $60 |
| 5 | $420 | $150 | $270 | $70 |
| 6 | $500 | $150 | $350 | $80 |

- Fill in all missing values for FC.
- Fill in all missing values for VC.
- Fill in all missing values for MC.
- What is the profit-maximizing quantity if the market price is $70?
  - In a perfectly competitive market, individual firms' MR=P.
  - Profit maximizing firms produce up to the quantity where MR=MC, so 5 units.

- Original Score: _____
- Original Date: _____
- Recovered Score: _____
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