

**SI-ECON 315**  
**Mock Exam 1- Spring 2021**

**Chapter 1**

1. net present value calculation
  - $PV = FV/(1+i)^t$
  - $PV \text{ Firm} = \sum \Pi t/(1+i)^t$
  - $PV \text{ (Perpetuity)} = CF/i$
  - $PV \text{ Firm} = \Pi_0 (1+i)/(i-g)$
  - $NPV = PV - \text{amount necessary to generate income}$
2. estimation of firm value assuming constant growth of current profit
  - $PV \text{ Firm} = \Pi_0 (1+i)/(i-g)$

**Chapter 2**

3. supply/demand analysis – prediction of equilibrium price/quantity

| D | S | E*P      | E*Q      |
|---|---|----------|----------|
| → |   | increase | increase |
| ← |   | decrease | decrease |
|   | → | decrease | increase |
|   | ← | increase | decrease |
| → | → | ?        | increase |
| ← | ← | ?        | decrease |
| → | ← | increase | ?        |
| ← | → | decrease | ?        |

4. price floors/price ceilings – intentions and consequences
  - Price ceiling: govt imposed maximum price
    - Shortage
    - Imposed below  $E^*p$
  - Price floor: govt imposed minimum price
    - Surplus
    - Imposed above  $E^*p$

**Chapter 3**

5. calculation of price elasticity of demand using the point formula
  - Point formula:  $ED = (dQ/dP) * (P)/(Q)$  [use when given a demand function]

- Arc Formula:  $ED = \% \text{ change of } Q / \% \text{ change of } P$
6. estimation of change in total revenue given price elasticity of demand information and change in price
- If  $|ED| > 1$ ,  $P \downarrow$   $TR \uparrow$   
(elastic)  $P \uparrow$   $TR \downarrow$
  - If  $|ED| < 1$ ,  $P \downarrow$   $TR \downarrow$   
(inelastic)  $P \uparrow$   $TR \uparrow$

### X, O Game

|  |  |   |   |   |
|--|--|---|---|---|
|  |  |   | O | O |
|  |  |   |   | O |
|  |  | X |   | O |
|  |  |   |   | O |
|  |  |   | X | X |

### 1. Net present value calculation of multiple future dollar amounts using the basic present value formula. ■

A firm is considering two investment alternatives identified as Option 1 and Option 2. Option 1 will cost the firm \$180,000 today, and it will receive \$560,000 in four years. Option 2 will cost the firm \$210,000 today, and it will receive \$600,000 of profit in five years. Assuming the discount rate is 4%, which of the following statements is correct regarding Option 1 in comparison to Option 2?

| Option 1   | Option 2   |
|--|--|
| $PV1 = (560,000)/(1+0.04)^4 = 478,690$<br>FV1= 560,000<br>$NPV1 = 478,690 - 180,000 = 298,690$ | $PV2 = (600,000)/(1+0.04)^5 = 493,156$<br>FV2= 600,000<br>$NPV2 = 493,156 - 210,000 = 283,156$ |

- Option 1 has a higher future value, a lower present value, but the same net present value.
  - Option 1 has a higher future value, a higher present value, and a lower net present value.
  - Option 1 has a higher future value, a higher present value, and a higher net present value.
  - Option 1 has a higher future value, a lower present value, and a lower net present value.
  - Option 1 has a lower future value, a lower present value, and a higher net present value.
2. Calculation of the present value of a firm given current profit, assumed constant growth rate, and an interest rate

A firm's current profits are \$600,000. These profits are expected to grow indefinitely at a constant annual rate of 3 percent. If the firm's opportunity cost of funds is 8 percent, what is the value of the firm? ■■■■■

$$600,000(1+.08)/(.08-.03) = 12,960,000$$

### 3. Calculation of the present value of a constant dollar amount received annually

What is the value of a preferred stock that pays a perpetual dividend of \$290 at the end of each year when the interest rate is 7 percent? ■■■■■

$$C/i = 290 / 0.07 = 4142$$

### 4. Demand-supply analysis: predict the outcome for equilibrium price/quantity based on some observations

Assume that the market for Good X is in equilibrium and the following occurs: the government removes an excise tax, there is an expectation among consumers of a higher price, and there is a decrease in the price of a complement. Which of the following correctly summarizes the outcome for the market of Good X? ■■■■■

The government removes an excise tax: Supply → Right

There is an expectation among consumers of a higher price: Demand → Right

There is a decrease in the price of a complement: Demand → Right

E\*P is uncertain and E\*Q increases

### 5. Given total benefit and cost functions, calculation of quantity where net benefits are maximized

$$MB = MC$$

The total benefit and total cost from a continuous activity are,  $B(Q) = 200 + 40Q - 2Q^2$  and  $C(Q) = 60 + 8Q$ . At what quantity is the net benefit maximized. ■■■■■

$$MB = 40 - 4Q$$

$$MC = 8$$

$$40 - 4Q = 8$$

$$Q = 8$$

### 6. Interpretation of a firm's demand function

The demand function in a market is as follows:  $Q = 1000 - 5P$ . The corresponding supply function is  $Q = -600 + 3P$ . If the government places a price restriction at \$210 this would be a price \_\_\_\_\_ because it is \_\_\_\_\_ the equilibrium price of \_\_\_\_\_. ■■■■■

a. Floor, below, 220

b. Floor, above, 200

c. Ceiling, below, 260

d. Ceiling, above, 200

e. None of the above

$$1000 - 5P = -600 + 3P$$

$$P = 200$$

**7. Given a demand function, derive the inverse demand function and use it in a graph/calculation**

A market's demand and supply functions are as follows:  $Q_d = 500 - P/4$ , and  $Q_s = P/2 - 100$ . Find the inverse functions.

$$Q_d = 500 - P/4$$

$$P/4 = 500 - Q_d$$

$$P = 2000 - 4Q_d$$

$$Q_s = P/2 - 100$$

$$Q_s + 100 = P/2$$

$$2Q_s + 200 = P$$

**8. Given demand/supply functions and a government restriction, determine the type of restriction and quantify the resulting problem (shortage/surplus)**

A minimum wage is an example of a price floor and can be expected to cause a surplus of labor (higher unemployment.) **T/F** ████

**9. When the total benefit is maximized, the marginal benefit is positive. T/F**

**10. Given demand and supply functions, determine market equilibrium**

A market's demand and supply functions are as follows:  $Q_d = 500 - P/4$ , and  $Q_s = P/2 - 100$ . Determine the equilibrium price and quantity.

$$2Q_s + 200 = 2000 - 4Q_d$$

$$6Q = 1800$$

$$E * Q = 300$$

$$E * P = 2000 - 4(300) = 800$$

**11. Given a demand function, calculate consumer surplus at a certain price**

The supply function for a firm is given by the following:  $Q_s = -120 + 5P$ . What is the producer surplus at a price of \$50? ██████████

$$Q_s = -120 + 5P$$

$$Q_s = -120 + 5(50)$$

$$Q_s + 120 = 5P$$

$$Q_s = 130$$

$$(Q_s/5) + 24 = P$$

$$PS = \frac{1}{2} * (50 - 24) * 130 = 1690$$

**Make sure you draw a graph for this problem**

**12. Price elasticity of demand calculation using the point formula**

The demand function for a good is as follows:  $Q_d = 1,820 - 12P$ . What is the price elasticity of demand at a price of \$80? ██████████

$$ED = (dQ/dP) * (P)/(Q)$$

$$Q_d(80) = 1820 - 12(80) = 860$$

$$Ed = -12 * (80/860) = -1.116$$

**13. Price elasticity of demand calculation using the arc formula**

A pizza shop sold 242 slices of pizza on a day when it charged \$3.30 per slice. On a different day, it charged \$2.80 per slice and sold 326 slices. What is the price elasticity of demand? Do not round intermediate steps, but round your final answer to two decimal places. ██████████

$$Q_2 - Q_1 = 326 - 242 = 84$$

$$(Q_2 + Q_1)/2 = 242 + 326/2 = 284$$

$$P_2 - P_1 = 2.80 - 3.30 = -\frac{1}{2} = -0.5$$

$$(P_1 + P_2) / 2 = (3.30 + 2.80) / 2 = 61 / 20 = 3.05$$

$$(84 / 284) / (-0.5 / 3.05) = -1.8$$

**14. Analysis of a situation involving price elasticity of demand, a change in price, and impact on total revenue**

When a car repair facility decreased the price of one of its services by 6%, the quantity demanded increased by 8%. The price elasticity of demand in this case was \_\_\_\_\_ and the firm's total revenue from this service \_\_\_\_\_

- a. -1.33, increase
- b. -1.33, decrease
- c. -0.75, increase
- d. -0.75, decrease

$Ed = 0.08 / -0.06 = -1.33 =$  It's elastic. Since the price decreases, the TR will increase.

**15. Given demand and supply functions, calculate deadweight loss**

A market's demand and supply functions are as follows:  $Q_d = 500 - P/4$ , and  $Q_s = P/2 - 100$ . Assume the government sets a rule that the selling price cannot go above \$400. What is the deadweight loss with the price restriction in place? \_\_\_\_\_

If you see the word "ABOVE": it should be price ceiling

"BELOW": it should be on the price floor.

$$P_d = 2000 - 4Q$$

$$P_s = 200 + 2Q$$

$$2000 - 4Q = 200 + 2Q$$

$$6Q = 1800 \rightarrow E * Q = 300$$

$$E * P = 200 + 2 * 300 = 800$$

**16. Given a firm's demand function, calculate maximum total revenue**

A firm's demand function is as follows  $Q_d = 8,400 - 1.2P$ . What is the maximum total revenue the firm could earn?  $TR = P * Q$  (14,700,00).

$$P_d = 7000 - Q_d / 1.2$$

$$Q_d \text{ at } P=0 \text{ is } Q_d = 8,400$$

$$P_d \text{ at } Q_d = 0 \text{ is } P_d = 7,000$$

$$\text{Midpoint for } Q_d = 8,400 / 2 = 4,200$$

$$\text{Midpoint for } P_d = 7,000 / 2 = 3,500$$

$$TR = P * Q = 4,200 * 3,500 = 14,700,00$$

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Use the midpoint

**17. Given cross-price elasticity of demand information for two goods, determine their relationship and quantify the effect of a given change**

**OS-S and SS- C: use to determine the relationship between the two goods**

**PN-NI (positive-normal and negative-inferior) (Income): used to determine the type of good.**

Assume the demand function for Good J is given by the following:

$Q_J = 6,000 - (1/2)P_J + P_K - 9P_L + (1/5)M$ , where  $P$  is the price of Good J,  $P$  is the price of Good K,  $P$  is the price of good L, and  $M$  is income. What is the relationship between

Good J and Good K: Sub

Good J and Good L: Com

What is good J? Normal

**18. Given a regression printout, calculate the quantity of a good sold at a certain price.**

**19. Given a regression printout, evaluate how good the model is**

Use this information to answer the questions

|                   |             |
|-------------------|-------------|
| Multiple R        | 0.5666529   |
| R Square          | 0.321095234 |
| Adjusted R Square | 0.283378342 |
| Standard Error    | 14.95651103 |
| Observation       | 20          |

Significance F is 0.009186067

|           | Coefficients | P-value     |
|-----------|--------------|-------------|
| Intercept | 370.95       | 1.45441E-15 |
| Price     | -27.6        | 0.009186067 |

Approximately what percentage of the variation in the dependent variable is “explained” by changes in the independent variable? ■

- a. 8.51%
- b. 9.18%
- c. 14.96%
- d. **None of the above (use adjust R s= 0.28= 28%).**

Assume that alpha = 0.05. What action should be taken? ■

- a. Accept the null hypothesis and conclude that price is statistically significant in “explaining” changes in the number of pens sold.
- b. Accept the null hypothesis and conclude that price is not statistically significant in “explaining” changes in the number of pens sold
- c. Accept the null hypothesis and conclude that price is not statistically significant in “explaining” changes in the number of pens sold
- d. **Reject the null hypothesis and conclude that price is statistically significant in “explaining” changes in the number of pens sold.**

**P-value <0.05, reject null hypothesis, and there is a significant relationship.**

Estimated how many pens the store will sell at a price of \$3.50 per pen. (The number of pens sold were entered in units. For example, 200 pens were entered as 200. Round your answer to the nearest whole unit. ■)

- a. 189
- b. 260
- c. 274
- d. 330

$$\hat{y} = 370.95 - 27.6P = 370.95 - 27.6*(3.5) = 274$$

**20. Given a price elasticity of demand value, interpret the number**

The cross-price elasticity of demand between goods X and Y is -1.43 and the income elasticity of demand for good X is -1.18. What is the relationship between X and Y and what good is Good X?

**CPEd = -1.43: complement**

$(+)/(+) > 0$ ,  $(-)/(-) > 0$  : sub  $\rightarrow > 0$  : sub

$(+)/(-) < 0$ ,  $(-)/(+) < 0$  : com  $\rightarrow < 0$  : com

Income elasticity = -1.18

> 0: Normal

< 0: Inferior

## 21. Analysis involving inverse demand, price elasticity of demand, total revenue, and marginal revenue

Which of the following is correct at the quantity corresponding to the exact midpoint of a straight, downward-sloping inverse demand curve?

- Marginal revenue is equal to zero, total revenue is maximized, price elasticity of demand is equal to one (in absolute value).
- Price elasticity of demand is greater than one (in absolute value), total revenue is maximized, marginal revenue is positive.
- Price elasticity of demand is equal to one (in absolute value), marginal revenue is equal to one, total profit is maximized.
- Marginal revenue is positive, total profit is maximized, price elasticity of demand is greater than one (in absolute value).
- Price elasticity of demand is equal to one (in absolute value), marginal revenue is equal to one, total profit is maximized.

## 22. Given inverse demand and supply functions, evaluate market conditions at a specific price

A firm's demand function is as follows  $Q_d = 8,400 - 1.2P$ . What would be the firm's price elasticity of demand if it charged a price of \$4,000? Is the firm elastic or inelastic?

$$E_D = (dQ/dP) * (P/Q)$$

$$dQ/dP = -1.2$$

$$P = 4,000$$

$$Q = 8,400 - 1.2 * 4,000 = 36,000$$

$$Ed = -1.2 * (4000/36,000) = -1.33 = 1.33 = \text{elastic.}$$

## 23. Accounting profit and economic profit comparison/contrast (conceptual)

Which of the following statements is correct regarding accounting profit and economic profit?

There is more than one correct answer to this question.

- If a firm has an accounting loss it cannot have an economic profit. (T)
- If a firm has an accounting break even it must have an economic break even. (F)
- If a firm has an economic profit it must have an accounting profit. (T)
- If a firm has an economic break even it must have an accounting profit. (T)
- If a firm has an accounting profit it must have an economic profit. (F)

## 24. Which of the following will cause an increase in present value? (D)

- An increase in the time period
- None of the choices listed is correct.
- A lower future value

d. A lower interest rate

$$PV = FV / (1+i)^t$$

**25. Estimation of price elasticity of demand based on influences on price elasticity**

A firm sells a good that consumers need **urgently and has few substitutes**. It is likely that the price elasticity of demand is \_\_\_\_\_ one (in absolute value) and the demand for the good is \_\_\_\_\_. **(C)**

**Few substitutes and urgent: ppl will buy no matter what the price is, which means they don't care about the price: inelastic → smaller than 1.**

- a. Greater than, inelastic
- b. Less than, elastic
- c. Less than, inelastic**
- d. Greater than, elastic

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