

## Homework 3 – KEY

Average: 77.47 + Opts GI bonus

Due on 5/9/2023, by 23:00

This assignment is optional but STRONGLY RECOMMENDED. If you do not submit the answers till the deadline, the score of your final exam will substitute for the score for this assignment. Submit only the correct letter for each task on eLearn under 'Quizzes' within 'COR2100-Economics and Society G7-8-26-49'. Note that the actual text of questions and answers is not supposed to appear on the eLearn quiz. You have unlimited attempts. The system is programmed to credit your last attempt. Be informed that if you submit an attempt and afterwards you re-open the quiz, you must submit your answers AGAIN. Otherwise, the system will grade the unfinished attempt with 0 (because it is the last one) and there is NOTHING I can do to fix this after the fact. Late homework or homework submitted outside eLearn cannot be accepted as this would violate SMU official policy for fairness and transparency in grading. This assignment is protected by Grade Insurance™: If the assignment's average turns out to be below 75, an equal amount of bonus points will be given to every work, for the average to become 75. Direct any homework questions to your TA.

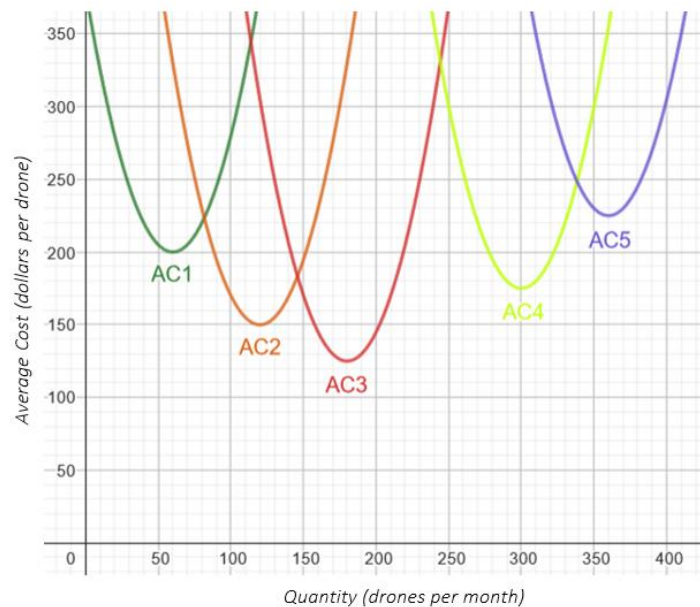
1. ✓ Which of the following is most accurate about the AC, AVC and MC curves in the short-run period?
- 97%A. **MC cuts AC at its minimum.** *[MC and AC curves intersect at AC's minimum]*
- B. MC cuts AC at its maximum.
- C. MC is always above the AVC. *[MC is above the AVC curve, as long as AVC is increasing and below the AVC curve, as long as AVC is decreasing]*
- D. MC is always below AVC.
2. ✓ Which of the following products is LESS likely to be homogeneous among different brands?
- A. Paper straws.
- B. Salt.
- 96%C. **A 55" smart TV.**
- D. Lemons.
- [Paper straws, salt and lemons are considered to be homogeneous goods, since consumers cannot find differences between different brands-producers of them]*
3. Which of the following is true for the distance between AC and AVC as production increases?
- A. It remains constant.
- 69%B. **It decreases.**
- C. It increases.
- 16%D. At first it increases and after some point it decreases.
- 11%E. At first it decreases and after some point it increases.
- [Since  $AC = AVC + AFC$  or  $AC - AVC = AFC$ , the difference between AC and AVC is equal to the AFC. As long as the production increases, the AFC decreases because FC is divided by an increasingly larger number of units]*
4. Which of the following is most likely to represent a firm's cost function?
- A.  $C = 500 - 2q$ .
- 67%B.  $C = 30 + 6\sqrt{q}$ .
- C.  $C = 1000 + 50/Q$ .
- 31%D. All of the above.
- [The variable part of the cost function must increase with q]*

- 5✓ Which of the following is true about sunk costs in economic decision making?
- A. They should always be taken into consideration.
  - 88%B. **They should never be taken into consideration.**
  - C. They should only be taken into consideration if they can be recovered.
  - D. They should only be taken into consideration if they are fixed.
  - E. They should only be taken into consideration if they are variable.
- [Sunk costs should not be taken into consideration when making decisions, because regardless the outcome you cannot recover them]*
- 6✓ Which of the following is considered to be a characteristic of a PC market?
- A. Some firms can influence the market price, while others cannot. *[No firm can influence the market price in PC]*
  - 97%B. **Firms' market share has no influence on price.** *[In PC, firms hold a tiny market share which make it practically impossible for them to influence the market price]*
  - C. Small firms can sell their product at a higher market price. *[Firms which set their price above the market price have zero sales]*
  - D. Big firms can sell their product at a higher market price.
7. Suppose that a delivery firm's cost for insuring its vehicles increases from \$1,000 to \$1,200 per vehicle. Which of the following is accurate?
- 31%A. MC will increase.
  - B. AVC will decrease.
  - 30%C. Both AVC and MC will increase.
  - 40%D. **None of the above.**
- [Insurance cost is per vehicle but not per delivery. Thus, only FC will increase]*
8. Which of the following is true for a firm in the S-R, as long as MC is above AC curve?
- A. The firm experiences Increasing Returns to Scale.
  - 76%B. **The firm experiences Diminishing Returns to Scale.**
  - C. The firm experiences Constant Returns to Scale.
  - 15%D. None of the above.
- [As long as MC is above AC curve, the latter is upward sloping]*
- 9✓ Which of the following factors of production is more likely to be variable for a firm?
- A. Capital.
  - 99%B. **Labor.**
  - C. Land.
  - D. Entrepreneurship.
- [As we explained in class, labor is usually the easiest factor for a firm to adjust in the short-run]*
- 10✓ Which of the following is true regarding a profit maximizing firm in a PC market?
- 11%A. It sets its price equal to its marginal cost. *[Profit is maximized when the cost for producing an extra unit equals the market price]*
  - B. Its marginal revenue is equal to the market price. *[In PC, firms are price-takers, so the revenue of an additional unit will be equal to the market price]*
  - 83%C. **Both A and B.**
  - D. None of the above.

**Scenario 3.1:** A firm can produce 60,000 bottles with 4 alternative combinations of capital (K) and labor (L): (i) 120K and 40L; (ii) 100K and 60L; (iii) 70K and 50L; or (iv) 50K and 70L.

- 11.\* According to scenario 3.1, which of the following is accurate?
- A. Combination (i) is economically less efficient than (ii). [We cannot tell because (ii) uses less K but more L than (i)]
  - 31%B. Combination (ii) is economically less efficient than (iii). [Because (iii) can produce the same with less of both K and L]
  - C. Combination (iii) is economically less efficient than (iv). [We cannot tell because (iv) uses less K but more L than (iii)]
  - 60%D. None of the above is accurate.

- 12.✓ According to scenario 3.1, if the per unit cost of capital is 40 and the per unit cost of labor is 30, which of the following combinations is the most economically efficient?
- A. (i). [Cost is  $40 \cdot 120 + 30 \cdot 40 = \$6,000$ ]
  - B. (ii). [Cost is  $40 \cdot 100 + 30 \cdot 60 = \$5,800$ ]
  - C. (iii). [Cost is  $40 \cdot 70 + 30 \cdot 50 = \$4,300$ ]
  - 32%D. (iv). [Cost is  $40 \cdot 50 + 30 \cdot 70 = \$4,100$ ]



**Figure 3.1:** The S-R average cost curves for 5 different scales of production for a firm that produces drones.

- 13.✓ According to figure 3.1, how much is firm's long-run average cost if the output is 300 drones per month?
- A. Around \$100.
  - B. Around \$125.
  - C. Around \$150.
  - 34%D. Around \$175.
  - E. Around \$200.
- [The L-R average cost curve can be thought as the lower envelope of all scales of production. So, from the AC4 we can see that in the scale of 300 drones per month, the corresponding price is \$175 per drone]

14. Suppose that the firm in figure 3.1 has committed to scale AC5 and later turns out that the monthly demand is around 320 drones. Which of the following is true?
- A. The firm experiences Constant Returns to Scale.
  - 49%B. **The firm experiences Increasing Returns to Scale.**
  - 34%C. The firm experiences Diminishing Returns to Scale.
  - 16%D. We have no sufficient information to answer.
- [320 drones are at the decreasing segment of AC5]*

15. According to figure 3.1, over which of the following ranges of production does the firm face Economies of Scale?
- 78%A. **From 0 to 150 drones per month.**
  - 16%B. From 150 to 250 drones per month.
  - C. From 250 to 350 drones per month.
  - D. From 350 drones per month and above.
- [Until the production of around 175 drones per month, the L-R average cost decreases, which means that the firm will be facing Economies of Scale]*

16. According to figure 3.1, which of the following could explain firm's LAC between 200 and 300 drones per month?
- 70%A. **Ineffective communication between managers and employees.** *[At this level of production the firm faces Dis-economies of Scale, while communication inefficiency would indeed increase its LAC]*
  - B. Firm can order larger quantities of raw materials at a lower price. *[This would lead to decreasing LAC (Economies of Scale)]*
  - 11%C. Firm needs more capital to increase workers' productivity. *[Firms face this problem only when thinking in the S-R]*
  - 13%D. Firm needs more workers to increase existing capital's productivity. *[Firms face this problem only when thinking in the S-R]*

$q$	$MC$	$VC$
1	30	30
2	26	56
3	20	76
4	24	100
5	30	130
6	42	172
7	53	225

**Table 3.1:** quantity ( $q$ ),  $MC$  and  $VC$  for a PC firm.

17. Refer to table 3.1. If the market price is \$24, which of the following is most likely for this firm, if cost conditions do not change?
- A. To keep operating.
  - 71%B. **To shut down immediately.**
  - C. To exit the market in the long-run.
  - 25%D. We need information about firm's fixed cost to answer.
- [At the price of \$24, the firm will produce 4 units and its average variable cost will be  $AVC = 100/4$  or  $AVC = 25$ . Since the price is below its  $AVC$ , the firm will shut-down immediately]*

18. Refer to table 3.1. If the fixed cost of the firm is \$20 and the market price is \$42, which of the following is most likely for this firm if cost conditions do not change?

77%A. **To keep operating.**

B. To shut-down in the short-run.

14%C. To exit the market in the long-run.

D. We need information about firm's fixed cost to answer.

*[At the price of \$42, the firm will produce 6 units. At this level, firm's average variable cost will be  $AVC = 172/6$  or  $AVC = 28.67$ , its total cost will be  $C = VC + FC$  or  $C = 172 + 20$  or  $C = 192$  and average total cost  $AC = 192/6$  or  $AC = 32$ . Thus, at the price of \$42 the firm will cover both its  $AVC$  and  $AC$ , so it will keep operating as long as this cost conditions hold]*

19. Refer to table 3.1. If the fixed cost is \$20, for which price will the maximum profit for the firm be zero in the long-run?

A. Around \$20.

B. Around \$25.

71%C. **Around \$30.**

D. Around \$40.

10%E. Around \$50.

*[The firm is setting  $p = MC$ . In order for the profit to be zero it should be  $p = AC$ , so we are looking for the  $MC$  for which  $MC = AC$ .  $C$  can be calculated as  $VC + FC$  or  $VC + 20$  and then  $AC = C/q$ . As we can see,  $MC = AC$  when  $q = 5$ , where  $MC = AC = 30$*

$q$	$MC$	$C$	$VC$	$AC$	$AVC$
1	30	50	30	50	30
2	26	76	56	38	28
3	20	96	76	32	25.33
4	24	120	100	30	25
5	<b>30</b>	150	130	<b>30</b>	26
6	42	192	172	32	28.67
7	53	245	225	35	32.14

20. Refer to Table 3.1. If fixed cost is \$20 and the market price is \$53, how much is the profit for the firm?

A. Around \$100.

86%B. **Around \$125.**

C. Around \$150.

D. Around \$175.

E. Around \$200.

*[At the price of \$53, the firm will produce 7 units and its revenue will be  $7 \cdot 53 = 371$ . The total cost of the 7 units is  $225 + 20 = 245$ , thus the profit is  $371 - 245 = 126$ ]*