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Economics 201

Midterm #2
Note that on the last page of this exam, there are equations provided (as discussed in class).

Part 1. Multiple Choice Questions (2 points each question)

1. One advantage of forming a corporation is:
a. unlike partnerships, corporations can raise money by borrowing from financial institutions
b. the owners of a corporation have limited liability
c. corporations tend to have lower bureaucratic costs than sole proprietorships
d. corporations are better able to utilize work and risk sharing arrangements than partnerships
e. all of the above

2. Which firm type is characterized by the separation of owners and operators (i.e. managers):
a. sole proprietorship
b. partnership
c. corporation
d. all of the above

3. When a firm commits to purchasing "specialized resources", what happens?
a. there is a switching cost that results directly from making this decision
b. the opportunity cost of purchasing this equipment is too high
c. the firm will increase its marginal cost
d. the firm will increase the price of the good or service the firm sells

4. As discussed in class, when writing out a contract, is it possible to plan for every contingency?
a. No, because high production costs prevent firms from planning
b. Yes, because contracts can be long or short
c. No, because gathering that kind of information is too costly
d. Yes, because firms are typically very efficient at monitoring their contracts

5. As discussed in class, a transaction cost is:
a. an implicit cost associated with purchasing a good or service
b. an explicit cost associated with purchasing a good or service
c. a production cost incurred by firms who hire variable factors
d. the overall cost associated with purchasing a good or service
e. a cost associated with organizing and facilitating exchange

Questions #6-7 correspond with the following production function for a specific firm that uses capital and labor in the production of good X.

$Q = 100\sqrt{L}$ (where Q = output, L = labor)

6. Rounded to the nearest tenth, what is the average product of labor (APL) when L = 100
a. 10.0
b. 1,000.0
c. 0.1
d. 5.0
e. none of the above

7. Rounded to the nearest hundredth, what is the marginal product of labor (MPL) when L increases from 100 units to 101 units
a. 9.95
b. 10.00
c. 0.05
d. 4.99
e. none of the above

8. The table below shows the daily effect of a firm hiring varying amounts of labor to produce units of good X. Assume that each unit of labor is hired at a wage of $20, and that good X is sold at a price of $2 per unit.

Labor	**Output**
1	50
2	85
3	115
4	135
5	145
6	150

Based on the information provided above, how many units of labor should this firm hire?
a. 1 unit of labor
b. 2 units of labor
c. 3 units of labor
d. 4 units of labor
e. none of the above

9. The Law of Diminishing Returns states that as increasing amounts of a variable factor are combined with a fixed factor, then _____.
a. we observe diminishing returns when output will begin to decrease
b. we observe diminishing returns when the overall cost of producing output decreases
c. we observe diminishing returns when output increases by smaller and smaller amounts
d. all of the above

10. If MPL = 2.5 and APL = 3.0, then which of the following statements is true:
a. APL is increasing
b. MPL is increasing
c. APL is decreasing
d. APL is equal to MPL
e. MPL is at a maximum

11. As discussed in class, when comparing product and cost curves, which statement is correct:
a. when a product curve is rising, it's related cost curve is rising
b. product curves give us information about diminishing returns, cost curves do not
c. APL and MPL intersect where MPL is at a maximum, and average cost and marginal cost intersect where marginal cost is at a maximum
d. product curves are inverse mirror images of the cost curves

12. Which of the following statements about average fixed cost (AFC) is true:
a. AFC always increases as output increases
b. AFC always decreases as output increases
c. AFC is always less than average variable cost
d. AFC is always less than marginal cost

13. Which of the following is always a true statement:
a. AFC = TC - TVC
b. TFC = TR - TC (where TR = total revenue)
c. TVC = TC + TFC
d. AC = AFC + AVC

14. Which of the following industries is closest to perfect competition:
a. where there are many, small firms producing identical products
b. where there are only a few firms, producing identical products
c. where there are many firms, each of which can set its own price
d. where there are only a few firms all trying to set a lower price than their competitors

15. Which of the following characteristics implies that all perfectly competitive firms will sell their output at the same price?
a. firms are all small producers
b. firms are able to borrow all the money they need to purchase capital
c. there are many firms in the market
d. homogeneous products
e. firms have no barriers to entry or exit

16. What purpose do MC and AC serve when we study perfectly competitive firms?
a. MC determines the profit maximizing level of output, AC determines whether profits are positive or negative
b. MC determines whether profits are positive or negative, AC determines the profit maximizing level of output
c. MC and AC are used together to help us determine the level of output
d. MC tells us if the firm has any sunk costs, and AC tells us the level of output
e. MC tells us if the firm will shut down, AC tells us if the firm will produce

The equations below should be used with Questions #17-22 and correspond with a profit maximizing perfectly competitive firm (i.e. where q = output).

$TC = \$170$	if $q = 0$
$TC = 200 + 10q + q^2$	if $q > 0$
$MC = 10 + 2q$	if $q > 0$

17. If q = 100, then what is the firm's average cost (AC)?
a. $11,200
b. $112
c. $110
d. $2
e. none of the above

18. If q = 100, then what is the firm's average variable cost (AVC)?
a. $11,200
b. $112
c. $110
d. $2
e. none of the above

19. If q = 100, then what is the firm's average fixed cost (AFC)?
a. $11,200
b. $112
c. $110
d. $2
e. none of the above

20. What are the firm's sunk costs?
a. $200
b. $170
c. $30
d. $1.70
e. none of the above

21. What are the firm's recoverable fixed costs?
a. $200
b. $170
c. $30
d. $3
e. none of the above

22. What are the profits of this firm when the firm produces at the minimum point of AC?
a. - $1500
b. $0
c. $23.33
d. $1510
e. none of the above

23. Assume that a perfectly competitive firm currently faces a market price of $20, and that this price leads to the firm producing at the breakeven point. Assume also that the following is true:

- the firm has average variable cost of $10
- the firm has recoverable fixed cost of $750
- if the firm was closed, then the firm's profit would be -$250

How much output does this firm currently produce?
a. 100 units of output
b. 10 units of output
c. 500 units of output
d. 200 units of output
e. none of the above

24. Which statement about economic profit is true:
a. a firm will never produce when economic profit is less than zero
b. economic profit minus a firm's opportunity costs is equal to accounting profit
c. economic profit represents the overall amount of money a firm earns in a given period
d. economic profit is always less than accounting profit

25. What happens if a perfectly competitive firm earns a loss that, in terms of magnitude or absolute value, is larger than the firm's total fixed cost?
a. the firm will exit the industry in the short run
b. the firm will produce in the short run and earn negative profit
c. the firm will shut down in the short run and wait for the market price to rise
d. each firm will lower its price in the short run
e. all of the above

26. If the definition of a supply curve is that this is a curve which shows how much quantity will be supplied at each possible price, then the perfectly competitive firm's supply curve is _____.
a. the firm's average cost curve
b. the firm's marginal cost curve
c. a horizontal line at the market price
d. a vertical line at the firm's equilibrium quantity

27. Which of the following is true about a firm when the firm produces at the shut down point:
a. when producing, the firm earns economic profit that's equal to what the firm would lose if closed
b. when producing, the firm earns economic profit that's greater than what the firm would lose if closed
c. when producing, the firm earns economic profit that's less than what the firm would lose if closed
d. the firm earns zero economic profit

28. If a firm doubles in size (scale) but needs less than twice as many workers, then:
a. the firm experiences decreasing returns to scale
b. the firm experiences increasing costs
c. the firm experiences increasing returns to scale
d. the firm experiences constant returns to scale
e. none of the above

29. Assume that in a market where firms are all earning economic profit of zero, there is an increase in demand. After demand has increased, how will the market adjust over the long run?
a. the equilibrium price will increase and equilibrium (market) quantity will decrease
b. the equilibrium price will increase and equilibrium (market) quantity will increase
c. the equilibrium price will decrease and equilibrium (market) quantity will decrease
d. the equilibrium price will decrease and equilibrium (market) quantity will increase

30. What happens over the long run within a perfectly competitive market when a shift in market demand causes firms to suddenly experience P > AC?
a. market demand will increase
b. market demand will decrease
c. market supply will increase
d. market supply will decrease
e. both market demand and market supply will increase

*Questions #31-35 correspond with the table on the next page (**Table 1**).*
31. What is the sunk cost of this firm?
a. $10
b. $25
c. $200
d. $100
e. none of the above

32. Based on Table 1, what are the recoverable fixed costs of this firm?
a. $10
b. $25
c. $200
d. $100
e. none of the above

33. Based on Table 1, what is the greatest possible profit that this firm can earn when the firm produces 10 units (i.e. when q = 10)?
a. $100
b. $300
c. $400
d. $500
e. none of the above

34. Based on Table 1, what is the greatest possible profit that this firm can earn when the market price is set at $26 (i.e. when P = $26)
a. -$148
b. -$68
c. -$104
d. $172
e. none of the above

35. Based on Table 1, what is the greatest possible profit that this firm can earn when the market price is set at $42 (i.e. when P = $42)
a. $28
b. $336
c. -$266
d. -$100
e. none of the above

*Table 1 (below) should be **used to answer questions #31-35** on the previous page. The table corresponds with the output and costs of a profit maximizing, perfectly competitive firm.*

Table 1

Output	TC	MC	AC	AVC
0	$ 25.00	-	-	-
1	$ 112.00	$ 14.00	$ 112.00	$ 12.00
2	$ 128.00	$ 18.00	$ 64.00	$ 14.00
3	$ 148.00	$ 22.00	$ 49.33	$ 16.00
4	$ 172.00	$ 26.00	$ 43.00	$ 18.00
5	$ 200.00	$ 30.00	$ 40.00	$ 20.00
6	$ 232.00	$ 34.00	$ 38.67	$ 22.00
7	$ 268.00	$ 38.00	$ 38.29	$ 24.00
8	$ 308.00	$ 42.00	$ 38.50	$ 26.00
9	$ 352.00	$ 46.00	$ 39.11	$ 28.00
10	$ 400.00	$ 50.00	$ 40.00	$ 30.00
11	$ 452.00	$ 54.00	$ 41.09	$ 32.00
12	$ 508.00	$ 58.00	$ 42.33	$ 34.00
13	$ 568.00	$ 62.00	$ 43.69	$ 36.00
14	$ 632.00	$ 66.00	$ 45.14	$ 38.00
15	$ 700.00	$ 70.00	$ 46.67	$ 40.00
16	$ 772.00	$ 74.00	$ 48.25	$ 42.00
17	$ 848.00	$ 78.00	$ 49.88	$ 44.00
18	$ 928.00	$ 82.00	$ 51.56	$ 46.00
19	$ 1,012.00	$ 86.00	$ 53.26	$ 48.00
20	$ 1,100.00	$ 90.00	$ 55.00	$ 50.00

Note that:
TC = Total Cost
AC = Average Cost
MC = Marginal Cost
AVC = Average Variable Cost

Part 2. Short Answer Section (20 points overall)

Credit for these problems will come from not only showing you know the correct answer but also that you show any relevant work, or make it very clear as to how you got your answer. No supporting work and just an answer will get no credit, whether the actual answer is correct or not.

Assume the equations below correspond with a profit maximizing, perfectly competitive firm. Use these equations to answer questions #1-4. Note that question #5 uses table 1 on the previous page.

$TC = \$350$	if $q = 0$
$TC = 500 + 10q + 4q^2$	if $q > 0$
$MC = 10 + 8q$	if $q > 0$

[5 pts] 1. If the firm is currently producing 20 units of output, then what are the firm's greatest possible profits?

[5 pts] 2. Assume all you know is that this profit maximizing firm has an average variable cost of \$50. Based on what you know about a firm like this, in terms of how the firm behaves, what must be the firm's current profit?

[5 pts] 3. If the market price is currently \$106 (i.e. P = 106), then what would be the firm's greatest possible profits?

Part 2. Short Answer Section cont.

*Grading on #4 will consider how accurately you answer the question, but also (given the information provided) how well you demonstrate a **complete** understanding of the concept being addressed within this question.*

[10 pts.] 4. Assume we have profit maximizing firms who produce used cars in a perfectly competitive market, where we'll assume used cars are a normal good. Assume that the firms in this market currently face a price that is equal to both marginal cost and average cost.

Discuss/show how this market would adapt over the long run to recession, which represents a significant decrease in consumer income.

Part II. Short Answer Questions cont.

Grading on #5 will consider how accurately you answer the question, but the grading will focus on how well you demonstrate an understanding of diminishing marginal returns, as well as the profit maximizing process for perfectly competitive firms.

[5 pts.] 5. Will a profit maximizing (perfectly competitive) firm ever produce at a point where the firm experiences diminishing returns? Explain.

Equations:
Below are equations you may use to calculate different values within this exam.

$$\text{APL} = \frac{Q}{L}$$

$$\text{MPL} = \frac{\Delta Q}{\Delta L}$$

$$\text{AC} = \frac{TC}{Q}$$

$$\text{AVC} = \frac{TVC}{Q}$$

$$\text{AFC} = \frac{TFC}{Q}$$

$$\text{TC} = \text{TVC} + \text{TFC}$$

$$\text{TFC} = \text{Sunk Cost} + \text{RFC}$$

$$\pi = (\text{P} \times \text{Q}) - \text{TC}$$

All variables in the equations above are the same as what we used in class. E.g., within the exam, you'll find that Q = output of a firm.