Final Exam

You have until 5:30pm to complete this exam. Be certain to put your name, ID number and section on both the exam and your scantron sheet and fill in test form A on the scantron. Answer all multiple choice questions on your scantron sheet. Choose the single best answer for each question; if you fill in multiple answers for a question you will be marked wrong. Answer the long answer questions directly on the exam. You must show your work where relevant for full credit. Good luck!

Name: **ID Number:**   **Section:**

SECTION I: MULTIPLE CHOICE (60 points)

1. Suppose that a firm in a competitive industry is currently producing at a quantity where price equals marginal cost and the marginal cost curve has a negative slope. Which of the following is definitely true?

   (a) The firm is maximizing profits.
   (b) The firm could increase profits by shutting down.
   (c) The firm could increase profits by increasing output.
   (d) None of the above.

2. Suppose that a consumer is currently at a bundle that is not on her budget line. We can say for certain that she is not maximizing utility if:

   (a) The marginal utilities of both goods are negative.
   (b) The marginal utilities of both goods are positive.
   (c) Both (a) and (b).
   (d) Neither (a) nor (b).

3. On a graph with capital on the horizontal axis and output on the vertical axis, which of the following would make the isoprofit lines steeper?

   (a) An increase in the wage.
   (b) An increase in the price of output.
   (c) An increase in the rental rate of capital.
   (d) None of the above.

4. The demand curve for pineapples is downward sloping and the supply curve for pineapples is upward sloping. A $2 quantity tax placed on consumers will:

   (a) Generate the same deadweight loss as a $2 quantity tax placed on producers.
   (b) Generate the same tax revenue as a $2 quantity tax placed on producers.
   (c) Both (a) and (b) are true.
   (d) Neither (a) nor (b) is definitely true.

5. Suppose that the marginal utility of bananas is positive and increasing. Adam is currently consuming ten bananas and the price of a banana is 50 cents. The next dollar Adam spends on bananas will:

   (a) Increase Adam's utility by the same amount as the previous dollar he spent on bananas.
   (b) Increase Adam's utility but by less than the previous dollar he spent on bananas.
   (c) Increase Adam's utility by more than the previous dollar he spent on bananas.
   (d) Decrease Adam's utility.

6. A firm uses inputs A and B to produce output. Neither input is fixed. The firm is currently using a combination of A and B at which the current isoquant is steeper than the current isocost line on a graph with A on the horizontal axis and B on the vertical axis. The firm could increase output while keeping costs the same by:

   (a) Moving down and right along the isoquant.
   (b) Moving up and left along the isoquant.
   (c) Moving down and right along the isocost line.
   (d) Moving up and left along the isocost line.

7. There are two consumers for DVDs, Betsy and Calvin. Both have downward sloping demand curves. Betsy stops buying DVDs when the price gets above \$10. Calvin stops buying DVDs with the price gets above \$8. Which of the following is definitely true?

   (a) The demand curve will have a kink at \$8 and be flatter to the left of the kink than to the right of the kink.
   (b) The demand curve will have a vertical intercept at \$10.
   (c) The demand curve will be upward sloping.
   (d) None of the above.

8. If a firm has no fixed costs we can say for certain that:

   (a) The firm's marginal cost curve will be a horizontal line.
   (b) The firm's shutdown price will be the same as its breakeven price.
   (c) The firm will produce at all positive prices.
   (d) The firm's marginal cost curve will be above its average cost curve.

9. A firm's only input is labor. If the firm's production function exhibits increasing returns to scale:

   (a) The marginal product of labor must be decreasing.
   (b) The marginal product of labor must be increasing.
   (c) The marginal product of labor must be constant.
   (d) None of the above.

10. If Donald has upward sloping indifference curves:

    (a) His preferences are not monotonic.
    (b) His preferences are not transitive.
    (c) He is not maximizing his utility.
    (d) He will not spend his entire income if he is maximizing utility.

11. A firm should shut down in the short run if:

    (a) Variable costs are greater than fixed costs.
    (b) Variable costs are greater than total revenue.
    (c) Total costs are greater than fixed costs.
    (d) Fixed costs are greater than total revenue.

12. If gasoline is an ordinary good, we can say for certain that:

    (a) The demand curve for gasoline will be downward sloping.
    (b) The Engel curve for gasoline will be upward sloping.
    (c) Both (a) and (b).
    (d) Neither (a) nor (b).

13. If the income elasticity of demand for bread is positive, we could conclude that:

    (a) Bread is an inferior good.
    (b) Bread is a Giffen good.
    (c) Bread is a normal good.
    (d) Not enough information.

14. Suppose that in the short run, some of a restaurant's ingredients are fixed inputs. Other ingredients and the kitchen staff are variable inputs. The costs of producing one hundred meals in the short run will definitely be:

    (a) Less than the costs of producing one hundred meals in the long run.
    (b) Greater than the costs of producing one hundred meals in the long run.
    (c) Less than the costs of producing two hundred meals in the long run.
    (d) None of the above are definitely true.

15. If pancakes and waffles are perfect substitutes, the marginal rate of substitution of pancakes for waffles will be:

    (a) Diminishing.
    (b) Increasing.
    (c) Constant.
    (d) Not enough information.

16. If capital is the only variable input in the short run, a profit-maximizing firm will choose the level of capital at which:

    (a) The price of output is equal to the price of a unit of capital.
    (b) The price of a unit of capital is equal to the marginal product of a unit of capital.
    (c) The price of a unit of capital is equal to the revenue generated by the last unit of capital.
    (d) The price of a unit of output is equal to the revenue generated by the last unit of capital.

17. We would expect the price elasticity of demand for a necessity like medicine to be:

    (a) Larger in magnitude than the price elasticity of demand for a good with many close substitutes.
    (b) Smaller in magnitude than the price elasticity of demand for a good with many close substitutes.
    (c) Large and positive.
    (d) Perfectly elastic.

18. A competitive firm is currently producing at a positive quantity where marginal cost is below average cost. Assuming the firm is behaving optimally, which of the following must be true?

    (a) The firm is earning positive profits.
    (b) The firm has no fixed costs.
    (c) The firm's average cost curve is downward sloping at the current quantity.
    (d) The firm's average variable cost curve is downward sloping at the current quantity.

19. Suppose that a firm's only two inputs are capital and labor. If the firm uses ten units of capital and no labor, it can produce 100 units of output. It can also produce 100 units of output using no capital and ten units of labor. If the firm can only produce 80 units of output when using five units of capital and five units of labor:

    (a) The firm's production technology exhibits decreasing returns to scale.
    (b) The firm's production technology exhibits increasing returns to scale.
    (c) The firm's production technology is not monotonic.
    (d) The firm's production technology is not convex.

20. Which of the following would definitely not shift a consumer's demand curve for asparagus?

    (a) A change in preferences.
    (b) A change in income.
    (c) A change in price of asparagus.
    (d) A change in the price of lemons.

SECTION II: SHORT ANSWER (40 points)

1. (15 points) The only costs for a clothing manufacturer are what it spends on fabric and workers. For every shirt the clothing manufacturer wants to make, it must use two units of fabric and one worker. So if it wanted to make ten shirts it would need to use twenty units of fabric and ten workers. The price of a unit of fabric is $5 and the price of a worker is $10.

   (a) Write down a production function for the manufacturer that gives the number of shirts produced (S) as a function of the amount of fabric (F) and number of workers (W) used.
   (b) Write down a function that gives costs as a function of the number of shirts produced. Assume that the manufacturer chooses its inputs to minimize total costs.
   (c) Suppose that the clothing industry is competitive. What will the market price of a shirt be in the long run?

2. (15 points) A firm can use two different factories to produce output, factory A and factory B. The cost functions for each factory in terms of the output produced at the factory are:

$$C_A(y_A) = 10y_A^2 \tag{1}$$

$$C_B(y_B) = 20y_B^2 \tag{2}$$

(a) Suppose that the firm wants to produce 90 units of output. How much output would the firm produce at factory A and how much output would it produce at factory B if it wanted to minimize total costs?

(b) Derive a cost function for the firm that gives costs as a function of total output ($C(y)$). Assume that the firm minimizes costs.

(c) Suppose that the firm renovates factory A and as a result, the new cost function for factory A is:

$$C_A(y_A) = 10y_A^{\frac{1}{2}} \tag{3}$$

The cost function for factory B has not changed. Given this new cost function for factory A, find the firm's new total cost function ($C(y)$) for producing any quantity greater than or equal to one (still assuming that the firm minimizes costs).

3. (10 points) Suppose that the market for cigarettes is competitive and firms can freely enter and exit in the long run. The state government decides to impose a \$2 per pack tax on cigarettes. On a graph with packs of cigarettes on the horizontal axis and the price of a pack of cigarettes on the vertical axis, show the effect this cigarette tax will have on consumer surplus in the long run. Assume that the demand curve is linear and downward sloping. Also assume that before the tax is put in place, the cigarette market was in a long run equilibrium with a market price of \$5 a pack and a total quantity of 1000 packs sold. Be certain to show all of the following on your graph:

- The demand curve.
- The long run supply curve (you do not need to show any short run supply curves).
- The pre-tax equilibrium.
- The long run equilibrium after the tax, labelling price and quantity with exact numbers if possible.
- The change in consumer surplus.