DO NOT BEGIN WORKING UNTIL YOU ARE TOLD TO DO SO. READ THESE INSTRUCTIONS FIRST.

You have 75 minutes to complete the exam, which consists of 30 multiple-choice questions. Each question is worth the same number of points, so manage your time wisely. Please answer the questions on your scantron sheet with a #2 pencil. Be sure to fill in the scantron sheet carefully and accurately.

How to fill in the scantron sheet:
1. Fill in the bubbles on your sheet with your last name, first name, and middle initial.
2. Fill in the bubbles so we know your student identification number.
3. Fill in the bubbles under "Special Codes" spaces ABC so we know the discussion section number for which you are officially registered. Discussion sections are listed below:
4. Finally, after filling in your section code, please put the exam version in the “Special Codes” spaces. You will end up with a 4-digit “Special Codes” number – a three digit section number followed by a one digit exam version number.

<table>
<thead>
<tr>
<th>Jonathan Hore</th>
<th>John Morrow</th>
<th>Dan Wei</th>
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</thead>
<tbody>
<tr>
<td>371 R 8:50</td>
<td>357 F 11:00</td>
<td>358 F 12:05</td>
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<td>372 R 12:05</td>
<td>359 F 12:05</td>
<td>363 F 2:25</td>
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<td>361 W 9:55</td>
<td>365 F 3:30</td>
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<td>362 F 2:25</td>
<td>366 M 8:50</td>
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<table>
<thead>
<tr>
<th>Greg Whitten</th>
<th>Jason Wu</th>
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<td>356 F 11:00</td>
<td>360 W 9:55</td>
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<td>364 F 3:30</td>
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<td>367 M 8:50</td>
<td>370 M 12:05</td>
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<tr>
<td>368 M 11:00</td>
<td>373 W 8:50</td>
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</tbody>
</table>

If you have a question during the exam, stay seated and please raise your hand. All scantron sheets must be turned in as you leave the exam. If you finish early and want to leave, please bring your scantron to the front of the room as quietly as possible.

The exam will be discussed in section next week. You should record your answers on your copy of the exam so you can self-grade after the key is posted.

Relax. Stop, take a deep breath, and think carefully before you answer any questions. Good luck!
Answer these multiple choice questions on the scantron sheet, selecting the *best* answer.

Use the table below to answer the next four questions:

<table>
<thead>
<tr>
<th>Jonathan’s Carpet Cleaning Company</th>
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<tbody>
<tr>
<td>Carpets</td>
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<tr>
<td>---------</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>1</td>
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<td>3</td>
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<td>4</td>
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<tr>
<td>5</td>
</tr>
</tbody>
</table>

1. What is the marginal cost of cleaning the third carpet:
   A) 10
   B) 20
   C) 30
   D) 40
   E) None of the above

2. What is Average Variable Cost when 5 carpets are cleaned?
   A) 50
   B) 100
   C) 200
   D) 250
   E) None of the above.

3. Assume Jonathan’s Carpet Cleaning Company operates in a perfectly competitive market. Jonathan is a profit maximizer. If the short-run equilibrium price is $80, how many carpets will he clean?
   A) 5
   B) 4
   C) 3
   D) 2
   E) None, he will shut down.

4. Assume Jonathan’s Carpet Cleaning Company operates in a perfectly competitive market. Jonathan is a profit maximizer. If the short-run equilibrium price is $30, how many carpets will he clean?
   A) 5
   B) 4
   C) 3
   D) 2
E) None, he should shut down.
Use the following diagram to answer the next question:

5. When market price is $P_5$, a profit maximizing firm's profits can be represented by the area
   A) $(P_5 - P_4)Q_3$
   B) $P_5Q_3$.
   C) $P_3Q_2$.
   D) $(P_5 - P_3)Q_2$.
   E) When the market price is $P_5$ there are no profits.

6. The market for rutabagas is perfectly competitive, with 1,000 rutabaga farms. An increase in the price of fertilizer used for growing rutabagas will
   A) have no effect on the total quantity of rutabagas supplied, because no farm has enough market power to raise the price.
   B) decrease the total quantity of rutabagas supplied, because each farm’s supply curve shifts leftward.
   C) have no effect on the total quantity of rutabagas supplied, because each farm’s supply curve is a vertical line.
   D) decrease the total quantity of rutabagas supplied, because each farm’s supply curve is a horizontal line and will shift upward.
   E) None of the above.

7. Say Greg consumes only chocolate and magazines. Which of the following will lead to a change in the shape of his indifference curves?
   A) a change in his preferences for either of the two goods.
   B) a change in the price of either of the two goods.
   C) a change in his income.
   D) both B and C are true.
   E) A, B and C are true.
8. Where marginal cost is less than average cost,
   A) Average cost is at it’s minimum value.
   B) Marginal cost must be falling.
   C) Marginal cost must be rising.
   D) **Marginal cost may be rising, falling, or constant.**
   E). Average cost may be rising, falling, or constant.

Use the following graph to answer the next two problems:

![Graph showing total cost (TC) and total revenue (TR) curves.]

9. Given the total cost and total revenue curves in the above figure, what are the output levels at which the firm will earn economic profits?
   A) Between 0 to 30,000 bushels.
   B) Between 30,000 to 60,000 bushels.
   C) Between 60,000 and 80,000 bushels.
   D) Over 80,000 bushels
   E) **Both B) and C).**

10. Given the total cost and total revenue curves in the figure above, what is the profit-maximizing output level?
    A) 0 bushels
    B) 30,000 bushels
    C) **60,000 bushels**
    D) 80,000 bushels
    E) All output levels occur between 30,000 and 80,000 bushels are profit-maximizing.
11. If the above lines are indifference curves and if compact discs and haircuts are perfect substitutes, then points B, C, D in the diagram
   A) Have the same marginal rate of substitution.
   B) Are all preferred to by the consumer compared to point A.
   C) Are all equally preferred by the consumer.
   D) None of A, B or C are true.
   E) All of A, B and C are true.

12. If the above lines are budgets constraints, and the consumer tells you that she can afford point D, then
   A) She cannot afford A.
   B) She can also afford E and C.
   C) The price of compact discs is higher at D compared to B.
   D) The price of haircuts is higher at D compared to B.
   D) None of the above.

13. If the above lines are budget constraints and the optimal consumption for a consumer changes from F to A in one year, and then A to C in the next year. Which of the following is false?
   A) Her income is increasing over the two years.
   B) Both compact discs and haircuts are normal goods.
   C) Her utility is increasing over the two years.
   D) A decrease in the price of haircuts induced her to change her optimal consumption.
E) She prefers point C to point F.

14. Ratul consumes either Ramen (an inferior good) or Oreo’s (a normal good). Ratul has an income of $10/day. Due to his diligence at work, his employer decides to give him a raise of $5/day. Assume the prices of Ramen and Oreo remains the same. Which of the following MUST be true?
   A) Ratul’s budget constraint will remain the same after the raise as before the raise
   B) Ratul’s consumption of Ramen will increase
   C) Ratul’s budget constraint after the raise will cross his budget constraint before the raise.
   D) Ratul will no longer consume any Ramen.
   E) Ratul’s budget constraint will shift parallel outwards.

15. Say John consumes only Brats and Cheese. Cheese is an inferior good, while Brats are a normal good. Suppose that the price of Cheese falls. Which of the following will increase the quantity of Cheese purchased?
   A) The Income Effect of the price change.
   B) The Substitution Effect of the price change.
   C) Both the Income and Substitution Effects.
   D) None of the above.
   E) Not enough information.

16. A factory produces 1,000 radios a year, AVC = $10 and TFC = $5,000. The factory’s TC
   A) Equals $15.
   B) Equals $5,010.
   C) Equals $6,000.
   D) Equals $15,000.
   E) Equals $5,000,000.

17. A microcomputer manufacturer sells 1,000 units per month at $2,500 each. A price cut to $2,000 is being considered. His marginal cost is constant at $1,500 per unit. To maintain profits, quantity sold must increase to at least
   A) 1,250
   B) 1,500
   C) 2,000
   D) 2,500
   E) 3,000

18. Suppose leisure is a normal good. When the hourly wage rises, all else equal, this leads to
   A) increased leisure if the substitution effect dominates the income effect.
   B) decreased leisure if the income effect dominates the substitution effect.
   C) decreased labor supply if the substitution effect dominates the income effect.
   D) decreased labor supply if the income effect dominates the substitution effect.
19. In the figure above, Good X is on the horizontal axis and Good Y is on the vertical axis. The figure illustrates a change in consumption coming from a drop in the price of good Y. The _____ effect decreased consumption of Good X and the _____ effect increased the consumption of Good X. The _____ effect was larger on Good X.
   A) income, substitution, substitution
   B) substitution, income, income
   C) income, substitution, income
   D) substitution, income, substitution
   E) None of the above

20. From the above figure, we know that good X is a(n) _______ good, while goods X and Y are ________.
   A) Inferior, Complements
   B) Inferior, Substitutes
   C) Normal, Complements
   D) Normal, Substitutes
   E) None of the above.

21. Jim receives a wage of $80 per hour; Bob receives a wage of $10 per hour. To maximize utility, Jim works 35 hours per week and Bob works 42 hours per week. The opportunity cost of an additional hour of leisure is:
   A) higher for Jim than Bob.
   B) higher for Bob than Jim.
   C) not enough information is given.
   D) less than $80 for Jim.
   E) greater than $10 for Bob.
Utility information for Jason

<table>
<thead>
<tr>
<th>South Park Episodes</th>
<th>Family Guy Episodes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q</td>
<td>Total Utility</td>
</tr>
<tr>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>200</td>
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<td>3</td>
<td>300</td>
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<td>400</td>
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<td>500</td>
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</table>

22. Using the above information on Jason’s utility, we can infer that
   A) South Park and Family Guy are perfect complements.
   B) South Park and Family Guy are perfect substitutes.
   C) Family Guy is a normal good for Jason.
   D) Family Guy is an inferior good for Jason
   E) None of the above are true.

<table>
<thead>
<tr>
<th>Q of Pizza (slices)</th>
<th>MU of Pizza</th>
<th>Q of Beer (Bottles)</th>
<th>MU of Beer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100</td>
<td>1</td>
<td>200</td>
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<td>2</td>
<td>80</td>
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23. Fred consumes only Pizza and Beer. The table above shows the relationship between his consumption and marginal utility of Pizza and Beer. If Fred tells you that he maximizes his utility by consuming 3 Pizzas and 3 Beers, the price ratio between Pizzas and Beers must be
   A) 3/10
   B) 7/10
   C) 9/10
   D) 11/10
   E) 13/10

24. At a given level of production and employment, the marginal product of labor (MPL) is known to exceed the average product of labor (APL). Hence,
   A) MPL must be rising.
   B) A line from the origin to the production point on the Total Product curve is steeper than is the tangent line at the production point.
   C) MPL must be falling.
   D) The firm should use more capital to equalize marginal products.
25. Assume Dan consumes only Milk and Cookies. The price of a gallon of milk is half the price of a box of cookies. At her optimal consumption bundle it must be true that:
   A) Her marginal utility of cookies must be half her marginal utility of milk.
   B) Her marginal utility of cookies must be twice her marginal utility of milk.
   C) Her marginal utility of milk must be half her marginal utility of cookies.
   **D) Both B) and C) are true.**
   E) None of the above are true.

Use the figure below to answer the next two problems:

26. In the above figure, Goods are on the Y axis and leisure is on the X axis. Assume leisure is a normal good. In response to an increase in the wage rate, Bob moves from Point A to Point B. For this movement, his substitution effect:
   A) is smaller than his income effect.
   **B) is larger than his income effect.**
   C) works in the same direction as his income effect.
   D) Both answers A and C are correct.
   E) Both answers B and C are correct.

27. Now suppose the wage rate increases further, so that Bob’s new optimal consumption bundle is point C. Between the wage that gave us BL2 and the wage that gave us BL3, we know that Bob’s labor supply curve is:
   A) Upward sloping.
   **B) Downward sloping.**
   C) Horizontal.
   D) Vertical.
   E) None of the above.
28. Suppose leisure is an inferior good for Jason. Suppose his wage rate falls. Then,
   A) he will work more because the income effect is bigger than the substitution effect.
   B) he will work more because the substitution effect is bigger than the income effect.
   C) he will not work more or less, because the substitution effect and income effect
      exactly offset each other.
   **D) he will work less, because both the income and substitution effects cause him to
      choose more leisure.**
   E) none of the above are true.

29. Jonathan is thinking about expanding his Carpet Cleaning business. After detailed study of
    his costs, he can clean 42 carpets a week working half time with his current carpet cleaning
    machinery and shampoo. If he doubles his labor, his carpet cleaning machinery, and his
    shampoo, he can clean 55 carpets a week. Over this range of output, Jonathan has
    A) Increasing Returns to Scale.
    B) **Decreasing Returns to Scale.**
    C) Constant Returns to Scale.
    D) Varying Returns to Scale.
    E) Increasing Marginal Productivity of Labor.

30. A profit maximizing firm has technology Y = K + L. This technology exhibits
    A) Increasing Returns to Scale
    B) Variable Returns to Scale
    C) Marginal Returns to Scale
    **D) Constant Returns to Scale**
    E) Decreasing Returns to Scale