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 33 multiple-choice questions. The exam is worth 100 points. Each question is worth 3 points: you get 1 point for filling in the requested information correctly. Please answer the questions on your coding sheet with a #2 pencil. Be sure to fill in the coding sheet carefully and accurately. Please also turn in your exam with name, ID, and student number.

Name____________________                  ID _________________        Student number _____________

How to fill in the coding sheet:
1. Fill in the bubbles on your answer 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 number.

Georgy Loginov    William Nicholson    Jiao Shi    Fumihiko Suga
305 F 1:20         307 W 4:35         302 F 2:25         301 W 3:30
306 W 4:35         314 F 11:00        316 F 12:05        304 F 8:50
309 W 3:30         318 F 8:50         311 F 11:00        312 F 9:55
313 F 9:55

Carly Urban    Matthew Friedman    Irina Merkurieva    Michael Pistone
310 F 2:25         331 W 3:30         335 F 1:20         337 F 2:25
315 F 12:05        332 W 4:35         341 F 9:55         338 F 12:05
317 F 8:50         347 F 8:50         343 F 11:00        
319 F 1:20

Evangelos Stravelas    Yuan Yuan
330 W 3:30         336 F 11:00
333 W 4:35         339 F 12:05
334 F 1:20         340 F 9:55
342 F 2:25         346 F 8:50

If you have a question during the exam, stay seated and please raise your hand. To show respect to your fellow students, please stay seated in your exam seat for the full 75 minutes. All exams and answer sheets must be turned in as you leave the exam.

The exam will be discussed in section next week.

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.

1) 100 students are in Michael’s discussion section. Each has a soft drink demand given by \( P = 20 - 2Q \). What is the market demand for students in Michael’s section?

   a) \( 100P = 2000 - 200Q \)
   b) \( Q = 10 - 5P \)
   c) \( P = 20 - 200Q \)
   d) \( P = 2000 - 2Q \)
   e) \( P = 20 - (1/50)Q \)

Jonathan’s Carpet Cleaning Company

<table>
<thead>
<tr>
<th>Carpets</th>
<th>TVC</th>
<th>TFC</th>
<th>TC</th>
<th>AVC</th>
<th>AFC</th>
<th>ATC</th>
<th>MC</th>
</tr>
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<tbody>
<tr>
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<td></td>
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<tr>
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<td>85</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>10</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2) Refer to the above table. Jonathan is producing in a perfectly competitive carpet cleaning market and the price of the output is $30 per carpet. To maximize profit in the short run, setting \( P = MC \), how many carpets should Jonathan clean?

   a) None, he should shut down.
   b) 2
   c) 3
   d) 4
   e) 5

3) Refer again to the Table. If the market price for carpets falls to $15, to maximize profits in the short run how many carpets should Jonathan clean?

   a) None, he should shut down.
   b) 2
   c) 3
   d) 4
   e) 5

4) Libby consumes two goods, fast food meals and books, and like all of us, faces a budget constraint. The fast food meals she eats cost $5 per meal. The books she buys cost $8 per book. Her marginal utility from her last fast food meal was 55. Her marginal utility from the last book she read was 64 (she’s a voracious reader and eater, so her utility does not depend on the quality of the books or meals). Libby…

   a) is behaving optimally.
   b) should consume more books and fewer meals.
   c) could be behaving optimally or suboptimally. We cannot answer the question without information on prices.
   d) should consume more meals and fewer books.
c) should buy and read more books, holding meal consumption constant.

Use the following information to answer the next two questions: Consider a perfectly competitive market in the Short Run. Assume that Market Demand is \( P=48-3Q_d \) and Market Supply is \( P=Q_s \). Denoting firm level quantity by \( q \), assume \( TC=2+4q+2q^2 \) so that \( MC=4+4q \).

5) Does the firm make a profit or loss in the short run, and how much are these profits/losses.
   
   a) Loss, $6.
   b) Profit, $6.
   c) Loss, $194.
   d) Profit, $194.
   e) It is impossible to tell from the information given.

6) In the Long Run, there will be _____ into/from the industry and the Long Run equilibrium price will be:

   a) Entry, $12.
   b) Exit, $12.
   c) Entry, $8.
   d) Exit, $8.
   e) No entry or exit, $12.

7) Melissa has a utility function \( U = X^2 + 2Y \) which implies \( MRS = \frac{1}{4\sqrt{X}} \). If the price of X is 1, the price of Y is 16, and her income is $160, what is Melissa’s optimal consumption of X and Y?

   a) \( X=160, Y=0 \)
   b) \( Y=0, Y=10 \)
   c) \( X=16, Y=9 \)
   d) \( X=80, Y=5 \)
   e) Not enough information is given.
8) (Figure: Indifference Curves and Consumption Bundles) In the figure above, the initial optimum is at $a$. The price of hot dogs now increases, and the new equilibrium point is $c$. The change in hot dog consumption due to the income effect of the price change is:
   a) $H_3$ to $H_2$.
   b) $H_2$ to $H_3$.
   c) $H_1$ to $H_3$.
   d) $H_1$ to $H_2$.
   e) $H_2$ to $H_1$.

9) (Figure: Indifference Curves and Consumption Bundles) In the figure above, the initial optimum is at $a$. The price of hot dogs now increases. The change in hot dog consumption due to the substitution effect is:
   a) $H_3$ to $H_2$.
   b) $H_2$ to $H_3$.
   c) $H_3$ to $H_1$.
   d) $H_1$ to $H_3$.
   e) $H_2$ to $H_3$. 
10) Consider the following graph representing the cost structure of a firm. Which of the following statements is correct (note, AC in the figure is what we typically label “ATC")?

![Graph of cost structure with price p, quantity q, marginal cost MC, average cost AC, and average variable cost AVC]

- a) At the price p* the firm has a loss.
- b) At the price p* the firm has a loss but lower than its fixed costs.
- c) At p* the firm will offer a quantity corresponding to the point where the price is equal to the average costs.
- d) The firm won’t participate in the market with a price like p*.
- e) In the long run, other firms will try to enter this market.

11) After a great deal of soul-searching, Jonathan has realized that he wishes to devote his life to cleaning carpets. Consequently, he is thinking about expanding his business. After detailed study of his costs, he can clean 27 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 60 carpets a week. Over this range of output, Jonathan has

- a) Bathroom scales.
- b) Diseconomies of scale.
- c) Constant returns to scale.
- d) Diminishing marginal product of labor.
- e) Economies of scale.
Figure: Production Costs of Dog Sweaters

<table>
<thead>
<tr>
<th>Quantity of Sweaters</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>300</td>
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<tr>
<td>5</td>
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<td>25</td>
<td>1500</td>
</tr>
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<td>30</td>
<td>1920</td>
</tr>
</tbody>
</table>

12) Maxine produces designer dog sweaters and sells them at her store, “Abercrombie & Fetch.” Assume that the doggie sweater industry is perfectly competitive and that there are no costs associated with entry or exit. What is Maxine’s shut-down price?

   a) $36  
   b) $38  
   c) $40  
   d) $58  
   e) None of the above.

13) Using the cost information given above what is Maxine’s marginal cost for producing the 20th doggie sweater (i.e., moving from the 15th to the 20th sweater)?

   a) $13  
   b) $43  
   c) $52  
   d) $58  
   e) $68

14) The price of Pepsi falls by 20 percent and the quantity consumed of Coke falls by 10 percent. The cross price elasticity of demand for Coke (with respect to the price of Pepsi) is

   a) 0.5 and Coke and Pepsi are substitutes  
   b) -2 and Coke and Pepsi are substitutes  
   c) 2 and Coke and Pepsi are complements  
   d) -0.5 and Coke and Pepsi are substitutes  
   e) None of the above
15) The Madison pizza market is perfectly competitive. In a given week (when school is in session), 80000 pizzas are sold. The perfectly competitive price is $12 per pizza. All firms have the same marginal costs, which equal MC = 4 + q/100. How many firms are there in the market?

a) 80  
b) 100  
c) 120  
d) 200  
e) 240

16) Assume that the consumer depicted in the figure below has an income of $100 and currently optimizes at point A. When the price of marshmallows decreases to $5, the optimizing consumer will choose to purchase how many units of marshmallows?

a) 3  
b) 10  
c) 9  
d) 4  
e) 6

![Graph of indifference curves showing consumption choices](image)
17) The following graph shows Joe’s preferences for bread and butter. Given his income and the initial prices he optimally chooses to consume at point A. Suppose that the price of butter increases, it follows that the new optimal consumption of bread must

- a) increase.
- b) decrease.
- c) stay the same.
- d) Anything may happen.
- e) Consumption will go to zero

18) Danny likes to eat apples and bananas. In fact, Danny spends all of his money buying (and eating!) only apples and bananas. In addition, Danny is a rational consumer, and makes all of his decisions to maximize his own utility. Suppose that when the price of apples is $1 and the price of bananas is $3, Danny buys 12 apples and no bananas. However, when the price of apples increases to $2 (and the price of bananas is still $3), Danny is indifferent between spending money on apples only or on bananas only. Now, suppose the prices of apples and bananas both increase to $3 and $4, respectively. How many apples will Danny buy?

- a) 0
- b) 3
- c) 4
- d) 12
- e) not enough information to answer the question
19) Jamie makes cookies. She has decided to go into business selling her soon-to-be famous chocolate chip cookies at football games. Her total revenue from cookie sales is $TR=60Q$. Jamie’s marginal costs are $MC=4Q$. The profit-maximizing level of output is

a) 5  
b) 10  
c) 12  
d) 15  
e) 20

Table: Marginal and Total Benefit

<table>
<thead>
<tr>
<th>Number of games</th>
<th>Total benefit in dollars</th>
</tr>
</thead>
<tbody>
<tr>
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<td>0</td>
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<td>164</td>
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<tr>
<td>8</td>
<td>162</td>
</tr>
</tbody>
</table>

20) (Table: Marginal and Total Benefit) Rodger is deciding how many football games he wants to attend this year. The total benefit that Rodger receives from football games is shown in the accompanying table. If tickets to each football game cost $10, then he should attend ______ game(s).

a) 6  
b) 1  
c) 2  
d) 3  
e) 5

21) Kaile Cakes is currently producing 10 cakes per day. The marginal cost of the 10th cake is $24, and average total cost of 10 cakes is $6. The average total cost of 9 cakes is:

a) $4.  
b) $5.  
c) $6.  
d) $8.  
e) Not enough information is given.
22) In the accompanying figure, at the profit-maximizing quantity of output, total revenue is $______, total cost is $______, and profit is $______.
   a) 90; 72; -18
   b) 56; 56; 0
   c) 30; 48; -18
   d) 48; 56; -8
   e) 30; 30; 0

23) Jane spends all her income on goods X and Y and is purchasing the optimal consumption bundle. If the \( \frac{MU_x}{MU_y} = 3 \) and the price of X is equal to $12, then the price of Y is equal to:
   a) $36.
   b) $4.
   c) $12.
   d) $3.
   e) $24.

24) A wheat farmer operating in the short run produces 100 bushels of wheat. Her average total cost per bushel is $1.75, total revenue is $450, and (total) fixed costs are equal to $100. Then:
   a) average fixed cost is equal to $1.50.
   b) profit per bushel is equal to $2.75.
   c) average variable cost is equal to $1.25.
   d) profit is equal to $250.
   e) Not enough information is given.
25) (Figure: Good X and Good Y) Which chart in the accompanying figure shows the effects of an increase in the price of X, when good X and good Y are (imperfect) substitutes?
   a) A  
   b) B  
   c) C  
   d) D  
   e) None of the pictures capture the situation that is described.

26) (Figure: Good X and Good Y) Which chart in the accompanying figure shows the effect of a decrease in income when both good X and good Y are normal goods?
   a) A  
   b) B  
   c) C  
   d) D  
   e) None of the pictures capture the situation that is described.

27) Consider the demand curve Q = 16 - 2P. The demand elasticity when P goes from 3 to 5 is
   a) Not enough information is provided  
   b) Elastic  
   c) Inelastic  
   d) Bigger in the short run than the long run  
   e) One.
28) Which of the following is NOT true?
   a) Average fixed cost (AFC) is decreasing in Quantity at any time.
   b) Short run average total cost (ATC) cannot be lower than long run average total cost (ATC) at any Quantity.
   c) At the minimum-cost output, marginal cost (MC) is exactly equal to average total cost (ATC).
   d) Whenever marginal cost (MC) is greater than average variable cost (AVC), the average variable cost (AVC) is upward-sloping.
   e) If marginal cost (MC) is upward-sloping, then the average total cost (ATC) is also upward-sloping.

29) A perfectly competitive firm operating in the short run producing 100 units of output has \( ATC = 6 \) and \( AFC = 2. \) The market price is \( 3 \) and is equal to \( MC. \) In order to maximize profits (or minimize losses), this firm should:
   a) increase output.
   b) reduce output, but continue to produce a positive amount of output.
   c) shut down.
   d) do nothing; the firm is already maximizing profits.
   e) raise prices.

30) Chuck spends all his income on two goods: tacos and milkshakes. His income is \( 100, \) the price of tacos is \( 10, \) and the price of milkshakes is \( 2. \) If the prices of each good double and Chuck's income doubles, which of the following statements is correct?
   a) Chuck's budget line will be unaffected.
   b) Chuck's budget line will shift out.
   c) Chuck's budget line will shift in.
   d) Chuck will now be able to buy more of each good.
   e) Cannot tell from the information provided.

31) Joan loves to eat sushi. Her first piece of sushi normally yields a marginal benefit of \( 5. \) Each additional piece creates a declining marginal benefit by \( 0.25 \) per piece. If her favorite sushi bar charges \( 2.80 \) per piece of sushi, how many pieces should she eat?
   a) 8
   b) 10
   c) 9
   d) 11
   e) 1
32) (Figure: The Optimal Consumption Bundle) In the accompanying figure, if the price of restaurant meals ______, then the optimal consumption bundle will be on a ______ indifference curve.
   a) increases; higher.
   b) decreases; higher.
   c) increases; lower.
   d) decreases; lower.
   e) both b and c are correct.

33) Each month Jacquelyn spends exactly $50 on ice cream regardless of the price. Jacquelyn's price elasticity of demand for ice cream is:

   a) Zero
   b) One
   c) Greater than one
   d) Less than one, but greater than zero
   e) Not enough information is given.
Extra Problems focusing on elasticities

1. Each month Jessica buys exactly 15 Big Macs regardless of the price. Jessica's price elasticity of demand for Big Macs is:
   A) zero.
   B) one.
   C) greater than one.
   D) less than one.

Use the following to answer questions 2-3:

Table: Market for Pizza

<table>
<thead>
<tr>
<th>Price (per pizza)</th>
<th>Quantity of pizza demanded (given income of $1,000 per month)</th>
<th>Quantity of pizza demanded (given income of $1,400 per month)</th>
</tr>
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<tbody>
<tr>
<td>$20</td>
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<td>7</td>
</tr>
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<td>18</td>
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</tr>
<tr>
<td>6</td>
<td>10</td>
<td>14</td>
</tr>
</tbody>
</table>

2. (Table: Market for Pizza) In the accompanying table, the income elasticity of demand for pizza at a price of $14 per pizza when income changes from $1,000 to $1,400 per month using the midpoint method is:
   A) –1.
   B) 1.
   C) 1.25.
   D) 1.5.

3. (Table: Market for Pizza) In the accompanying table, the price elasticity of demand for pizza between prices of $14 and $12 per pizza when income is $1,000 per month (using the midpoint method) is:
   A) 0.6.
   B) 1.
   C) 1.6.
   D) 2.

4. Suppose the cross-price elasticity between demand for Burger King burgers and the price of McDonald's burgers is 0.8. If McDonald's increases the price of their burgers by 10%, then:
   A) Burger King will sell 10% more burgers.
   B) Burger King will sell 8% more burgers.
   C) Burger King will sell 8% fewer burgers.
   D) we cannot tell what will happen to Burger King, but McDonald's will sell 8% fewer burgers.
5. The University president believes that increasing student tuition by 5% will increase revenues. If the president is correct that revenues will increase, then the tuition increase will reduce the number of students enrolling by:
   A) less than 5%.
   B) more than 5%.
   C) exactly 5%.
   D) 0%, there will be no change in the number of students enrolling.

6. Suppose the price elasticity of demand for yachts equals 4.04, while the price elasticity of supply for yachts equals 0.22. If Congress reinstates a luxury tax on yachts, who will pay more of the tax?
   A) Yacht builders will pay more.
   B) Yacht buyers will pay more.
   C) Yacht builders and buyers will pay equally.
   D) It's impossible to tell without additional information.

7. Suppose you manage a convenience mart and are in charge of ordering products but do not set the price. The home office provides the prices. In your area, the income elasticity of demand for peanut butter is –0.5. Due to local factory closings, you expect local incomes to decrease by 20%, on average, in the next month. As a result, you should:
   A) stock 20% more peanut butter on the shelves.
   B) stock 5% more peanut butter on the shelves.
   C) stock 10% more peanut butter on the shelves.
   D) stock 10% less peanut butter on the shelves.

8. The price of watches of a new watch company decreases to $75 from $125. At the same time, demand for watches increased from 35 units (measured in 100,000s) to 45 units. Calculate the price elasticity of demand using the midpoint method.
   A) \( \frac{2}{5} \)
   B) \( \frac{1}{5} \)
   C) 1
   D) \( \frac{5}{7} \)
   E) None of the above

9. Suppose supply of a given good is perfectly elastic, and initial quantity supplied and price are 10 and $12. If the equilibrium quantity of demand increased from 10 to 15 (due to a demand shift), then the price of this good
   A) also increases
   B) does not change
   C) decreases
   D) will fall as long as demand shifts rightward.
   E) Cannot tell from the information given.
10. When the price of boxed macaroni and cheese falls 20 percent, the quantity demanded only increases 10 percent. This means that:
   A) The elasticity of demand is 2
   B) The elasticity of demand is ½
   C) Macaroni and cheese is an inferior good
   D) A) and C)
   E) B) and C)

11) A firm operating in long-run equilibrium in a perfectly competitive market will have economic profit equal to:

   a) Total fixed cost.
   b) Total variable costs
   c) The interest rate times the value of capital invested
   d) The present discounted value of future income streams
   e) Zero

I will also ask questions on readings! A sample is

12) One of your readings discussed a study by economists Judith Chevalier and Austan Goolsbee that found what about the college textbook market?

   a) Students generally buy the textbooks they are assigned making their demand inelastic.
   b) There can’t possibly be a person named Austan Goolsbee.
   c) Books available on the internet (like your textbook) are changing the market for textbook publishing.
   d) Students are less likely to purchase an assigned textbook the semester before the text will be revised.
   e) The textbook market in economics, unlike chemistry and the biological sciences, behaves more closely to the perfectly competitive model.
Sample Exam Answers

1 e, 2 d, 3 a, 4 d, 5 b, 6 c, 7 c, 8 e, 9 a, 10 e, 11 e, 12 b, 13 c, 14 a, 15 b, 16 c, 17 b, 18 a, 19 d, 20 e, 21 a, 22 c, 23 b, 24 b, 25 d, 26 c, 27 e, 28 e, 29 c, 30 a, 31 c, 32 e, 33 b

Answers to supplemental questions

1 a, 2 d, 3 b, 4 b, 5 a, 6 a, 7 c, 8 b, 9 b, 10 b, 11 e, 12 d