From the 2019 Administration

AP® CollegeBoard

AP® Microeconomics

Practice Exam

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Note: This publication shows the page numbers that appeared in the ***2018–19 AP Exam Instructions*** book and in the actual exam. This publication was not repaginated to begin with page 1.

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AP Macroeconomics Exam

Regularly Scheduled Exam Date: Wednesday afternoon, May 15, 2019

Late-Testing Exam Date: Friday afternoon, May 24, 2019

AP Microeconomics Exam

Regularly Scheduled Exam Date: Friday morning, May 17, 2019

Late-Testing Exam Date: Wednesday morning, May 22, 2019

Section I	**Total Time:** 1 hour and 10 minutes Calculator not permitted **Number of Questions:** 60 *(The number of questions may vary slightly depending on the form of the exam.)* **Percent of Total Score:** 66.67% **Writing Instrument:** Pencil required
Section II	**Total Time:** 1 hour *(10-minute reading period, 50-minute writing period)* Calculator not permitted **Number of Questions:** 3 required free-response questions **Percent of Total Score:** 33.33% **Writing Instrument:** Pen with black or dark blue ink

What Proctors Need to Bring to This Exam

- ☐ Exam packets
- ☐ Answer sheets
- ☐ AP Student Packs
- ☐ *2018-19 AP Coordinator's Manual*
- ☐ This book—*2018-19 AP Exam Instructions*
- ☐ AP Exam Seating Chart template
- ☐ School Code and Homeschool/Self-Study Codes
- ☐ Pencil sharpener
- ☐ Container for students' electronic devices (if needed)
- ☐ Extra No. 2 pencils with erasers
- ☐ Extra pens with black or dark blue ink
- ☐ Lined paper
- ☐ Stapler
- ☐ Watch
- ☐ Signs for the door to the testing room
  - "Exam in Progress"
  - "Phones of any kind are prohibited during the test administration, including breaks"

Macroeconomics

Before Distributing Exams: Check that the title on exam covers is ***Macroeconomics***, and is printed in **blue** on the Section I exam booklet covers. (On any large-type exams, the exam title will be printed in **black**.) If there are any exam booklets with a different title, contact the AP coordinator immediately.

Microeconomics

Before Distributing Exams: Check that the title on all exam covers is ***Microeconomics***, and is printed in **black**. If there are any exam booklets with a different title, contact the AP coordinator immediately.

SECTION I: Multiple Choice

› **Do not begin the exam instructions below until you have completed the appropriate General Instructions for your group.**

Make sure you begin the exam at the designated time. Remember, you must complete a seating chart for this exam. See pages 295–296 for a seating chart template and instructions. See the *2018-19 AP Coordinator's Manual* for exam seating requirements (pages 56–59).

Macroeconomics

If you are giving the regularly scheduled exam, say:

It is Wednesday afternoon, May 15, and you will be taking the AP Macroeconomics Exam. Look at your exam packet and confirm that the exam title is "AP Macroeconomics" and is printed in blue on the Section I booklet cover. [For large-type exams: **If you are taking a large-type exam, the exam title "AP Macroeconomics" is printed in black.] Raise your hand if your exam packet contains any title other than "AP Macroeconomics," and I will help you.**

If you are giving the alternate exam for late testing, say:

It is Friday afternoon, May 24, and you will be taking the AP Macroeconomics Exam. Look at your exam packet and confirm that the exam title is "AP Macroeconomics" and is printed in blue on the Section I booklet cover. [For large-type exams: **If you are taking a large-type exam, the exam title "AP Macroeconomics" is printed in black.] Raise your hand if your exam packet contains any title other than "AP Macroeconomics," and I will help you.**

Microeconomics

If you are giving the regularly scheduled exam, say:

It is Friday morning, May 17, and you will be taking the AP Microeconomics Exam. Look at your exam packet and confirm that the exam title is "AP Microeconomics" and is printed in black. Raise your hand if your exam packet contains any title other than "AP Microeconomics," and I will help you.

If you are giving the alternate exam for late testing, say:

It is Wednesday morning, May 22, and you will be taking the AP Microeconomics Exam. Look at your exam packet and confirm that the exam title is "AP Microeconomics" and is printed in black. Raise your hand if your exam packet contains any title other than "AP Microeconomics," and I will help you.

Once you confirm that all students have the correct exam, say:

In a moment, you will open the exam packet. By opening this packet, you agree to all of the AP Program's policies and procedures outlined in the *2018-19 Bulletin for AP Students and Parents*.

You may now remove the shrinkwrap from the outside only of your exam packet. Do not open the Section I booklet; do not remove the shrinkwrap from the Section II materials. Put the white seals and the shrinkwrapped Section II booklet aside. . . .

Carefully remove the AP Exam label found near the top left of your exam booklet cover. Place it on page 1 of your answer sheet on the light blue box near the top right corner that reads "AP Exam Label."

If students accidentally place the exam label in the space for the number label or vice versa, advise them to leave the labels in place. They should not try to remove the label; their exam can still be processed correctly.

Listen carefully to all my instructions. I will give you time to complete each step. Please look up after completing each step. Raise your hand if you have any questions.

Give students enough time to complete each step. Don't move on until all students are ready.

Read the statements on the front cover of the Section I booklet. . . .

Sign your name and write today's date. . . .

Now print your full legal name where indicated. . . .

Turn to the back cover of your exam booklet and read it completely. . . .

Give students a few minutes to read the entire cover.

Are there any questions? . . .

You will now take the multiple-choice portion of the exam. You should have in front of you the multiple-choice booklet and your answer sheet. You may never discuss the multiple-choice exam content at any time in any form with anyone, including your teacher and other students. If you disclose the multiple-choice exam content through any means, your AP Exam score will be canceled.

Open your answer sheet to page 2. You must complete the answer sheet using a No. 2 pencil only. Mark all of your responses beginning on page 2 of your answer sheet, one response per question. Completely fill in the circles. If you need to erase, do so carefully and completely. No credit will be given for anything written in the exam booklet. Scratch paper is not allowed, but you may use the margins or any blank space in the exam booklet for scratch work. Calculators are not allowed on any part of this exam. Are there any questions? . . .

You have 1 hour and 10 minutes for this section. Open your Section I booklet and begin.



Note Start Time _____. Note Stop Time _____.

Check that students are marking their answers in pencil on their answer sheets and that they have not opened their shrinkwrapped Section II booklets.

After one hour, say:

There are 10 minutes remaining.

After 10 minutes, say:

Stop working. Close your booklet and put your answer sheet on your desk, faceup. Make sure you have your AP number label and an AP Exam label on page 1 of your answer sheet. Sit quietly while I collect your answer sheets.

Collect an answer sheet from each student. Check that each answer sheet has an AP number label and an AP Exam label.

After all answer sheets have been collected, say:

Now you must seal your exam booklet using the white seals you set aside earlier. Remove the white seals from the backing and press one on each area of your exam booklet cover marked "PLACE SEAL HERE." Fold each seal over the back cover. When you have finished, place the booklet on your desk, faceup. I will now collect your Section I booklet. . . .

Collect a Section I booklet from each student. Check that each student has signed the front cover of the sealed Section I booklet.

There is a 10-minute break between Sections I and II. When all Section I materials have been collected and accounted for and you are ready for the break, say:

Please listen carefully to these instructions before we take a 10-minute break. All items you placed under your chair at the beginning of this exam, including your Student Pack, must stay there, and you are not permitted to open or access them in any way. Leave your shrinkwrapped Section II packet on your desk during the break. You are not allowed to consult teachers, other students, notes, textbooks, or any other resources during the break. You may not make phone calls, send text messages, check email, use a social networking site, or access any electronic or communication device. You may not leave the designated break area. Remember, you may never discuss the multiple-choice exam content with anyone, and if you disclose the content through any means, your AP Exam score will be canceled. Are there any questions? . . .



You may begin your break. Testing will resume at _____ .

SECTION II: Free Response

After the break, say:

May I have everyone's attention? Place your Student Pack on your desk. . . .

You may now remove the shrinkwrap from the Section II packet, but do not open the exam booklet until you are told to do so. . . .

Read the bulleted statements on the front cover of the exam booklet. Look up when you have finished. . . .

Now take an AP number label from your Student Pack and place it on the shaded box. If you don't have any AP number labels, write your AP number in the box. Look up when you have finished. . . .

Read the last statement. . . .

Using your pen, print the first, middle, and last initials of your legal name in the boxes and print today's date where indicated. This constitutes your signature and your agreement to the statements on the front cover. . . .

Now turn to the back cover. Using your pen, complete Items 1 through 3 under "Important Identification Information." . . .

Read Item 4. . . .

Are there any questions? . . .

If this is your last AP Exam, you may keep your Student Pack. Place it under your chair for now. Otherwise if you are taking any other AP Exams this year, leave your Student Pack on your desk and I will collect it now. . . .

Read the information on the back cover of the exam booklet. Do not open the booklet until you are told to do so. Look up when you have finished. . . .

Collect the Student Packs from students who are taking any other AP Exams this year.

Then say:

Are there any questions? . . .

The total Section II time is one hour. This includes a 10-minute reading period. The reading period is designed to provide you with time to develop thoughtful, well-organized responses. You are advised to take advantage of the reading period to plan what you will write. You may begin writing your exam responses before the reading period is over. You may make notes on page 3 and the pages that contain the exam questions, but your responses must be written on the designated lined pages. Are there any questions? . . .

You are responsible for pacing yourself and may proceed freely from one question to the next. You must write your answers in the Section II booklet using a pen with black or dark blue ink. You are not permitted to use other colored pens or pencils to draw graphs or diagrams. If you need more paper to complete your responses, raise your hand. At the top of each extra sheet of paper you use, write only:

- **your AP number,**
- **the exam title, and**
- **the question number you are working on.**

Do not write your name.

Make sure to begin your response on the lined page directly following the first appearance of the question and continue your response on the additional lined pages that follow. Remember to write your answers on the lined pages provided for each question; only responses written on the lined pages will be scored.

You may now open the Section II booklet and begin the 10-minute reading period.

Note Start Time _____ . **Note Stop Time** _____ .

After 10 minutes, say:

The reading period is over. You have 50 minutes remaining to complete Section II.

Note Start Time _____ . **Note Stop Time** _____ .

Check that students are using pens and that they are writing their answers in their exam booklets.

After 40 minutes, say:

There are 10 minutes remaining.

After 10 minutes, say:

Stop working and close your exam booklet. Place it on your desk, faceup. . . .

If any students used extra paper for a question in the free-response section, have those students staple the extra sheet(s) to the first page corresponding to that question in their free-response exam booklets. Complete an Incident Report after the exam and return these free-response booklets with the extra sheets attached in the Incident Report return envelope (see page 68 of the *2018-19 AP Coordinator's Manual* for complete details).

Then say:

Remain in your seat, without talking, while the exam materials are collected. . . .

Collect a Section II booklet from each student. Check for the following:

- Exam booklet front cover: The student placed an AP number label on the shaded box and printed their initials and today's date.
- Exam booklet back cover: The student completed the "Important Identification Information" area.

When all exam materials have been collected and accounted for, return to students any electronic devices you may have collected before the start of the exam.

If you are giving the regularly scheduled exam, say:
You may not discuss or share the free-response exam content with anyone unless it is released on the College Board website in about two days. Your AP Exam score results will be available online in July.

If you are giving the alternate exam for late testing, say:
None of the content in this exam may ever be discussed or shared in any way at any time. Your AP Exam score results will be available online in July.

If any students completed the AP number card at the beginning of this exam, say:

Please remember to take your AP number card with you. You will need the information on this card to view your scores and order AP score reporting services online.

Then say:

You are now dismissed.

After-Exam Tasks

Be sure to give the completed seating chart to the AP coordinator. Schools must retain seating charts for at least six months (unless the state or district requires that they be retained for a longer period of time). Schools should not return any seating charts in their exam shipments unless they are required as part of an Incident Report.

NOTE: If you administered exams to students with accommodations, review the *2018-19 AP Coordinator's Manual* and the *2018-19 AP SSD Guidelines* for information about completing the Nonstandard Administration Report (NAR) form, and returning these exams.

The exam proctor should complete the following tasks if asked to do so by the AP coordinator. Otherwise, the AP coordinator must complete these tasks:

- Complete an Incident Report for any students who used extra paper for the free-response section. (Incident Report forms are provided in the coordinator packets sent with the exam shipments.) **These forms must be completed with a No. 2 pencil.** It is best to complete a single Incident Report for multiple students per exam subject, per administration (regular or late testing), as long as all required information is provided. Include all exam booklets with extra sheets of paper in an Incident Report return envelope (see page 68 of the *2018-19 AP Coordinator's Manual* for complete details).
- Return all exam materials to secure storage until they are shipped back to the AP Program. (See page 27 of the *2018-19 AP Coordinator's Manual* for more information about secure storage.) Before storing materials, check the "School Use Only" section on page 1 of the answer sheet and:
  - Fill in the appropriate section number circle in order to access a separate AP Instructional Planning Report (for regularly scheduled exams only) or subject score roster at the class section or teacher level. See "Post-Exam Activities" in the *2018-19 AP Coordinator's Manual.*
  - Check your list of students who are eligible for fee reductions and fill in the appropriate circle on their registration answer sheets.

Name:_____

Answer Sheet for AP Microeconomics

Practice Exam, Section I

No.	Answer
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No.	Answer
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AP® Microeconomics Exam

SECTION I: Multiple Choice

2019

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.

At a Glance

Total Time
1 hour and 10 minutes
Number of Questions
60
Percent of Total Score
66.67%
Writing Instrument
Pencil required
Electronic Device
None allowed

Instructions

Section I of this exam contains 60 multiple-choice questions. Fill in only the circles for numbers 1 through 60 on your answer sheet.

Indicate all of your answers to the multiple-choice questions on the answer sheet. No credit will be given for anything written in this exam booklet, but you may use the booklet for notes or scratch work. After you have decided which of the suggested answers is best, completely fill in the corresponding circle on the answer sheet. Give only one answer to each question. If you change an answer, be sure that the previous mark is erased completely. Here is a sample question and answer.

Sample Question	Sample Answer
Chicago is a (A) state (B) city (C) country (D) continent (E) village	Ⓐ ● Ⓒ Ⓓ Ⓔ

Use your time effectively, working as quickly as you can without losing accuracy. Do not spend too much time on any one question. Go on to other questions and come back to the ones you have not answered if you have time. It is not expected that everyone will know the answers to all of the multiple-choice questions.

Your total score on the multiple-choice section is based only on the number of questions answered correctly. Points are not deducted for incorrect answers or unanswered questions.

Form I
Form Code 4PBP4-S

The inclusion of source material in this exam is not intended as an endorsement by the College Board or ETS of the content, ideas, or values expressed in the material. The material has been selected by the economics faculty who serve on the AP Microeconomics Development Committee. In their judgment, the material printed here reflects various aspects of the course of study on which this exam is based and is therefore appropriate to use to measure the skills and knowledge of this course.

MICROECONOMICS

Section I

Time—1 hour and 10 minutes

60 Questions

Directions: Each of the questions or incomplete statements below is followed by five suggested answers or completions. Select the one that is best in each case and then fill in the corresponding circle on the answer sheet.

1. Which of the following is a defining characteristic of a market economy?

   (A) Private ownership of resources
   (B) Equitable distribution of income
   (C) Taxation of personal income
   (D) Reliance on public goods
   (E) Government-guided resource allocation

Good X (units)	Good Y (units)
0	100
20	95
40	85
60	65
80	35
100	0

2. The table above shows the maximum possible output combinations of good X and good Y that Microland can produce by using all of its available resources and technology. As the production of good X increases, what happens to the opportunity cost of producing good X?

   (A) It decreases, because the production of good Y decreases by greater amounts.
   (B) It decreases, because the production of good Y increases by smaller amounts.
   (C) It remains constant, because the production of good X increases by the same amount.
   (D) It increases, because the production of good Y decreases by greater amounts.
   (E) It increases, because the production of good Y increases by smaller amounts.

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GO ON TO THE NEXT PAGE.

3. An increase in the supply of good X resulted in an increase in the price and quantity of good Y. It can be concluded that good Y is

   (A) an inferior good
   (B) a luxury good
   (C) a normal good
   (D) a substitute for good X
   (E) a complement for good X

4. Which of the following will shift the supply curve for apples to the right?

   (A) An increase in consumers' income
   (B) An increase in the price of apples
   (C) An increase in the wages of apple pickers
   (D) A decrease in the rental price for apple harvesting equipment
   (E) A decrease in the demand for oranges, a substitute in consumption

5. Which of the following relationships among the price elasticity of demand, change in price, and change in total revenue is consistent?

	Price Elasticity of Demand	Change in Price	Change in Total Revenue
(A)	Elastic	Increase	Increase
(B)	Elastic	Decrease	Decrease
(C)	Unit Elastic	Decrease	Decrease
(D)	Inelastic	Decrease	Increase
(E)	Inelastic	Decrease	Decrease

6. Which of the following best describes how a consumer maximizes total utility from the consumption of a bundle of goods and services?

   (A) By choosing the quantity of each good such that the quantity demanded of each good is equal to the quantity supplied
   (B) By choosing the quantity of each good such that the marginal utility from each good is equal to zero
   (C) By choosing the quantity of each good such that the price is equal to the marginal revenue
   (D) By choosing the level of output where marginal revenue is equal to marginal cost
   (E) By choosing the combination of goods such that the marginal utility per dollar spent on the last unit of each good is equal

7. The marginal benefit of consuming a good is

   (A) the change in average utility that results from consuming one more unit of the good
   (B) the same as the total benefit
   (C) equal to the marginal cost of the good
   (D) the change in total expenditures as a result of buying one more unit of the good
   (E) the maximum amount a consumer is willing to pay for one more unit of the good

8. The economic concept of total consumer surplus refers to which of the following?

   (A) The difference between the quantity of a good or service that people purchase and the amount that they actually consume
   (B) The overproduction of goods and services relative to the socially optimal level of output
   (C) The sum of the differences between the prices that consumers are willing to pay for a good or service and the price they actually pay
   (D) The sum of the differences between the prices that consumers are willing to pay for a good or service and the minimum prices that sellers must receive to offer that quantity
   (E) The difference between the quantity demanded and the quantity supplied of a product at a given price

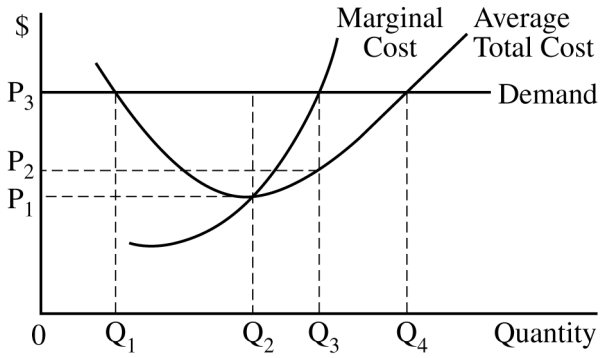
9. The table below is partially filled in with the different types of costs for a firm. Based on the information in the table, what is the marginal cost of producing the second unit?

Quantity	Variable Cost	Fixed Cost	Total Cost	Average Total Cost
0	$0	$60		
1			$130	
2				$90

   (A) $50
   (B) $60
   (C) $70
   (D) $90
   (E) $180

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GO ON TO THE NEXT PAGE.



10. How many units of output should a firm with the cost and demand curves shown above produce to maximize profit?

(A) 0
(B) Q_1
(C) Q_2
(D) Q_3
(E) Q_4

11. Currently, XYZ Corporation can produce 50 units of output using 20 workers and 8 units of capital. Which of the following changes in the number of workers, units of capital, and quantity of output are consistent with constant returns to scale?

	Workers	Capital	Output
(A)	40	8	100
(B)	40	16	90
(C)	20	4	25
(D)	10	4	25
(E)	10	8	25

12. If the four largest firms in a market produce 88 percent of total industry output, the market is

(A) perfectly competitive
(B) a pure monopoly
(C) a natural monopoly
(D) an oligopoly
(E) a monopsony

13. In monopolistic competition, an individual firm's market power stems from which of the following?

(A) Economies of scale in production
(B) The production of a differentiated product
(C) The absence of perfectly competitive firms that produce similar products
(D) Barriers to entry allowing firms to earn economic profit
(E) The maintenance of excess capacity to meet unexpected increase in demand

14. A profit-maximizing firm hires labor in a perfectly competitive market. Labor is the only variable input, and the marginal product of the last worker hired is 10 units per hour. If the hourly wage is $20, the firm's marginal revenue

(A) is $2
(B) is $20
(C) increases as more output is produced
(D) increases first and then decreases as more output is produced
(E) decreases first and then increases as more output is produced

15. Assume the demand curve for a good is perfectly inelastic and the production of each unit of this good generates external costs. A profit-maximizing firm producing the good in an unregulated free market will

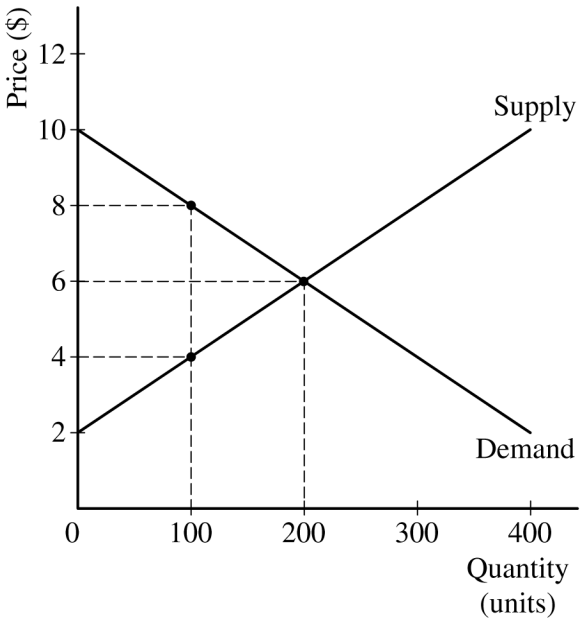
(A) generate deadweight loss because marginal social cost is greater than marginal private cost.
(B) generate deadweight loss only if marginal costs are constant
(C) not generate deadweight loss because the equilibrium quantity is socially optimal
(D) not generate deadweight loss unless marginal costs are constant
(E) not generate deadweight loss unless fixed costs are zero

16. A linear production possibilities curve indicates which of the following?

(A) Constant opportunity costs
(B) Decreasing opportunity costs
(C) Increasing opportunity costs
(D) Diminishing marginal returns
(E) Labor-intensive production

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17. Assume that the government imposes a $4 per-unit tax on sellers of a good in the market described by the graph above. What are the price paid by buyers, the after-tax price received by sellers, and the deadweight loss?

	Price Paid by Buyers	Price Received by Sellers	Deadweight Loss
(A)	$8	$6	$100
(B)	$8	$4	$200
(C)	$6	$6	$0
(D)	$4	$8	$100
(E)	$4	$8	$200

---

18. Which of the following must be true if at the tenth unit of output, marginal cost (MC) is $130 and average total cost (ATC) is $150 ?

(A) ATC of producing the ninth unit is higher than $150.
(B) ATC of producing the ninth unit is less than $150.
(C) MC of producing the ninth unit is higher than $130.
(D) Average variable cost of producing the tenth unit is higher than $150.
(E) Average variable cost of producing the tenth unit is equal to $20.

19. Which of the following occurs as a result of the substitution effect of an increase in the price of a normal good?

(A) The demand for the good decreases.
(B) The demand for the complementary good increases.
(C) The demand for the good becomes more elastic.
(D) The quantity demanded of the substitute good decreases.
(E) The quantity demanded of the good decreases.

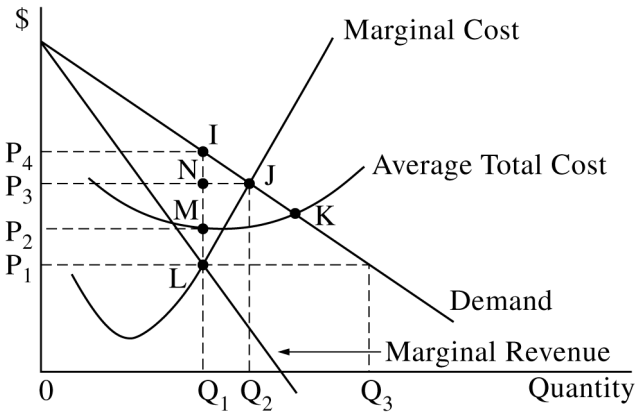
Number of Workers	Quantity of Output
0	0
1	10
2	25
3	35
4	40
5	42

20. Given the production schedule above, what is the maximum number of workers the firm can hire before the effects of diminishing marginal returns set in?

(A) 1
(B) 2
(C) 3
(D) 4
(E) 5

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21. Which of the following combinations of output, price, and economic profit is consistent for the profit-maximizing monopolist depicted in the graph above?

	Output	Price	Economic Profit
(A)	Q_1	P_1	$0P_1LQ_1$
(B)	Q_1	P_4	P_1P_4IL
(C)	Q_1	P_4	P_2P_4IM
(D)	Q_2	P_3	P_2P_3NM
(E)	Q_3	P_1	P_1P_2ML

		Town Herald: Do Not Change Subscription Price	*Town Herald*: Increase Subscription Price
Daily Voice	Do Not Change Subscription Price	\$500, \$400	\$200, \$700
	Increase Subscription Price	\$600, \$300	\$300, \$100

22. The two major newspapers in a city, *Daily Voice* and *Town Herald*, are considering whether to raise the subscription price. The first entries in the matrix above show the profits to *Daily Voice*, and the second entries show the profits to *Town Herald*. Which of the following is consistent with the above payoff matrix?

(A) Do Not Change Subscription Price is a dominant strategy for *Daily Voice*.
(B) Do Not Change Subscription Price is a dominant strategy for *Town Herald*.
(C) Increase Subscription Price is a dominant strategy for *Daily Voice*.
(D) Increase Subscription Price is a dominant strategy for *Town Herald*.
(E) There are no dominant strategies in the above payoff matrix.

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23. If a firm engages in perfect price discrimination, it charges

(A) each customer the highest price the customer is willing to pay
(B) each customer the average cost of the product
(C) each customer the lowest price the customer is willing to pay
(D) different prices to customers based on how old they are
(E) different prices to customers based on how many units of output they buy

24. Assume a perfectly competitive firm is currently producing 100 units of output. Its marginal cost is $6 and rising at that output quantity. Its average variable cost is $7 and its average fixed cost is $3. If the product's price is $6, which of the following will the firm do in the short run to maximize its profit?

(A) Shut down
(B) Produce, but less than 100 units of output
(C) Produce more than 100 units of output
(D) Continue to produce at exactly 100 units of output
(E) Increase its price above $6

Questions 25-26 refer to the data in the table below.

A perfectly competitive firm operates with a fixed amount of capital that costs $1,000 per day. Labor is the only variable input. The firm hires labor in a perfectly competitive labor market at $100 per day per worker. The table below shows the firm's production function.

Number of Workers Hired	Quantity of Output (units)
0	0
1	10
2	30
3	54
4	75
5	85
6	90

25. What is the marginal product of the third worker?

(A) 5
(B) 10
(C) 20
(D) 24
(E) It cannot be determined from the information given.

26. The firm will maximize profit in the short run if it

(A) shuts down and the price is $10
(B) produces 30 units and the price is $4
(C) produces 30 units and the price is $10
(D) produces 54 units and the price is $4
(E) produces 85 units and the price is $10

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Hours of Labor	Marginal Product
0	0
1	10
2	12
3	9
4	7
5	4

27. The table above shows how a firm's hourly level of output changes as more of the labor input is employed. The firm sells its output and hires labor in perfectly competitive markets. The wage paid to labor is $10 per hour, and the price of the firm's output is $2 per unit. Based on the data in the table, the marginal revenue product of the fourth hour of labor is equal to

(A) $4
(B) $7
(C) $14
(D) $26
(E) $70

Levels of Cleanup	Total Cost of Cleanup ($)	Total Benefit of Cleanup ($)
0	0	0
1	7	45
2	37	80
3	92	105
4	172	125
5	272	140

28. The table above shows the total cost and the total benefit of cleaning up pollution in a community. Which of the following cleanup levels is socially optimal?

(A) 1
(B) 2
(C) 3
(D) 4
(E) 5

29. The Lorenz curve represents the relationship between

(A) the cumulative percentage of households and the cumulative percentage of income
(B) income tax rates and income tax revenues
(C) child labor rates and the poverty levels
(D) income inequality and education level
(E) market structure and the number of firms in the market

30. Antitrust laws are designed to maintain a competitive market environment by

(A) eliminating monopolies wherever they exist
(B) preventing monopolies from generating negative externalities
(C) limiting practices that increase a firm's market power
(D) imposing price ceilings on products produced by monopolies
(E) making charging a price above marginal cost illegal

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Country	Opportunity Cost of 1 Ton of Apples	Opportunity Cost of 1 Ton of Oranges
X	1 ton of oranges	1 ton of apples
Y	2 tons of oranges	0.5 ton of apples

31. The table above shows the opportunity costs of producing apples and oranges in Countries X and Y. Which of the following can be concluded based on the data given in the table?

(A) Country Y has an absolute advantage in producing both goods.
(B) Country Y has a comparative advantage in producing both goods.
(C) Country X has an absolute advantage in producing both goods.
(D) Country X has a comparative advantage in producing oranges.
(E) Country X has a comparative advantage in producing apples.

32. If the price elasticity of supply for pickles is 2 and the price of pickles increases by 10 percent, then the quantity supplied of pickles will increase by

(A) 0.2%
(B) 5%
(C) 8%
(D) 12%
(E) 20%

33. If a 10 percent increase in the price of good X results in a 20 percent decrease in the quantity of good Y demanded, which of the following is true?

(A) Good X and good Y are complementary goods, and the cross-price elasticity is −0.5.
(B) Good X and good Y are substitute goods, and the income elasticity is +2.
(C) Good X and good Y are complementary goods, and the cross-price elasticity is −2.
(D) Good X and good Y are normal goods, and the income elasticity is +2.
(E) Good X and good Y are substitute goods, and the cross-price elasticity is −2.

34. Which of the following provides a possible explanation for a simultaneous increase in the equilibrium price and the quantity of blueberries in a market?

(A) An increase in the price of strawberries, a substitute
(B) An increase in the supply of strawberries, a substitute
(C) An increase in the price of farmland used to grow blueberries
(D) A decrease in the price of blueberry harvesting equipment
(E) Imposition of a price floor in the market for blueberries

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35. The table below shows the per-unit prices and marginal utility for the last unit of video games and comic books that Kyle purchased.

	Video Games	Comic Books
Price per unit	$25	$10
Marginal utility	50	50

Kyle spent all of his allocated budget on video games and comic books. To maximize his utility, Kyle should have purchased

(A) more video games and fewer comic books
(B) fewer video games and more comic books
(C) fewer of both goods
(D) equal amounts of both goods
(E) more of both goods

36. A perfectly competitive firm currently produces 1,000 units of output and hires its resources in a perfectly competitive factor market. It uses both labor and capital as inputs. The price of labor is $40; the price of capital is $100. The marginal product of labor is 8 units, and the marginal product of capital is 10 units. Which of the following must be true?

(A) The firm is currently maximizing its profit.

(B) The firm can produce more than 1,000 units without increasing the total cost if it uses more labor and less capital.

(C) The firm can produce more than 1,000 units without increasing the total cost if it uses more capital and less labor.

(D) The firm can reduce the cost of producing 1,000 units by using less capital and employing the same amount of labor.

(E) The firm can reduce the cost of producing 1,000 units by employing less labor and using the same amount of capital.

37. When two firms interact in an oligopolistic market, which of the following statements is true?

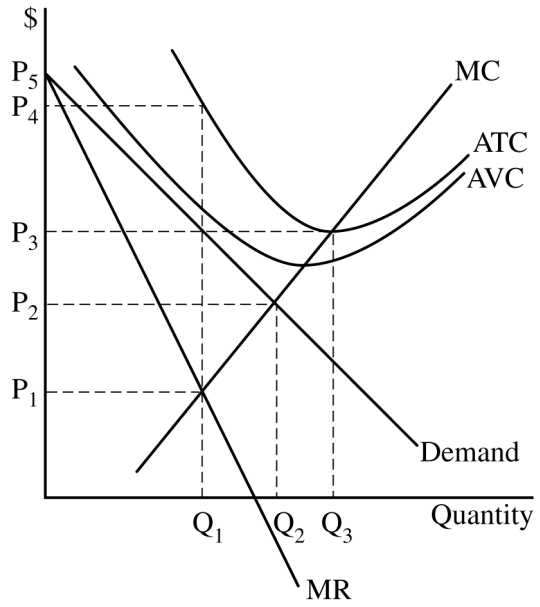
(A) If one firm has a dominant strategy, then the other firm does not have a dominant strategy.
(B) If one firm has a dominant strategy, then the other firm also has a dominant strategy.
(C) Both firms must have dominant strategies.
(D) If one firm has a dominant strategy, then there is no Nash equilibrium.
(E) If both firms have dominant strategies, then there is a Nash equilibrium.

38. Which of the following is true when a profit-maximizing monopolist produces in the elastic portion of its demand curve?

(A) It can increase total revenue by raising price.
(B) It can decrease average total cost by reducing output.
(C) Price is equal to marginal revenue.
(D) Marginal revenue is less than marginal cost.
(E) Marginal revenue is positive.

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Questions 39-40 refer to the cost and revenue conditions of a monopolistically competitive firm shown in the graph below. MC = marginal cost, ATC = average total cost, AVC = average variable cost, and MR = marginal revenue.



39. The firm's profit-maximizing output in the short run is

(A) zero, because P < AVC
(B) Q_1, because MR = MC
(C) Q_2, because P = MC
(D) Q_3, because MC = ATC
(E) impossible to determine

40. Which of the following will the firm do in the long run if market conditions do not change?

(A) It will increase output to Q_2 and lower price to P_2 to minimize losses.
(B) It will increase output to Q_3 and raise price to P_4 to earn zero economic profit.
(C) It will produce Q_1 and set price equal to marginal revenue.
(D) It will exit the industry.
(E) It will build a larger plant to achieve decreasing returns to scale.

41. At the current quantity that a firm is selling, the firm has marginal revenue of $750 and marginal cost of $800. Which of the following is true?

(A) The firm is maximizing profit.
(B) The firm's profits would increase if the firm increased the quantity sold.
(C) The firm's profits would increase if the firm decreased the quantity sold.
(D) The firm earns negative economic profit.
(E) The firm earns zero accounting profit.

42. Which of the following is true of a monopsony in a labor market?

(A) It faces a labor supply curve that is horizontal at the competitive market equilibrium wage.
(B) Its marginal factor (resource) cost is the same as the market supply curve.
(C) At its optimal level of employment, it pays a wage rate higher than the competitive market wage rate.
(D) The imposition of a minimum wage results in a larger reduction in employment than is true in a competitive market.
(E) Its marginal factor (resource) cost curve lies above the labor supply curve because hiring an extra worker means paying more to existing workers.

43. Which of the following indicates that a perfectly competitive firm has hired the profit-maximizing amount of labor?

(A) The total product of labor exceeds the total real wage payments to workers.
(B) The average product of labor exceeds the real wage paid to workers.
(C) The marginal revenue product of labor is below the wage paid to workers.
(D) The marginal revenue product of labor is above the wage paid to workers.
(E) The marginal revenue product of labor equals the wage paid to workers.

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44. In a competitive market in which the production of a good causes pollution, the socially optimal output is different from the competitive market equilibrium output of that good because the

(A) marginal social benefit is higher than the marginal social cost
(B) marginal social benefit is lower than the marginal private cost
(C) marginal social cost is higher than the marginal private cost
(D) marginal social benefit is higher than the marginal private benefit
(E) total social cost is less than the total social benefit

45. Which of the following explains why free-riding can result in a market failure?

(A) More than the socially optimal quantity is produced and consumed.
(B) The socially optimal quantity is produced but less than the socially optimal quantity is consumed.
(C) Private producers of nonexcludable goods are unable to charge everyone who consumes the good.
(D) There is a market surplus of the good.
(E) There is no consumer surplus derived from the good.

46. Individual private property rights provide people incentives to

(A) meet societal goals rather than pursue their own self-interest
(B) produce goods and services regardless of market demand
(C) achieve equitable distribution of goods and services through competitive markets
(D) focus only on benefits without regard to costs
(E) produce goods and services that are valued in markets

47. Assume the market for disposable coffee cups is in equilibrium and disposable coffee cups are inputs for serving brewed coffee. Which of the following will result in a higher short-run equilibrium price of disposable coffee cups?

(A) A decrease in the supply of coffee
(B) A decrease in the number of locations serving brewed coffee
(C) An increase in the supply of disposable coffee cups
(D) An increase in the demand for brewed coffee
(E) An increase in the price of tea, a complement for coffee

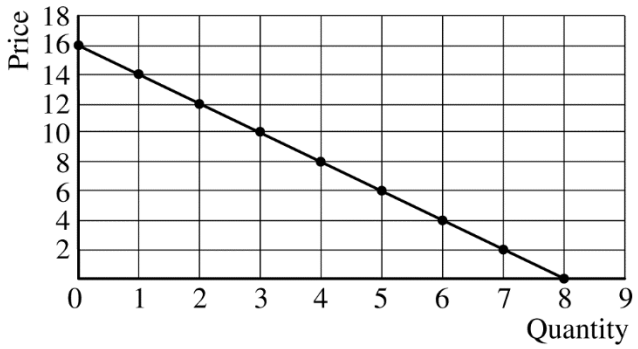
48. The equilibrium price for a good with a vertical supply curve and a downward-sloping demand curve is $20. If a binding price floor is set, which of the following will occur?

(A) There will be a shortage of the good.
(B) The sum of consumer and producer surpluses will decrease.
(C) The equilibrium price of the good will decrease.
(D) The quantity sold of the good will remain unchanged.
(E) Demand for substitutes for the good will decrease.

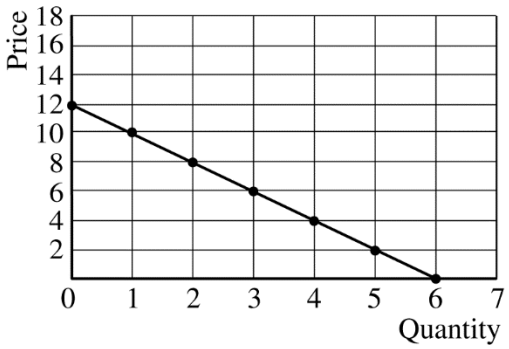
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Adey



Sarah



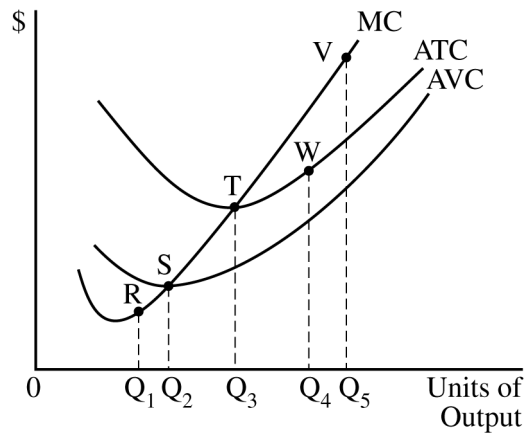
49. The graphs above show the individual demand curves for the only two consumers, Adey and Sarah, in the market for popcorn. As the price of popcorn decreases from \$12 to \$6, how does the quantity demanded change along the market demand curve?

(A) It increases from 2 to 4 units.
(B) It increases from 2 to 5 units.
(C) It increases from 2 to 8 units.
(D) It increases from 0 to 14 units.
(E) It increases from 8 to 14 units.

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50. Which of the following is true for a firm that uses labor as a variable input and capital as a fixed input in the short run?

(A) If the marginal product of labor is negative, the average product of labor must also be negative.
(B) If the marginal product of labor is rising, the average product of labor must be greater than the marginal product of labor.
(C) If the average product of labor is rising, the marginal product of labor must be rising.
(D) If the average product of labor is falling, the marginal product of labor must be less than the average product of labor.
(E) The average product of labor can never be equal to the marginal product of labor.



51. The graph above shows the cost curves facing May's Fruit Farm, where MC is marginal cost, ATC is average total cost, and AVC is average variable cost. May's short-run supply curve includes which of the following points?

(A) TW
(B) RST
(C) STV
(D) STW
(E) RSTV

52. The characteristic that causes firms in a perfectly competitive industry to earn zero economic profits in the long run is

(A) firms are price takers
(B) firms produce identical products
(C) individual firms account for a small fraction of the total market
(D) the industry supply curve is horizontal
(E) there are no barriers to entry or exit

53. If individual firms in a perfectly competitive market are earning positive economic profits, the number of firms and the price of the product in the market will most likely change in which of the following ways in the long run?

	Number of Firms	Price
(A)	Increase	Increase
(B)	Decrease	Increase
(C)	Increase	Decrease
(D)	Decrease	Decrease
(E)	No change	Decrease

54. Jamal quits a job that was paying him $30,000 per year and decides to start his own business. He runs his business out of his house in a room he had been renting to his colleague for $12,000 a year. Jamal withdraws the $20,000 in his savings account that had been earning him a 10 percent annual interest to purchase computers and related accessories and equipment for the business. During the first year of operation, Jamal's business incurred $30,000 in explicit costs and generated $60,000 in total sales. Jamal's economic profit is

(A) $30,000
(B) $17,000
(C) $0
(D) – $2,000
(E) – $14,000

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55. Firms in monopolistic competition do not attain allocative efficiency because at the long-run equilibrium output, which of the following is true?

(A) Price is greater than marginal cost.
(B) Marginal cost is greater than minimum average total cost.
(C) Marginal revenue is greater than marginal cost.
(D) There is an overallocation of resources to the market.
(E) Products are homogeneous.

56. A perfectly competitive firm is producing 10 units of output and sells the product for $5 per unit. At this level of output the average total cost is $4, the average variable cost is $3 and the marginal cost is $7. What should this firm do to maximize short-run profits?

(A) Increase output until price equals average total cost.
(B) Increase output until price equals marginal cost.
(C) Leave output unchanged because price is greater than average total cost.
(D) Decrease output until price is equal to marginal cost.
(E) Decrease output until price is equal to average total cost.

57. Assume accountants and teachers have identical marginal revenue product schedules. Which of the following provides an explanation for why accountants receive higher starting salaries than school teachers?

(A) Accountants have less human capital than school teachers.
(B) Accountants have lower opportunity cost than school teachers.
(C) Accounting firms provide a more pleasant work environment than schools provide.
(D) The supply of accountants is low relative to the supply of teachers.
(E) Fewer teaching majors graduate from college each year than accounting majors.

58. Assume that firms providing health-care services to older people operate in a perfectly competitive market. What must happen in the market for health-care workers if there is an increase in the number of older people in a country?

(A) The demand for health-care workers will increase.
(B) The marginal factor cost in the health-care industry will decrease.
(C) The number of health-care workers will decrease.
(D) The quality of health-care services will increase.
(E) The wages of health-care workers will decrease.

59. As an unregulated monopolist, City Cable is earning positive economic profits. If the government regulated the firm by requiring it to produce the level of output that allowed the firm to earn zero economic profit, City Cable would set a price that is equal to its

(A) marginal cost
(B) marginal revenue
(C) average total cost
(D) average variable cost
(E) total cost

60. A progressive income tax is characterized by

(A) a higher average tax rate at low income levels than at high income levels
(B) tax rates that increase total tax revenues
(C) marginal tax rates that do not change as income changes
(D) marginal tax rates that increase as income increases
(E) marginal tax rates that decrease as income increases

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END OF SECTION I

IF YOU FINISH BEFORE TIME IS CALLED, YOU MAY CHECK YOUR WORK ON THIS SECTION.

DO NOT GO ON TO SECTION II UNTIL YOU ARE TOLD TO DO SO.

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AP® Microeconomics Exam

SECTION II: Free Response

2019

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.

At a Glance

Total Time
1 hour
Number of Questions
3
Percent of Total Score
33.33%
Writing Instrument
Pen with black or dark blue ink
Electronic Device
None allowed

Reading Period

Time
10 minutes. Use this time to read the questions and plan your answers. You may begin writing your responses before the reading period is over.

Writing Period

Time
50 minutes

Question 1
Suggested Time
25 minutes
Percent of Section II Score
50%

Question 2
Suggested Time
12.5 minutes
Percent of Section II Score
25%

Question 3
Suggested Time
12.5 minutes
Percent of Section II Score
25%

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   First letter of your first name ☐
2. Date of birth
   ☐☐ Month ☐☐ Day ☐☐☐☐ Year
3. Six-digit school code
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Instructions

The questions for Section II are printed in this booklet. You may use page 3 and the pages the questions are printed on to organize your answers and for scratch work, but you must write your answers on the lined pages provided for each question.

The proctor will announce the beginning and end of the reading period. You are advised to spend the 10-minute period reading all the questions and planning your answers. You may begin writing your responses before the reading period is over.

Write clearly and legibly. Do not skip lines. Cross out any errors you make; crossed-out work will not be scored.

Manage your time carefully. You may proceed freely from one question to the next. You may review your responses if you finish before the end of the exam is announced.

Form I
Form Code 4PBP4-S

MICROECONOMICS

Section II

Total Time—1 hour

Reading Period—10 minutes

Writing Period—50 minutes

Directions: You are advised to spend the first 10 minutes reading all of the questions and planning your answers. You will then have 50 minutes to answer all three of the following questions. You may begin writing your responses before the reading period is over. It is suggested that you spend approximately half your time on the first question and divide the remaining time equally between the next two questions. Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. Use a pen with black or dark blue ink.

Question 1 begins on page 4.

Question 2 begins on page 10.

Question 3 begins on page 14.

THIS PAGE MAY BE USED FOR TAKING NOTES AND PLANNING YOUR ANSWERS.

NOTES WRITTEN ON THIS PAGE WILL NOT BE SCORED.

WRITE ALL YOUR RESPONSES ON THE LINED PAGES.

1. L&P Power is a natural monopoly supplying electricity for a city. The firm produces the profit-maximizing quantity of electricity and earns a positive economic profit.

   (a) Describe a condition that distinguishes a natural monopoly from a typical monopoly.

   (b) Draw a correctly labeled graph for the natural monopoly market in which L&P Power operates and show each of the following.

      (i) The profit-maximizing quantity, labeled Q_M

      (ii) The profit-maximizing price, labeled P_M

      (iii) The area representing economic profit, shaded completely

   (c) Suppose the government wants to regulate L&P to produce the maximum quantity that would allow it to earn zero economic profit. On your graph in part (b), show the maximum quantity it will produce to earn zero economic profit, labeled Q_R, and price, labeled P_R.

   (d) Suppose instead the government wants to regulate L&P to produce the allocatively efficient quantity.

      (i) Does L&P earn positive economic profit if it produces the allocatively efficient quantity? Explain.

      (ii) Under what condition will L&P agree to produce the allocatively efficient quantity?

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ANSWER PAGE FOR QUESTION 1

GO ON TO THE NEXT PAGE.

Question 1 is reprinted for your convenience.

1. L&P Power is a natural monopoly supplying electricity for a city. The firm produces the profit-maximizing quantity of electricity and earns a positive economic profit.

   (a) Describe a condition that distinguishes a natural monopoly from a typical monopoly.

   (b) Draw a correctly labeled graph for the natural monopoly market in which L&P Power operates and show each of the following.

      (i) The profit-maximizing quantity, labeled Q_M

      (ii) The profit-maximizing price, labeled P_M

      (iii) The area representing economic profit, shaded completely

   (c) Suppose the government wants to regulate L&P to produce the maximum quantity that would allow it to earn zero economic profit. On your graph in part (b), show the maximum quantity it will produce to earn zero economic profit, labeled Q_R, and price, labeled P_R.

   (d) Suppose instead the government wants to regulate L&P to produce the allocatively efficient quantity.

      (i) Does L&P earn positive economic profit if it produces the allocatively efficient quantity? Explain.

      (ii) Under what condition will L&P agree to produce the allocatively efficient quantity?

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ADDITIONAL PAGE FOR ANSWERING QUESTION 1

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ADDITIONAL PAGE FOR ANSWERING QUESTION 1

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ADDITIONAL PAGE FOR ANSWERING QUESTION 1

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2. A movie theater company obtains the following estimated elasticities of demand.

   - The absolute value of the short-run price elasticity of demand for movie tickets is 0.85.
   - The absolute value of the long-run price elasticity of demand for movie tickets is 3.2.
   - The cross-price elasticity of demand for good X, another product sold by the theater, with respect to the price of movie tickets is – 0.26.
   - The income elasticity of demand for movie tickets is 0.75.

   Answer each of the following by referring to the given elasticities.

   (a) If the theater raises movie ticket prices by 10 percent, by what percentage and in what direction will the quantity demanded for movie tickets change in the short run?

   (b) Explain why the short-run price elasticity of demand for movie tickets differs from the long-run price elasticity of demand for movie tickets.

   (c) What will happen to total revenue from movie ticket sales in the long run if movie ticket prices increase? Explain using the relative percentage changes in price and quantity.

   (d) Are movie tickets a normal good or an inferior good? Explain.

   (e) Given the increase in the price of movie tickets in part (a), what would be the impact on the demand for good X? Use the appropriate graph for good X to illustrate your answer.

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ANSWER PAGE FOR QUESTION 2

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ADDITIONAL PAGE FOR ANSWERING QUESTION 2

GO ON TO THE NEXT PAGE.

ADDITIONAL PAGE FOR ANSWERING QUESTION 2

GO ON TO THE NEXT PAGE.

3. In the small country of AgroIsland, the equilibrium price of wheat is $10 per bushel. Wheat is produced in a competitive industry. The world market price of wheat is $20 per bushel.

   (a) Assume that AgroIsland currently does not engage in international trade in wheat. Draw a correctly labeled graph to illustrate the market for wheat in AgroIsland and indicate the following.

      (i) The equilibrium price, labeled $10

      (ii) The equilibrium quantity, labeled Q*

      (iii) The domestic producer surplus, shaded completely and labeled PS

   (b) On the graph from part (a), show each of the following for AgroIsland if it engages in free trade in the world wheat market.

      (i) The world price of a bushel of wheat, labeled $20

      (ii) The quantity of wheat supplied by domestic producers, labeled Qp

      (iii) The domestic consumer surplus after trade, shaded completely and labeled CS

   (c) Given your answers in part (b), how does each of the following change if AgroIsland engages in international trade in the wheat market?

      (i) The domestic consumer surplus

      (ii) The domestic producer surplus

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ANSWER PAGE FOR QUESTION 3

GO ON TO THE NEXT PAGE.

ADDITIONAL PAGE FOR ANSWERING QUESTION 3

GO ON TO THE NEXT PAGE.

ADDITIONAL PAGE FOR ANSWERING QUESTION 3

GO ON TO THE NEXT PAGE.

STOP

END OF EXAM

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- **MAKE SURE YOU HAVE COMPLETED THE IDENTIFICATION INFORMATION AS REQUESTED ON THE FRONT AND BACK COVERS OF THE SECTION II BOOKLET.**
- **CHECK TO SEE THAT YOUR AP NUMBER LABEL APPEARS IN THE BOX ON THE FRONT COVER.**
- **MAKE SURE YOU HAVE USED THE SAME SET OF AP NUMBER LABELS ON ALL AP EXAMS YOU HAVE TAKEN THIS YEAR.**

Answer Key for AP Micreconomics

Practice Exam, Section I

Question 1: A
Question 2: D
Question 3: E
Question 4: D
Question 5: E
Question 6: E
Question 7: E
Question 8: C
Question 9: A
Question 10: D
Question 11: D
Question 12: D
Question 13: B
Question 14: A
Question 15: C
Question 16: A
Question 17: B
Question 18: A
Question 19: E
Question 20: B
Question 21: C
Question 22: C
Question 23: A
Question 24: A
Question 25: D
Question 26: E
Question 27: C
Question 28: B
Question 29: A
Question 30: C
Question 31: E
Question 32: E
Question 33: C
Question 34: A
Question 35: B
Question 36: B
Question 37: E
Question 38: E
Question 39: A
Question 40: D
Question 41: C
Question 42: E
Question 43: E
Question 44: C
Question 45: C
Question 46: E
Question 47: D
Question 48: B
Question 49: C
Question 50: D
Question 51: C
Question 52: E
Question 53: C
Question 54: E
Question 55: A
Question 56: D
Question 57: D
Question 58: A
Question 59: C
Question 60: D

Multiple-Choice Section for Microeconomics
2019 Course Framework Alignment and Rationales

Question 1

Skill	Learning Objective	Topic
1.A	MKT-1.B	Resource Allocation and Economic Systems

(A)	**Correct**. In a market economy, there is a reliance on signals provided by market prices for the allocation of resources. Private ownership of resources (or well-defined property rights—the right to own and use resources) is an important feature that provides incentives to producers and consumers to respond effectively to economic signals. Thus private ownership of resources is an essential element for markets to function well in allocating resources efficiently.
(B)	Incorrect. In a market economy, the production, distribution, and consumption of goods and services are based on the ownership of resources, and the resulting market distribution of income is not necessarily equitable.
(C)	Incorrect. Income taxes are not unique to a market economy. Other economic systems also have some form of an income tax system, by which governments collect taxes to finance public sector spending.
(D)	Incorrect. In a market economy, buyers and sellers interact through competitive markets to determine what will be produced, who will produce goods and services, and who will consume goods and services. Therefore, in a market system there is primarily a reliance on private goods, not public goods.
(E)	Incorrect. Government-guided resource allocation is a defining characteristic of a command economy, not a market economy. In a market economy, resources are allocated by competitive markets.

Question 2

Skill		Learning Objective	Topic
2.C		MKT-1.C	Production Possibilities Curve
(A)	Incorrect. The opportunity cost increases (not decreases) because as the production of good X increases, the production of good Y decreases by greater amounts. Producing the first 20 units of good X requires giving up 5 units of good Y, producing the next 20 units of good X requires giving up 10 units of good Y, producing the next 20 units of good X requires giving up 20 units of good Y, producing the next 20 units of good X requires giving up 30 units of good Y, and producing the last 20 units of good X requires giving up 35 units of good Y. Thus, the opportunity cost increases (not decreases) as more of X is produced.		
(B)	Incorrect. The opportunity cost increases (not decreases) because as the production of good X increases, the production of good Y decreases by greater amounts (not increases by smaller amounts). Producing the first 20 units of good X requires giving up 5 units of good Y, producing the next 20 units of good X requires giving up 10 units of good Y, producing the next 20 units of good X requires giving up 20 units of good Y, producing the next 20 units of good X requires giving up 30 units of good Y, and producing the last 20 units of good X requires giving up 35 units of good Y. Thus, the opportunity cost increases (not decreases) as more of X is produced.		
(C)	Incorrect. The opportunity cost increases (it does not remain constant) because as the production of good X increases, the production of good Y decreases by greater amounts. Producing the first 20 units of good X requires giving up 5 units of good Y, producing the next 20 units of good X requires giving up 10 units of good Y, producing the next 20 units of good X requires giving up 20 units of good Y, producing the next 20 units of good X requires giving up 30 units of good Y, and producing the last 20 units of good X requires giving up 35 units of good Y. Thus, the opportunity cost increases (it does not remain constant) as more of X is produced.		
(D)	**Correct**. The opportunity cost increases because as the production of good X increases, the production of good Y decreases by greater amounts. Producing the first 20 units of good X requires giving up 5 units of good Y, producing the next 20 units of good X requires giving up 10 units of good Y, producing the next 20 units of good X requires giving up 20 units of good Y, producing the next 20 units of good X requires giving up 30 units of good Y, and producing the last 20 units of good X requires giving up 35 units of good Y. Thus, the opportunity cost increases as more of X is produced.		

Question 2 (continued)

(E)	Incorrect. The opportunity cost increases because as the production of good X increases, the production of good Y decreases by greater amounts (it does not increase by smaller amounts). Producing the first 20 units of good X requires giving up 5 units of good Y, producing the next 20 units of good X requires giving up 10 units of good Y, producing the next 20 units of good X requires giving up 20 units of good Y, producing the next 20 units of good X requires giving up 30 units of good Y, and producing the last 20 units of good X requires giving up 35 units of good Y. Thus, the opportunity cost increases as more of X is produced.

Question 3

Skill	**Learning Objective**	**Topic**
2.A	MKT-4.B	Market Disequilibrium and Changes in Equilibrium

(A)	Incorrect. From the given information it is not possible to determine whether a good is inferior or normal. One needs to know the income elasticity of demand for good Y to determine whether the good is inferior or normal. The income elasticity of demand for an inferior good is negative, implying that as income increases the demand for the good decreases.
(B)	Incorrect. From the given information it is not possible to determine whether a good is a luxury or a necessity good.
(C)	Incorrect. From the given information it is not possible to determine whether a good is inferior or normal. One needs to know the income elasticity of demand for good Y to determine whether the good is inferior or normal. The income elasticity of demand for a normal good is positive, implying that as income increases the demand for the good decreases.
(D)	Incorrect. Goods are complements of one another if a decrease in the price of one good leads to an increase in demand for the other good. An increase in the supply of good X will cause the price of good X to decrease. The result of this change is an increase in the price and quantity of good Y, which would be caused by an increase in the demand for good Y. Therefore, goods X and Y are complements (not substitutes).
(E)	**Correct**. Goods are complements of one another if a decrease in the price of one good leads to an increase in demand for the other good. An increase in the supply of good X will cause the price of good X to decrease. The result of this change is an increase in the price and quantity of good Y, which would be caused by an increase in the demand for good Y. Therefore, goods X and Y are complements.

Question 4

Skill	Learning Objective	Topic
2.A	MKT-3.D	Supply

(A)	Incorrect. An increase in consumer income is a determinant of the demand for apples, not the supply. Therefore, the supply curve will not be affected.
(B)	Incorrect. An increase in the price of apples causes a movement up along the given supply curve (not a shift of the supply curve). The quantity supplied of apples is directly related to the price of apples.
(C)	Incorrect. An increase in the wages of apple pickers will raise the cost of production, causing the supply curve for apples to shift to the left (not to the right).
(D)	**Correct**. A decrease in the rental price for apple harvesting equipment will increase the productivity of workers and lower the cost of production, causing the supply curve for apples to shift to the right.
(E)	Incorrect. A decrease in the demand for oranges lowers the price of oranges. If oranges and apples are substitutes for each other, the decrease in the price of oranges will result in a decrease in the demand for apples, causing the demand curve to shift to the left along the given market supply curve; it does not shift the supply curve.

Question 5

Skill	Learning Objective	Topic
3.A	MKT-3.E	Price Elasticity of Demand

(A)	Incorrect. When demand is elastic, the quantity effect outweighs the price effect; that is, the percentage change in quantity demanded exceeds the percentage change in price. Thus, an increase in price will result in a decrease (not an increase) in total revenue.
(B)	Incorrect. When demand is elastic, the quantity effect outweighs the price effect; that is, the percentage change in quantity demanded exceeds the percentage change in price. Thus, a decrease in price will result in an increase (not a decrease) in total revenue.
(C)	Incorrect. When demand is unit elastic, the quantity effect exactly offsets the price effect; that is, the percentage change in quantity demanded equals the percentage change in price. Thus, a decrease in price will result in no change (not a decrease) in total revenue.
(D)	Incorrect. When demand is inelastic, the price effect outweighs the quantity effect; that is, the percentage change in price exceeds the percentage change in quantity demanded. Thus, a decrease in price will result in a decrease (not an increase) in total revenue.
(E)	**Correct**. When demand is inelastic, the price effect outweighs the quantity effect; that is, the percentage change in price exceeds the percentage change in quantity demanded. Thus, a decrease in price will result in a decrease in total revenue.

Question 6

Skill	Learning Objective	Topic
2.A	CBA-2.A	Marginal Analysis and Consumer Choice

(A)	Incorrect. The response refers to an equilibrium in a market for each good, which maximizes total economic surplus but not the total utility for an individual consumer. Given limited income, a utility-maximizing consumer will choose the quantity of each good such that the marginal utility of the last dollar spent on one good is equal to the marginal utility of the last dollar spent on the other good. That is, the extra utility per dollar spent must be the same for the last unit of each good.
(B)	Incorrect. The response refers to a situation where a consumer will consume each good if the goods were to be offered for free, in which case the consumer would choose the quantity of each good where the marginal utility of the last unit is zero. Given limited income and the prices of the goods, the consumer maximizes utility by choosing the combination of the two goods such that marginal utility of the last dollar spent on one good is equal to the marginal utility of the last dollar spent on the other good. That is, the extra utility per dollar spent must be the same for the last unit of each good.
(C)	Incorrect. Given limited income and the prices of the goods, a consumer maximizes utility by choosing the combination of the two goods such that the marginal utility of the last dollar spent on one good is equal to the marginal utility of the last dollar spent on the other good. That is, the extra utility per dollar spent must be the same for the last unit of each good.
(D)	Incorrect. The response refers to the decision rule a firm would use to determine the profit-maximizing quantity of output. That is, a firm selects the level of output at which marginal revenue equals marginal cost to maximize profit. Given limited income and the prices of the goods, a consumer maximizes utility by choosing the combination of the two goods such that the marginal utility of the last dollar spent on one good is equal to the marginal utility of the last dollar spent on the other good. That is, the extra utility per dollar spent must be the same for the last unit of each good.
(E)	**Correct**. Given limited income and the prices of the goods, a consumer maximizes utility by choosing the combination of the two goods such that the marginal utility of the last dollar spent on one good is equal to the marginal utility of the last dollar spent on the other good. That is, the extra utility per dollar spent must be the same for the last unit of each good.

Question 7

Skill	Learning Objective	Topic
1.A	CBA-2.B	Marginal Analysis and Consumer Choice

(A)	Incorrect. The marginal benefit is the change in total utility (not average utility) that results from one more unit of the good.
(B)	Incorrect. Marginal benefit is not the same as the total benefit (utility). The marginal benefit is the change in total utility that results from one more unit of the good.
(C)	Incorrect. Marginal benefit is a measure of the benefit a consumer derives from consuming each unit of the good; it is not the same as marginal cost. Marginal cost is related to the production of the good, the cost associated with producing one extra unit of the good.
(D)	Incorrect. The response refers to the marginal expenditure, which is the change in total expenditure when the consumer purchases one more unit of the good. The marginal benefit of consuming a good is the change in total utility (not total expenditures) as a result of buying one more unit of the good.
(E)	**Correct**. A consumer's willingness to pay reflects how much the consumer values the good or service. Specifically, the demand curve reflects the marginal value of each unit of the good, which is equal to the maximum amount the consumer is willing to pay for that unit. The marginal value decreases as quantity increases.

Question 8

Skill	Learning Objective	Topic
1.A	MKT-4.A	Market Equilibrium and Consumer and Producer Surplus

(A)	Incorrect. Consumer surplus does not refer to the difference between the quantity purchased and the quantity consumed. Consumer surplus is a measure of the benefit a consumer receives from participating in the market. It is the difference between the maximum price a consumer is willing to pay and the price the consumer actually pays. In the context of the demand curve, consumer surplus is given by the area under the demand curve that is above the price.
(B)	Incorrect. The response refers to the production side of the market. Consumer surplus is a measure of the benefit a consumer receives from the buyer's side of the market. Consumer surplus is the difference between the maximum price a consumer is willing to pay and the price the consumer actually pays. In the context of the demand curve, consumer surplus is given by the area under the demand curve that is above the price.
(C)	**Correct**. Consumer surplus is a measure of the benefit a consumer receives from participating in the market. It is the difference between the maximum price a consumer is willing to pay and the price the consumer actually pays. In the context of the demand curve, consumer surplus is given by the area under the demand curve that is above the price.
(D)	Incorrect. The response refers to the total market surplus, which is the sum of the producer and consumer surpluses. It is not equal to the consumer surplus. The consumer surplus is the difference between the maximum price a consumer is willing to pay and the price the consumer actually pays. In the context of the demand curve, consumer surplus is given by the area under the demand curve that is above the price.
(E)	Incorrect. Consumer surplus does not refer to the difference between the quantity demanded and the quantity supplied. Consumer surplus is a measure of the benefit a consumer receives from participating in the market. It is the difference between the maximum price a consumer is willing to pay and the price the consumer actually pays. In the context of the demand curve, consumer surplus is given by the area under the demand curve that is above the price.

Question 9

Skill	Learning Objective	Topic
2.C	PRD-1.A	Short-Run Production Costs

(A)	**Correct.** The variable cost for the first unit is $\$130 - \$60 = \$70$. The variable cost for the second unit is $\$180 - \$60 = \$120$. Therefore, the marginal cost of producing the second unit is $(\$120 - \$70) / 1 = \$50$.
(B)	Incorrect. The response uses the fixed cost as the marginal cost. The variable cost for the first unit is $\$130 - \$60 = \$70$. The variable cost for the second unit is $\$180 - \$60 = \$120$. Therefore, the marginal cost of producing the second unit is $(\$120 - \$70) / 1 = \$50$.
(C)	Incorrect. The response uses the variable cost, which is also equal to the marginal cost of the first unit. The variable cost for the first unit is $\$130 - \$60 = \$70$. The variable cost for the second unit is $\$180 - \$60 = \$120$. Therefore, the marginal cost of producing the second unit is $(\$120 - \$70) / 1 = \$50$.
(D)	Incorrect. The response uses the average total cost of producing two units as the marginal cost. The variable cost for the first unit is $\$130 - \$60 = \$70$. The variable cost for the second unit is $\$180 - \$60 = \$120$. Therefore, the marginal cost of producing the second unit is $(\$120 - \$70) / 1 = \$50$.
(E)	Incorrect. The response uses the total cost of producing two units as the marginal cost. The variable cost for the first unit is $\$130 - \$60 = \$70$. The variable cost for the second unit is $\$180 - \$60 = \$120$. Therefore, the marginal cost of producing the second unit is $(\$120 - \$70) / 1 = \$50$.

Question 10

Skill	Learning Objective	Topic
2.A	PRD-3.A	Perfect Competition

(A)	Incorrect. The profit-maximizing quantity occurs at the output quantity at which marginal revenue equals marginal cost. The firm depicted in the graph operates in a perfectly competitive market; its price is the same as marginal revenue and equal to the horizontal demand curve. To maximize profit the firm should produce where $MR = MC$, which occurs at Q_3, not zero.
(B)	Incorrect. The profit-maximizing quantity occurs at the output quantity at which marginal revenue equals marginal cost. The firm depicted in the graph operates in a perfectly competitive market; its price is the same as marginal revenue and equal to the horizontal demand curve. To maximize profit the firm should produce where $MR = MC$, which occurs at Q_3, not Q_1.
(C)	Incorrect. The profit-maximizing quantity occurs at the output quantity at which marginal revenue equals marginal cost. The firm depicted in the graph operates in a perfectly competitive market; its price is the same as marginal revenue and equal to the horizontal demand curve. To maximize profit the firm should produce where $MR = MC$, which occurs at Q_3, not Q_2.
(D)	**Correct**. The profit-maximizing quantity occurs at the output quantity at which marginal revenue equals marginal cost. The firm depicted in the graph operates in a perfectly competitive market; its price is the same as marginal revenue and equal to the horizontal demand curve. To maximize profit the firm should produce where $MR = MC$, which occurs at Q_3.
(E)	Incorrect. The profit-maximizing quantity occurs at the output quantity at which marginal revenue equals marginal cost. The firm depicted in the graph operates in a perfectly competitive market; its price is the same as marginal revenue and equal to the horizontal demand curve. To maximize profit the firm should produce where $MR = MC$, which occurs at Q_3, not Q_4.

Question 11

Skill	Learning Objective	Topic
2.C	PRD-1.A	Long-Run Production Costs

(A)	Incorrect. Returns to scale is a long-run concept that describes what happens to output when all inputs are increased or decreased by the same proportion. With constant returns to scale, proportional changes in all inputs result in an equal proportional increase in output. A change of 40 workers, 8 units of capital and 100 units of output is not consistent with constant returns to scale, because the number of workers doubled, the amount of capital remained constant, and output increased to 100. This is a short-run phenomenon in which one input is fixed, in this case, capital.
(B)	Incorrect. Returns to scale is a long-run concept that describes what happens to output when all inputs are increased or decreased by the same proportion. With constant returns to scale, proportional changes in all inputs result in an equal proportional increase in output. A change of 40 workers, 16 units of capital and 90 units of output is not consistent with constant returns to scale, because the number of inputs doubled, and output less than doubled. The situation is known as decreasing returns to scale, not constant returns to scale.
(C)	Incorrect. Returns to scale is a long-run concept that describes what happens to output when all inputs are increased or decreased by the same proportion. With constant returns to scale, proportional changes in all inputs result in an equal proportional increase in output. The response does not show an equal proportional change in the inputs and output, and therefore it is not consistent with constant returns to scale.
(D)	**Correct**. Returns to scale is a long-run concept that describes what happens to output when all inputs are increased or decreased by the same proportion. With constant returns to scale, proportional changes in all inputs result in an equal proportional increase in output. A change of 10 workers, 4 units of capital and 25 units of output is consistent with constant returns to scale, because the amount of inputs changed by 50 percent each (i.e., the number of workers changed by 10 from 20 and the units of capital changed by 4 from 8), and the amount of output also changed by 50 percent (i.e., a change of 25 units of output from 50).
(E)	Incorrect. Returns to scale is a long-run concept that describes what happens to output when all inputs are increased or decreased by the same proportion. With constant returns to scale, proportional changes in all inputs result in an equal proportional increase in output. The response does not show equal proportional changes in the inputs and output, and therefore it is not consistent with constant returns to scale.

Question 12

Skill	Learning Objective	Topic
1.C	PRD-3.C	Oligopoly and Game Theory

(A)	Incorrect. In a perfectly competitive market, there are a large number of firms with each firm accounting for a very small fraction of the total market output. This is inconsistent with the scenario described in the question. In the scenario provided, there are four firms that dominate the market, which is consistent with the characteristics of an oligopoly, not a perfectly competitive market.
(B)	Incorrect. With a pure monopoly, there is only firm, and the monopolist produces the entire market output. This is inconsistent with the scenario described in the question. In the scenario provided, there are four firms that dominate the market, which is consistent with the characteristics of an oligopoly, not a pure monopoly.
(C)	Incorrect. A natural monopoly exists when a single firm can supply the entire market at a lower average total cost than two or more can; the one firm supplies the entire market. This is inconsistent with the scenario described in the question. In the scenario provided, there are four firms that dominate the market, which is consistent with the characteristics of an oligopoly, not a natural monopoly.
(D)	**Correct**. In an oligopoly, there are few firms in the market, and they dominate the market. In the scenario provided, the four largest firms produce 88 percent of total industry output, which is consistent with the characteristics of an oligopoly.
(E)	Incorrect. A monopsony is a market in which there is a single buyer of labor services. The scenario provided describes the output of the industry and does not comment on the input market. In the scenario provided, the four largest firms produce 88% of total industry output, which is consistent with the characteristics of an oligopoly.

Question 13

Skill	Learning Objective	Topic
2.A	PRD-3.B	Monopolistic Competition

(A)	Incorrect. Monopolistic competition is a market structure that consists of many firms producing differentiated products in a market with few or no barriers to entry or exit. Product differentiation (not economies of scale in production) allows each firm to have market power over its differentiated product.
(B)	**Correct**. Monopolistic competition is a market structure that consists of many firms producing differentiated products in a market with few or no barriers to entry or exit. Product differentiation allows each firm to have market power over its differentiated product.
(C)	Incorrect. Monopolistic competition is a market structure that consists of many firms producing differentiated products in a market with few or no barriers to entry or exit. Product differentiation (not the absence of perfectly competitive firms) allows each firm to have market power over its differentiated product.
(D)	Incorrect. Monopolistic competition is a market structure that consists of many firms producing differentiated products in a market with few or no barriers to entry or exit. Product differentiation allows each firm to have market power over its differentiated product.
(E)	Incorrect. Monopolistic competition is a market structure that consists of many firms producing differentiated products in a market with few or no barriers to entry or exit. Product differentiation (not maintaining excess capacity) allows each firm to have market power over its differentiated product.

Question 14

Skill	Learning Objective	Topic
2.C	PRD-4.C	Profit-Maximizing Behavior in Perfectly Competitive Factor Markets

(A)	**Correct**. A firm determines the profit-maximizing quantity of labor by equating the marginal revenue product of labor (MRPL) to the marginal factor cost (MFC), which is equal to the wage rate in a perfectly competitive market. MRPL equals the marginal product of the last worker times the marginal revenue. At the profit-maximizing quantity of labor the MRPL equals the MFC, that is, $(\text{MP} \times \text{MR}) = \text{MFC}$; thus the marginal revenue must be $\$20 / \$10 = \$2$.
(B)	Incorrect. A firm determines the profit-maximizing quantity of labor by equating the marginal revenue product of labor (MRPL) to the marginal factor cost (MFC), which is equal to the wage rate in a perfectly competitive market. MRPL equals the marginal product of the last worker times the marginal revenue. At the profit-maximizing quantity of labor the MRPL equals the MFC, that is, $(\text{MP} \times \text{MR}) = \text{MFC}$; thus the marginal revenue must be $\$20 / \$10 = \$2$ (not $\$20$).
(C)	Incorrect. The marginal revenue is constant if the firm is perfectly competitive (that is, it does not increase as output produced increases). If the firm is imperfectly competitive, its marginal revenue decreases (not increases) as more output is produced and sold.
(D)	Incorrect. The marginal revenue is constant if the firm is perfectly competitive (that is, it does not increase first and then decrease as output produced increases). If the firm is imperfectly competitive, its marginal revenue decreases as more output is produced and sold.
(E)	Incorrect. The marginal revenue is constant if the firm is perfectly competitive (that is, it does not decrease first and then increase as output produced increases). If the firm is imperfectly competitive, its marginal revenue decreases (not increases) as more output is produced and sold.

Question 15

Skill	Learning Objective	Topic
3.A	POL-3.A	Externalities

(A)	Incorrect. The demand curve for the good is completely vertical at the market equilibrium quantity. Even though the production of the good entails an external cost (negative externality), the equilibrium quantity produced is the same as the socially optimal quantity; therefore, there would no deadweight loss.
(B)	Incorrect. The demand curve for the good is completely vertical at the market equilibrium quantity. Even if marginal costs are constant, the quantity produced remains at the market equilibrium, which is socially optimal. There would be no deadweight loss.
(C)	**Correct**. The demand curve for the good is completely vertical at the market equilibrium quantity. Even though the production of the good entails an external cost (negative externality), the equilibrium quantity produced is the same as the socially optimal quantity; therefore, there would be no deadweight loss.
(D)	Incorrect. Even if marginal costs are constant, the quantity produced remains at the market equilibrium, which is socially optimal. There would be no deadweight loss.
(E)	Incorrect. Even if fixed costs are zero, the market equilibrium quantity will not change since the demand curve is perfectly inelastic. Thus, there would be no deadweight loss.

Question 16

Skill	Learning Objective	Topic
1.A	MKT-1.C	Production Possibilities Curve

(A)	**Correct**. A linear production possibilities curve has a constant slope, meaning that the trade-off between the two variables described by the linear function is constant. Therefore, the opportunity cost is constant.
(B)	Incorrect. A linear production possibilities curve has a constant slope, meaning that the trade-off between the two variables described by the linear function is constant. Therefore, the opportunity cost is constant (it does not decrease).
(C)	Incorrect. A linear production possibilities curve has a constant slope, meaning that the trade-off between the two variables described by the linear function is constant. Therefore, the opportunity cost is constant (it does not increase).
(D)	Incorrect. A linear production possibilities curve has a constant slope. As more of one good is produced, the reduction in the production of the other good remains constant (it does not diminish).
(E)	Incorrect. The intensity of a factor input (labor) does not indicate whether the production possibilities curve will be linear. A linear production possibilities curve has a constant slope, and therefore, it indicates that the opportunity cost is constant.

Question 17

Skill	Learning Objective	Topic
3.C	POL-1.A	The Effects of Government Intervention in Markets

(A)	Incorrect. The tax creates a wedge between the price paid by buyers and the price received by sellers. The per-unit tax shifts the supply curve to the left by the amount of the tax, raising the price to \$8 and decreasing the quantity exchanged to 100 units. Thus, the price paid by buyers rises to \$8, and the price received by sellers falls to \$4 (not \$6). The deadweight loss is given by the area of the triangle between the price of \$8 and \$4 and the quantity of 100 units and 200 units. That is, the deadweight loss is equal to $((\$8 - \$4) \times (200 - 100)) / 2 = \$200$, not \$100.
(B)	**Correct**. The tax creates a wedge between the price paid by buyers and the price received by sellers. The per-unit tax shifts the supply curve to the left by the amount of the tax, raising the price to \$8 and decreasing the quantity exchanged to 100 units. Thus, the price paid by buyers rises to \$8, and the price received by sellers falls to \$4. The deadweight loss is given by the area of the triangle between the price of \$8 and \$4 and the quantity of 100 units and 200 units. That is, the deadweight loss is equal to $((\$8 - \$4) \times (200 - 100)) / 2 = \$200$.
(C)	Incorrect. The tax creates a wedge between the price paid by buyers and the price received by sellers. The per-unit tax shifts the supply curve to the left by the amount of the tax, raising the price to \$8 and decreasing the quantity exchanged to 100 units. Thus, the price paid by buyers rises to \$8 not \$6), and the price received by sellers falls to \$4 (not \$6). The deadweight loss is given by the area of the triangle between the price of \$8 and \$4 and the quantity of 100 units and 200 units. That is, the deadweight loss is equal to $((\$8 - \$4) \times (200 - 100)) / 2 = \$200$, not \$0.
(D)	Incorrect. The tax creates a wedge between the price paid by buyers and the price received by sellers. The per-unit tax shifts the supply curve to the left by the amount of the tax, raising the price to \$8 and decreasing the quantity exchanged to 100 units. Thus, the price paid by buyers rises to \$8 (not \$4), and the price received by sellers falls to \$4 (not \$8). The deadweight loss is given by the area of the triangle between the price of \$8 and \$4 and the quantity of 100 units and 200 units. That is, the deadweight loss is equal to $((\$8 - \$4) \times (200 - 100)) / 2 = \$200$, not \$100.

Question 17 (continued)

(E)	Incorrect. The tax creates a wedge between the price paid by buyers and the price received by sellers. The per-unit tax shifts the supply curve to the left by the amount of the tax, raising the price to \$8 and decreasing the quantity exchanged to 100 units. Thus, the price paid by buyers rises to \$8 (not \$4), and the price received by sellers falls to \$4 (not \$8). The deadweight loss is given by the area of the triangle between the price of \$8 and \$4 and the quantity of 100 units and 200 units. That is, the deadweight loss is equal to $((\$8 - \$4) \times (200 - 100)) / 2 = \$200$.

Question 18

Skill	**Learning Objective**	**Topic**
2.C	PRD-1.A	Short-Run Production Costs

(A)	**Correct**. When ATC is greater than MC, the marginal cost is rising and the ATC is falling with increases in output. Producing one less unit of output raises ATC; therefore, the ATC of producing the ninth unit is greater than \$150.
(B)	Incorrect. When ATC is greater than MC, the marginal cost is rising and the ATC is falling with increases in output. Producing one less unit of output raises ATC; therefore, the ATC of producing the ninth unit is greater than \$150 (not less than \$150).
(C)	Incorrect. When ATC is greater than MC, the marginal cost is rising and the ATC is falling with increases in output. Producing one less unit of output lowers the MC (not raises it); thus the MC of producing the ninth unit is less than \$130 (not greater).
(D)	Incorrect. The average variable cost (AVC) is less than the ATC at all output levels. Therefore, the AVC of producing the tenth unit is less than \$150 (not greater than \$150).
(E)	Incorrect. From the given information it is not possible to determine the value of the AVC as \$20 However, given the ATC is \$150 and the MC is \$130 the AVC is less than the ATC, but not as low as \$20.

Question 19

Skill	Learning Objective	Topic
3.A	MKT-3.A	Demand

(A)	Incorrect. The substitution effect is one of the factors that explains why the demand curve slopes downward. It explains a movement down along the demand curve for a normal good when the price of the good increases, not a shift of the demand curve.
(B)	Incorrect. The substitution effect is one of the factors that explains why the demand curve slopes downward. It explains a movement down along the demand curve for a normal good when the price of the good increases, not a change in the demand for a complementary good.
(C)	Incorrect. The substitution effect is one of the factors that explains why the demand curve slopes downward. It explains a movement down along the demand curve for a normal good when the price of the good increases. It is not a price change that makes the demand for a good more elastic.
(D)	Incorrect. When the price of a normal good increases, the demand for the substitute good increases, which is a shift of the demand curve, not a movement down along the demand curve for the good whose price has increased.
(E)	**Correct**. The substitution effect is one of the factors that explains why the demand curve slopes downward. It explains a movement down along the demand curve for a normal good when the price of the good increases. When the price of a normal good increases, buyers will substitute the higher-priced good for a lesser-priced substitute, and therefore buyers will decrease the quantity demanded of the good whose price has increased.

Question 20

Skill	Learning Objective	Topic
2.C	PRD-1.A	The Production Function

(A)	Incorrect. The marginal product of the first worker is 10, of the second worker is 15, of the third worker is 10, and so on. The marginal product begins to decline with the third worker. The maximum number of workers the firm can hire before diminishing returns set in is 2, not 1.
(B)	**Correct**. The marginal product of the first worker is 10, of the second worker is 15, of the third worker is 10, and so on. The marginal product begins to decline with the third worker. The maximum number of workers the firm can hire before diminishing returns set in is 2.
(C)	Incorrect. The marginal product of the first worker is 10, of the second worker is 15, of the third worker is 10, and so on. The marginal product begins to decline with the third worker. The maximum number of workers the firm can hire before diminishing returns set in is 2, not 3.
(D)	Incorrect. The marginal product of the first worker is 10, of the second worker is 15, of the third worker is 10, and so on. The marginal product begins to decline with the third worker. The maximum number of workers the firm can hire before diminishing returns set in is 2, not 4.
(E)	Incorrect. The marginal product of the first worker is 10, of the second worker is 15, of the third worker is 10, and so on. The marginal product begins to decline with the third worker. The maximum number of workers the firm can hire before diminishing returns set in is 2, not 5.

Question 21

Skill		Learning Objective	Topic
2.A		PRD-3.B	Monopoly
(A)	Incorrect. The profit-maximizing output Q_1 occurs where MC = MR, and the price P_4 (not P_1) is above Q_1 on the demand curve. Economic profit is given by the area P_2P_4IM (not $0P_1LQ_1$).		
(B)	Incorrect. The profit-maximizing output Q_1 occurs where MC = MR, and the price P_4 is above Q_1 on the demand curve. Economic profit is given by the area P_2P_4IM (not P_1P_4IL).		
(C)	**Correct**. The profit-maximizing output Q_1 occurs where MC = MR, and the price P_4 is above Q_1 on the demand curve. Economic profit is given by the area P_2P_4IM.		
(D)	Incorrect. The profit-maximizing output Q_1 (not Q_2) occurs where MC = MR, and the price P_4 (not P_3) is above Q_1 on the demand curve. Economic profit is given by the area P_2P_4IM (not P_2P_3NM).		
(E)	Incorrect. The profit-maximizing output Q_1 (not Q_3) occurs where MC = MR, and the price P_4 (not P_1) is above Q_1 on the demand curve. Economic profit is given by the area P_2P_4IM (not P_1P_2ML).		

Question 22

Skill	Learning Objective	Topic
1.C	PRD-3.C	Oligopoly and Game Theory

(A)	Incorrect. The dominant strategy for *Daily Voice* is to Increase Subscription Price (rather than Do Not Change Subscription Price). If *Town Herald* selects Do Not Change Subscription Price, *Daily Voice* does best by also selecting to Increase Subscription Price ($600 > $500). If *Town Herald* chooses to Increase Subscription Price, *Daily Voice* does best by also selecting to Increase Subscription Price ($300 > $200). Therefore, Increase Subscription Price is a dominant strategy for *Daily Voice*.
(B)	Incorrect. *Town Herald* does not have a dominant strategy. Its best strategy depends on the strategy chosen by *Daily Voice*. If *Daily Voice* chooses Do Not Change Subscription Price, *Town Herald* does best by choosing to Increase Subscription Price ($700 > $400). If *Daily Voice* chooses Increase Subscription Price, *Town Herald* does best by choosing Do Not Change Subscription Price ($300 > $100).
(C)	**Correct**. If *Town Herald* selects Do Not Change Subscription Price, *Daily Voice* does best by selecting to Increase Subscription Price ($600 > $500). If *Town Herald* chooses to Increase Subscription Price, *Daily Voice* does best by also selecting to Increase Subscription Price ($300 > $200). Therefore, Increase Subscription Price is a dominant strategy for *Daily Voice*.
(D)	Incorrect. *Town Herald* does not have a dominant strategy. Its best strategy depends on the strategy chosen by *Daily Voice*. If *Daily Voice* chooses Do Not Change Subscription Price, *Town Herald* does best by choosing to Increase Subscription Price ($700 > $400). If *Daily Voice* chooses Increase Subscription Price, *Town Herald* does best by choosing Do Not Change Subscription Price ($300 > $100).
(E)	Incorrect. *Daily Voice* has a dominant strategy to Increase Subscription Price. If *Town Herald* selects Do Not Change Subscription Price, *Daily Voice* does best by selecting to Increase Subscription Price ($600 > $500). If *Town Herald* chooses to Increase Subscription Price, *Daily Voice* does best by also selecting to Increase Subscription Price ($300 > $200). Therefore, Increase Subscription Price is a dominant strategy for *Daily Voice*. *Town Herald* has no dominant strategy; its best strategy depends on the strategy chosen by *Daily Voice*.

Question 23

Skill	Learning Objective	Topic
1.A	PRD-3.B	Price Discrimination

(A)	**Correct**. Under perfect price discrimination, a firm charges each consumer the maximum price the consumer is willing to pay. By doing so, the firm can increase its profit more than it can by selling the good for a single price.
(B)	Incorrect. Under perfect price discrimination, a firm charges each consumer the maximum price the consumer is willing to pay (not a price equal to the average cost of the product). By doing so, the firm can increase its profit more than it can by selling the good for a single price.
(C)	Incorrect. Under perfect price discrimination, a firm charges each consumer the maximum price the consumer is willing to pay (not the lowest price the customer is willing to pay). By doing so, the firm can increase its profit more than it can by selling the good for a single price.
(D)	Incorrect. Under perfect price discrimination, a firm charges each consumer the maximum price the consumer is willing to pay. The price the firm charges is based on willingness to pay, not other characteristics such as age, elasticity of demand, location, etc. to differentiate buyers into different subgroups. That type of price setting is not perfect price discrimination.
(E)	Incorrect. Under perfect price discrimination, a firm charges each consumer the maximum price the consumer is willing to pay, and does not set prices on the basis of other factors that can be used to group buyers into two or more subgroups. Such grouping of buyers leads to a different form of price discrimination, but not perfect price discrimination.

Question 24

Skill	Learning Objective	Topic
2.C	PRD-2.A	Firms' Short-Run Decisions to Produce and Long-Run Decisions to Enter or Exit a Market

(A)	**Correct**. The firm currently produces the 100 units where marginal cost equals marginal revenue. The price, $6, is less than the average variable cost. By continuing to operate, the firm incurs a loss greater than its fixed cost. Therefore, the firm will shut down in the short run to minimize its losses.
(B)	Incorrect. Producing less than 100 units will cause the firm to move away from the profit-maximizing or loss-minimizing level of output. Doing so will raise the average variable cost higher than $7, making the losses worse. Producing less output is not a viable option for the firm.
(C)	Incorrect. Producing more than 100 units will cause the firm to move away from the profit-maximizing or loss-minimizing level of output. Doing so will raise both the average variable cost and the marginal cost, making the losses worse. Producing more output is not a viable option for the firm.
(D)	Incorrect. Continuing to produce 100 units of output is unsustainable for the firm because the loss it is incurring is greater than its fixed cost. It should shut down to minimize its losses.
(E)	Incorrect. The firm operates in a perfectly competitive market. The firm has no ability to change the market price because it is a price taker. Raising the price is not an option for the firm.

Question 25

Skill	Learning Objective	Topic
1.C	PRD-1.A	The Production Function

(A)	Incorrect. The response indicates the marginal product of the sixth worker, not the third worker. The marginal product of the third worker is 24 units. The quantity of output with two workers is 30 units; the output increases to 54 when the third worker is added. Therefore, the marginal product of the third worker is $(54-30)/(3-2)=24$ units.
(B)	Incorrect. The response indicates the marginal product of the first worker, not the third worker. The marginal product of the third worker is 24 units. The quantity of output with two workers is 30 units; the output increases to 54 when the third worker is added. Therefore, the marginal product of the third worker is $(54-30)/(3-2)=24$ units.
(C)	Incorrect. The response indicates the marginal product of the second worker, not the third worker. The marginal product of the third worker is 24 units. The quantity of output with two workers is 30 units; the output increases to 54 when the third worker is added. Therefore, the marginal product of the third worker is $(54-30)/(3-2)=24$ units.
(D)	**Correct**. The marginal product of the third worker is 24 units. The quantity of output with two workers is 30 units; the output increases to 54 when the third worker is added. Therefore, the marginal product of the third worker is $(54-30)/(3-2)=24$ units.
(E)	Incorrect. There is sufficient information to determine the marginal product of the third worker. The marginal product of the third worker is 24 units. The quantity of output with two workers is 30 units; the output increases to 54 when the third worker is added. Therefore, the marginal product of the third worker is $(54-30)/(3-2)=24$ units.

Question 26

Skill	Learning Objective	Topic
2.C	PRD-4.C	Profit-Maximizing Behavior in Perfectly Competitive Factor Markets

(A)	Incorrect. The firm will not shut down if the price is \$10 because there are several units of output at which the value of the marginal product (the marginal revenue product) exceeds the marginal factor cost of \$100, which is equal to the wage rate per day.
(B)	Incorrect. For the first and second unit of labor the marginal product is rising, and a profit-maximizing firm will not stop producing in a region of increasing marginal returns when marginal product is rising; it should continue to increase production to the region where diminishing returns are observed.
(C)	Incorrect. For the first and second unit of labor the marginal product is rising, and a profit-maximizing firm will not stop producing in a region of increasing marginal returns when marginal product is rising; it should continue to increase production to the region where diminishing returns are observed.
(D)	Incorrect. To produce 54 units of output the firm uses 3 workers, with the marginal product of the third worker being 24 units. The value of the marginal product of labor $(\$10 \times 24) = \$240$ exceeds the marginal factor cost, \$100. To maximize profit the firm should continue to increase output until the value of the marginal product (marginal revenue product) equals the marginal factor cost, which occurs when the firm produces 85 units and the price is \$10.
(E)	**Correct**. If the firm produces 85 units and sells at \$10, the marginal product of the fifth worker is 10 units. The value of the marginal product of labor (marginal revenue product) equals the marginal factor cost. That is, $(\$10 \times 10) = \$100$, which is equal to the marginal factor cost of \$100. Thus, profit is maximized.

Question 27

Skill	Learning Objective	Topic
1.C	PRD-4.C	Profit-Maximizing Behavior in Perfectly Competitive Factor Markets

(A)	Incorrect. The marginal revenue product of labor (MRPL) is defined as the marginal product of labor (MPL) times marginal revenue (MR). The MRPL of the fourth hour of labor is equal to $7 \times \$2 = \$14$ (not \$4).
(B)	Incorrect. The marginal revenue product of labor (MRPL) is defined as the marginal product of labor (MPL) times marginal revenue (MR). The MRPL of the fourth hour of labor is equal to $7 \times \$2 = \$14$ (not \$7).
(C)	**Correct**. The marginal revenue product of labor (MRPL) is defined as the marginal product of labor (MPL) times marginal revenue (MR). The MRPL of the fourth hour of labor is equal to $7 \times \$2 = \$14$.
(D)	Incorrect. The marginal revenue product of labor (MRPL) is defined as the marginal product of labor (MPL) times marginal revenue (MR). The MRPL of the fourth hour of labor is equal to $7 \times \$2 = \$14$ (not \$26).
(E)	Incorrect. The marginal revenue product of labor (MRPL) is defined as the marginal product of labor (MPL) times marginal revenue (MR). The MRPL of the fourth hour of labor is equal to $7 \times \$2 = \$14$ (not \$70).

Question 28

Skill	Learning Objective	Topic
2.C	CBA-2.B	Marginal Analysis and Consumer Choice

(A)	Incorrect. The total cost is rising with cleaning up pollution, while the total benefit is decreasing. Cleanup efforts should be undertaken as long as the marginal benefit of additional cleanup exceeds the marginal cost. At level 1, the marginal benefit of cleanup ($45) exceeds the marginal cost ($7), but at level 2, the marginal benefit of cleanup ($35) also exceeds the marginal cost ($30), so cleanup should proceed to level 2. Beginning with the third level of cleanup, the marginal cost ($55) exceeds the marginal benefit ($25). Thus, the optimal level is 2.
(B)	**Correct**. The total cost is rising with cleaning up pollution, while the total benefit is decreasing. Clean up efforts should be undertaken as long as the marginal benefit of additional cleanup exceeds the marginal cost. The optimal level of cleanup is 2 because the marginal benefit of the second cleanup ($35) exceeds the marginal cost ($30) Beginning with the third level of cleanup, the marginal cost ($55) exceeds the marginal benefit ($25). Thus, the optimal level is 2.
(C)	Incorrect. The total cost is rising with cleaning up pollution, while the total benefit is decreasing. Cleanup efforts should be undertaken as long as the marginal benefit of additional cleanup exceeds the marginal cost. The optimal level of cleanup is 2 because the marginal benefit of the second cleanup ($35) exceeds the marginal cost ($30) Beginning with the third level of cleanup the marginal cost ($55) exceeds the marginal benefit ($25).
(D)	Incorrect. The total cost is rising with cleaning up pollution, while the total benefit is decreasing. Cleanup efforts should be undertaken as long as the marginal benefit of additional cleanup exceeds the marginal cost. The optimal level of cleanup is 2 because the marginal benefit of the second cleanup ($35) exceeds the marginal cost ($30) Beginning with the third level of cleanup the marginal cost ($55) exceeds the marginal benefit ($25).
(E)	Incorrect. The total cost is rising with cleaning up pollution, while the total benefit is decreasing. Cleanup efforts should be undertaken as long as the marginal benefit of additional cleanup exceeds the marginal cost. The optimal level of cleanup is 2 because the marginal benefit of the second cleanup ($35) exceeds the marginal cost ($30) Beginning with the third level of cleanup the marginal cost ($55) exceeds the marginal benefit ($25).

Question 29

Skill	Learning Objective	Topic
1.A	POL-5.A	Inequality

(A)	**Correct**. The Lorenz curve approach typically divides the population into 5 equal-size groups based on income from the lowest to the highest and computes the income share of each 20 percent of the population each year on a cumulative basis. Thus, the Lorenz curve provides an explicit measure of the percentage of income received by different percentages of the population.
(B)	Incorrect. The Lorenz curve approach typically divides the population into 5 equal-size groups based on income from the lowest to the highest and computes the income share of each 20 percent of the population each year on a cumulative basis. The Lorenz curve shows the distribution of income, not income tax rates and income tax revenues.
(C)	Incorrect. The Lorenz curve approach typically divides the population into 5 equal-size groups based on income from the lowest to the highest and computes the income share of each 20 percent of the population each year on a cumulative basis. The Lorenz curve shows the distribution of income, not child labor rates and the poverty levels.
(D)	Incorrect. The Lorenz curve approach typically divides the population into 5 equal-size groups based on income from the lowest to the highest and computes the income share of each 20 percent of the population each year on a cumulative basis. The Lorenz curve shows the distribution of income, not income inequality and education level.
(E)	Incorrect. The Lorenz curve approach typically divides the population into 5 equal-size groups based on income from the lowest to the highest and computes the income share of each 20 percent of the population each year on a cumulative basis. The Lorenz curve shows the distribution of income, not market structure and the number of firms in the market.

Question 30

Skill	Learning Objective	Topic
2.A	POL-4.A	The Effects of Government Intervention in Different Market Structures

(A)	Incorrect. Antitrust laws are intended to promote competition and to restrain anticompetitive behavior, not to eliminate monopolies altogether.
(B)	Incorrect. Antitrust laws are intended to promote competition and to restrain anticompetitive behavior, not to prevent monopolies from generating negative externalities.
(C)	**Correct**. Antitrust laws are intended to promote competition and to restrain anticompetitive behavior. They do so by limiting practices that increase a firm's market power through regulation.
(D)	Incorrect. Antitrust laws are intended to promote competition and to restrain anticompetitive behavior by limiting practices that increase a firm's market power through regulation, not by imposing price ceilings.
(E)	Incorrect. Antitrust laws are intended to promote competition and to restrain anticompetitive behavior by limiting practices that increase a firm's market power through regulation, not by making charging a price above marginal cost illegal.

Question 31

Skill	Learning Objective	Topic
2.C	MKT-2.A	Comparative Advantage and Trade

(A)	Incorrect. Absolute advantage refers to the productivity of resources between two individuals or countries in performing an activity or producing a good or service. It is not possible to determine absolute advantage from the given information.
(B)	Incorrect. Comparative advantage is determined by differences in opportunity costs in performing a particular task or producing a product or service. Country Y has a comparative advantage in producing oranges, but Country X has a comparative advantage in producing apples. As long as the two countries have differences in opportunity costs it is impossible for one country to have a comparative advantage in both goods.
(C)	Incorrect. Absolute advantage refers to the productivity of resources between two individuals or countries in performing an activity or producing a good or service. It is not possible to determine absolute advantage from the given information.
(D)	Incorrect. Country Y, not Country X, has a comparative advantage in producing oranges. Comparative advantage is determined by differences in opportunity costs in performing a particular task or producing a product or service. The opportunity cost of producing 1 ton of oranges is 1 ton of apples in Country X and 0.5 ton of apples in Country Y. Country Y has a lower opportunity cost than Country X in producing oranges. Therefore, Country Y has a comparative advantage in producing oranges.
(E)	**Correct**. Comparative advantage is determined by differences in opportunity costs in performing a particular task or producing a product or service. The opportunity cost of producing 1 ton of apples is 1 ton of oranges in Country X and 2 tons of oranges in Country Y. Country X has a lower opportunity cost than Country Y in producing apples. Therefore, Country X has a comparative advantage in producing apples.

Question 32

Skill	Learning Objective	Topic
3.C	MKT-3.E	Price Elasticity of Supply

(A)	Incorrect. The price elasticity of supply is defined as the percentage change in the quantity supplied of a good divided by the percentage change in the price of the good. Given the value for the elasticity and the percentage change in the price, the resulting percentage change in the quantity supplied can be determined as follows: percentage change in quantity supplied = (elasticity of supply × the percentage change in price) = $(2 \times 10\%) = 20\%$.
(B)	Incorrect. The price elasticity of supply is defined as the percentage change in the quantity supplied of a good divided by the percentage change in the price of the good. Given the value for the elasticity and the percentage change in the price, the resulting percentage change in the quantity supplied can be determined as follows: percentage change in quantity supplied = (elasticity of supply × the percentage change in price) = $(2 \times 10\%) = 20\%$.
(C)	Incorrect. The price elasticity of supply is defined as the percentage change in the quantity supplied of a good divided by the percentage change in the price of the good. Given the value for the elasticity and the percentage change in the price, the resulting percentage change in the quantity supplied can be determined as follows: percentage change in quantity supplied = (elasticity of supply × the percentage change in price) = $(2 \times 10\%) = 20\%$.
(D)	Incorrect. The price elasticity of supply is defined as the percentage change in the quantity supplied of a good divided by the percentage change in the price of the good. Given the value for the elasticity and the percentage change in the price, the resulting percentage change in the quantity supplied can be determined as follows: percentage change in quantity supplied = (elasticity of supply × the percentage change in price) = $(2 \times 10\%) = 20\%$.
(E)	**Correct**. The price elasticity of supply is defined as the percentage change in the quantity supplied of a good divided by the percentage change in the price of the good. Given the value for the elasticity and the percentage change in the price, the resulting percentage change in the quantity supplied can be determined as follows: percentage change in quantity supplied = (elasticity of supply × the percentage change in price) = $(2 \times 10\%) = 20\%$.

Question 33

Skill		Learning Objective	Topic
2.C		MKT-3.E	Other Elasticities
(A)	Incorrect. The cross-price elasticity between good X and Y $(CRXY)$ can be calculated as the ratio of the percentage change in the quantity of good Y to the percentage change in the price of good X. Thus, $CRXY = (-20\%/10\%) = -2$ (not -0.5).		
(B)	Incorrect. The cross-price elasticity between good X and Y $(CRXY)$ can be calculated as the ratio of the percentage change in the quantity of good Y to the percentage change in the price of good X. Thus, $CRXY = (-20\%/10\%) = -2$ (not $+2$).		
(C)	**Correct**. The cross-price elasticity between good X and Y $(CRXY)$ can be calculated as the ratio of the percentage change in the quantity of good Y to the percentage change in the price of good X. Thus, $CRXY = (-20\%/10\%) = -2$. The cross-price elasticity between good X and good Y is negative implying that X and Y are complementary goods.		
(D)	Incorrect. There is no information given in the question to calculate the income elasticity or to determine whether X and Y are normal goods.		
(E)	Incorrect. The cross-price elasticity between good X and Y $(CRXY)$ can be calculated as the ratio of the percentage change in the quantity of good Y to the percentage change in the price of good X. Thus, $CRXY = (-20\%/10\%) = -2$. The cross-price elasticity between good X and good Y is negative implying that X and Y are complementary goods (not substitute goods).		

Question 34

Skill	Learning Objective	Topic
2.A	MKT-4.B	Market Disequilibrium and Changes in Equilibrium

(A)	**Correct**. Two goods are substitutes if an increase in the price of one increases the demand for the other. In this situation, the increase in the price of strawberries will cause an increase in the demand for blueberries, shifting the demand curve to the right. The result will be a higher equilibrium price and quantity in the blueberry market.
(B)	Incorrect. An increase in the supply of strawberries shifts the supply curve to the right, resulting in a decrease in the equilibrium price (not an increase in the equilibrium price) and an increase in the quantity.
(C)	Incorrect. An increase in the price of farmland used to grow blueberries raises the cost of growing strawberries, causing a leftward shift of the supply curve. The result will be a higher equilibrium price and lower equilibrium quantity (not a higher equilibrium quantity).
(D)	Incorrect. A decrease in the price of blueberry harvesting equipment lowers the cost of producing strawberries and causes a rightward shift of the supply curve, resulting in a decrease in equilibrium price (not an increase in the equilibrium price) and an increase in equilibrium quantity.
(E)	Incorrect. An imposition of a price floor in the market for blueberries causes a movement along the given supply curve. If the price floor is binding, it will result in an increase in the quantity supplied and in a decrease in quantity demanded. The result will be a surplus of blueberries.

Question 35

Skill	Learning Objective	Topic
2.C	CBA-2.A	Marginal Analysis and Consumer Choice

(A)	Incorrect. Given his limited budget, Kyle should consume the combination of video games and comic books such that the marginal utility (MU) of the last dollar spent on video games is equal to the MU of the last dollar spent on comic books. The MU per dollar spent on comic books (50 / $10) is greater than the MU per dollar spent on video games (50 / $25). Therefore, to maximize his utility, Kyle should have bought more (not fewer) comic books and fewer (not more) video games.
(B)	**Correct**. Given his limited budget, Kyle should consume the combination of video games and comic books such that the marginal utility (MU) of the last dollar spent on video games is equal to the MU of the last dollar spent on comic books. The MU per dollar spent on comic books (50 / $10) is greater than the MU per dollar spent on video games (50 / $25). Therefore, to maximize his utility, Kyle should have bought more comic books and fewer video games.
(C)	Incorrect. Given his limited budget, Kyle should consume the combination of video games and comic books such that the marginal utility (MU) of the last dollar spent on video games is equal to the MU of the last dollar spent on comic books. The MU per dollar spent on comic books (50 / $10) is greater than the MU per dollar spent on video games (50 / $25). Therefore, to maximize his utility, Kyle should have bought more (not fewer) comic books and fewer (not more) video games.
(D)	Incorrect. Given his limited budget, Kyle should consume the combination of video games and comic books such that the marginal utility (MU) of the last dollar spent on video games is equal to the MU of the last dollar spent on comic books. The MU per dollar spent on comic books (50 / $10) is greater than the MU per dollar spent on video games (50 / $25). Therefore, to maximize his utility, Kyle should have bought more (not fewer) comic books and fewer (not more) video games.
(E)	Incorrect. Given his limited budget, Kyle should consume the combination of video games and comic books such that the marginal utility (MU) of the last dollar spent on video games is equal to the MU of the last dollar spent on comic books. The MU per dollar spent on comic books (50 / $10) is greater than the MU per dollar spent on video games (50 / $25). Therefore, to maximize his utility, Kyle should have bought more comic books and fewer video games (not more of both goods). In addition, given his limited budget, it would not be possible for Kyle to buy more of both goods.

Question 36

Skill	Learning Objective	Topic
2.C	PRD-4.C	Profit-Maximizing Behavior in Perfectly Competitive Factor Markets

(A)	Incorrect. To minimize its costs or maximize its profits, a firm should use the combination of labor and capital such that the last dollar spent on each input yields the same amount of marginal product. From the given data, the marginal product of the last dollar spent on labor $(8 / \$40)$ is greater than the marginal product of the last dollar spent on capital $(10 / \$100)$. Therefore, the firm can produce more than 1,000 units of output by using more labor and less capital. The firm is not maximizing its profit at the current output.
(B)	**Correct**. To minimize its costs, a firm should use the combination of labor and capital such that the marginal product of the last dollar spent on labor is equal to the marginal product of the last dollar spent on capital. From the given data, the marginal product of the last dollar spent on labor $(8 / \$40)$ is greater than the marginal product of the last dollar spent on capital $(10 / \$100)$. Therefore, the firm can produce more than 1,000 units of output by using more labor and less capital.
(C)	Incorrect. To minimize its costs, a firm should use the combination of labor and capital such that the marginal product of the last dollar spent on labor is equal to the marginal product of the last dollar spent on capital. From the given data, the marginal product of the last dollar spent on labor $(8 / \$40)$ is greater than the marginal product of the last dollar spent on capital $(10 / \$100)$. Therefore, the firm can produce more than 1,000 units of output by using more labor (not less labor) and less capital (not more capital).
(D)	Incorrect. To minimize its costs, a firm should use the combination of labor and capital such that the marginal product of the last dollar spent on labor is equal to the marginal product of the last dollar spent on capital. From the given data, the marginal product of the last dollar spent on labor $(8 / \$40)$ is greater than the marginal product of the last dollar spent on capital $(10 / \$100)$. Therefore, the firm can produce more than 1,000 units of output by using more labor (not the same amount of labor) and less capital.
(E)	Incorrect. To minimize its costs, a firm should use the combination of labor and capital such that the marginal product of the last dollar spent on labor is equal to the marginal product of the last dollar spent on capital. From the given data, the marginal product of the last dollar spent on labor $(8 / \$40)$ is greater than the marginal product of the last dollar spent on capital $(10 / \$100)$. Therefore, the firm can produce more than 1,000 units of output by using more labor (not less labor) and less capital (not the same amount of capital).

Question 37

Skill	Learning Objective	Topic
2.A	PRD-3.C	Oligopoly and Game Theory

(A)	Incorrect. One firm having a dominant strategy does not preclude the other firm from having a dominant strategy.
(B)	Incorrect. If one firm has a dominant strategy, it does not mean the other firm should also have a dominant strategy. It is possible for both firms to have a dominant strategy, or neither firm to have a dominant strategy.
(C)	Incorrect. It is not necessarily required for both firms to have a dominant strategy; one, both, or neither could have a dominant strategy.
(D)	Incorrect. One firm having a dominant strategy does not preclude the existence of a Nash equilibrium. There will be a Nash equilibrium.
(E)	**Correct**. If both firms have a dominant strategy, there will necessarily be a Nash equilibrium.

Question 38

Skill	Learning Objective	Topic
2.A	PRD-3.B	Monopoly

(A)	Incorrect. Elasticity varies moving down along the monopolist's demand curve from elastic to inelastic. If the monopolist increases the price, its total revenue will decrease (not increase) because the percentage decrease in output outweighs the percentage change in price. Therefore, raising the price will decrease total revenue.
(B)	Incorrect. Reducing the output relative to the profit-maximizing output increases (not decreases) average total cost.
(C)	Incorrect. A monopolist's marginal revenue curve lies below its demand curve, and price is greater than marginal revenue, not equal to marginal revenue.
(D)	Incorrect. A profit-maximizing monopolist produces output where marginal revenue equals marginal cost. If marginal revenue is less than marginal cost, the monopolist can increase output to increase profit.
(E)	**Correct**. Marginal revenue decreases with output but is positive in the elastic portion of the demand curve. That is, as price decreases, total revenue increases by smaller and smaller amounts and reaches a maximum when marginal revenue is zero and demand becomes unit elastic.

Question 39

Skill	Learning Objective	Topic
2.A	PRD-3.B	Monopoly

(A)	**Correct**. The monopolist's profit-maximizing output is determined by equating marginal revenue to marginal cost. In the graph provided, marginal revenue equals marginal cost at Q_1 and the price is on the demand curve at P_3. However, at Q_1 the profit-maximizing price is less than both the ATC and the AVC. Therefore, the firm will minimize its losses by shutting down in the short run and exiting the market in the long run if conditions do not change. Thus, the profit-maximizing output in the short run is zero since the firm will shut down.
(B)	Incorrect. The monopolist's profit-maximizing output is determined by equating marginal revenue to marginal cost. In the graph provided, marginal revenue equals marginal cost at Q_1 and the price is on the demand curve at P_3. However, at Q_1 the profit-maximizing price is less than both the ATC and the AVC. Therefore, the firm will minimize its losses by shutting down in the short run and exiting the market in the long run if conditions do not change. Thus, the profit-maximizing output in the short run is zero, not Q_1, since the firm will shut down.
(C)	Incorrect. The monopolist's profit-maximizing output is determined by equating marginal revenue to marginal cost. In the graph provided, marginal revenue equals marginal cost at Q_1 and the price is on the demand curve at P_3. However, at Q_1 the profit-maximizing price is less than both the ATC and the AVC. Therefore, the firm will minimize its losses by shutting down in the short run and exiting the market in the long run if conditions do not change. Thus, the profit-maximizing output in the short run is zero, not Q_2, since the firm will shut down.
(D)	Incorrect. The monopolist's profit-maximizing output is determined by equating marginal revenue to marginal cost. In the graph provided, marginal revenue equals marginal cost at Q_1 and the price is on the demand curve at P_3. However, at Q_1 the profit-maximizing price is less than both the ATC and the AVC. Therefore, the firm will minimize its losses by shutting down in the short run and exiting the market in the long run if conditions do not change. Thus, the profit-maximizing output in the short run is zero, not Q_3, since the firm will shut down.
(E)	Incorrect. There is sufficient information to determine the firm's action in the short run. The monopolist's profit-maximizing output is determined by equating marginal revenue to marginal cost. In the graph provided, marginal revenue equals marginal cost at Q_1 and the price is on the demand curve at P_3. However, at Q_1 the profit-maximizing price is less than both the ATC and the AVC. Therefore, the firm will minimize its losses by shutting down in the short run and exiting the market in the long run if conditions do not change. Thus, the profit-maximizing output in the short run is zero since the firm will shut down.

Question 40

Skill	Learning Objective	Topic
2.A	PRD-3.B	Monopoly

(A)	Incorrect. Increasing the quantity produced to Q_2 and lowering price to P_2 adds more to the total cost than it adds to the firm's total revenue. It increases the firm's losses because the firm is producing where $MC > MR$.
(B)	Incorrect. Increasing the quantity produced to Q_3 and price to P_4 is not plausible; the price that is consistent with Q_3 occurs on the demand curve between P_2 and P_1. In addition, the firm is producing where $MC > MR$, making its losses bigger.
(C)	Incorrect. Producing Q_1 and setting price equal to marginal revenue will widen the loss because it reduces total revenue without any reduction in the cost of production. Additionally, setting the price equal to marginal cost is not on the demand curve and not consistent with Q_1.
(D)	**Correct**. In the graph provided, marginal revenue equals marginal cost at Q_1 and the price is on the demand curve at P_3. However, at Q_1 the profit-maximizing price is less than both the ATC and the AVC. Therefore, the firm will minimize its losses by shutting down in the short run and exiting the market in the long run if conditions do not change.
(E)	Incorrect. There is no economic reason to build a larger plant given the market conditions, and firms do not build a larger plant to achieve decreasing returns to scale. The firm will minimize its losses by shutting down in the short run and exiting the market in the long run if conditions do not change.

Question 41

Skill		Learning Objective	Topic
2.C		CBA-2.D	Profit Maximization
(A)	Incorrect. The firm is producing where marginal cost is greater than marginal revenue and therefore is not maximizing profit. To maximize profit, the firm should reduce its output to where marginal revenue equals marginal cost.		
(B)	Incorrect. The firm's profit will decrease (rather than increase) by increasing the quantity sold because each additional output adds more to the firm's cost than it does to the firm's revenue.		
(C)	**Correct**. The firm is producing where marginal cost is greater than marginal revenue. Profit is maximized when marginal revenue equals marginal cost, so the firm will increase its profits by decreasing output to where marginal revenue equals marginal cost.		
(D)	Incorrect. It is not possible to determine the type of profit the firm is currently earning without knowing its average total cost.		
(E)	Incorrect. It is not possible to determine whether the firm's accounting profit is positive, negative, or zero without knowing its average total cost (or explicit and implicit costs).		

Question 42

Skill		Learning Objective	Topic
2.A		PRD-4.D	Monopsonistic Markets
(A)	Incorrect. In a monopsonistic labor market when the firm hires additional workers, the marginal factor (resource) cost is greater than the supply price of labor. Therefore, the supply curve is upward-sloping, not horizontal.		
(B)	Incorrect. In a monopsonistic labor market when the firm hires additional workers, the marginal factor (resource) cost is greater than the supply price of labor. Therefore, the marginal factor cost curve is upward-sloping and lies above the supply curve; it is not the same as the supply curve for labor.		
(C)	Incorrect. At its optimal level of employment, the firm pays a wage rate lower (not higher) than the competitive market wage rate.		
(D)	Incorrect. In a monopsonistic labor market, the imposition of a minimum wage may result in larger, smaller, or the same employment as in the competitive market.		
(E)	**Correct**. In a monopsonistic labor market when the firm hires additional workers, the marginal factor (resource) cost is greater than the supply price of labor. Therefore, the marginal factor cost curve is upward-sloping and lies above the labor supply curve.		

Question 43

Skill	Learning Objective	Topic
2.A	PRD-4.C	Profit-Maximizing Behavior in Perfectly Competitive Factor Markets

(A)	Incorrect. A firm hires labor in a perfectly competitive labor market as long as the marginal revenue product of labor (MRPL) is greater than the marginal factor cost (MFC), which is the same as the market wage. It is the MRPL, not the total product, that is relevant to the firm's profit-maximizing decisions.
(B)	Incorrect. A firm hires labor in a perfectly competitive labor market as long as the marginal revenue product of labor (MRPL) is greater than the marginal factor cost (MFC), which is the same as the market wage. It is the marginal revenue product of labor, not the average product, that is relevant to the firm's profit-maximizing decisions.
(C)	Incorrect. When the marginal revenue product of labor (MRPL) is less than the marginal factor cost (MFC, which is the same as the market wage), the firm is not using the profit-maximizing quantity of labor. It can increase profit by hiring additional workers until the MRPL = MFC.
(D)	Incorrect. When the marginal revenue product of labor (MRPL) is greater than the marginal factor cost (MFC, which is the same as the market wage), the firm is not using the profit-maximizing quantity of labor. It can increase profit by hiring fewer workers until the MRPL = MFC.
(E)	**Correct**. When the marginal revenue product of labor is equal to the marginal factor cost (which is the same as the market wage), the firm is using the profit-maximizing quantity of labor, and profit is maximized.

Question 44

Skill	Learning Objective	Topic
2.A	POL-3.A	Externalities

(A)	Incorrect. In the presence of negative externalities (e.g., pollution), the marginal social cost exceeds the marginal private cost, and the marginal social benefit is less than the marginal social cost.
(B)	Incorrect. In the presence of negative externalities (e.g., pollution), the marginal social cost exceeds the marginal private cost, and the marginal social benefit is equal to the marginal private cost.
(C)	**Correct**. In the presence of negative externalities (e.g., pollution), the marginal social cost exceeds the marginal private cost, and the marginal social benefit is less than the marginal social cost.
(D)	Incorrect. In the presence of negative externalities (e.g., pollution), the marginal social cost exceeds the marginal private cost, but the marginal social benefit is equal to the marginal private benefit.
(E)	Incorrect. In the presence of negative externalities (e.g., pollution), the total social cost is greater than (not less than) the total social benefit.

Question 45

Skill	Learning Objective	Topic
2.A	POL-3.C	Public and Private Goods

(A)	Incorrect. When goods are nonrival and nonexcludable in consumption, it is difficult to exclude nonpayers, leading to underproduction of such goods relative to the socially optimal quantity. Less than (rather than more than) the socially optimal quantity is produced and consumed.
(B)	Incorrect. When goods are nonrival and nonexcludable in consumption, it is difficult to exclude nonpayers, leading to underproduction of such goods relative to the socially optimal quantity. Less than the socially optimal quantity is produced and consumed.
(C)	**Correct**. When goods are nonrival and nonexcludable in consumption, it is difficult to exclude nonpayers, leading to underproduction of such goods relative to the socially optimal quantity.
(D)	Incorrect. When goods are nonrival and nonexcludable in consumption it is difficult to exclude nonpayers, leading to underproduction of such goods relative to the socially optimal quantity. Thus, there is underproduction, not a surplus of such goods.
(E)	Incorrect. Nonrival and nonexcludable goods yield consumer surplus.

Question 46

Skill	Learning Objective	Topic
1.A	MKT-3.A	Demand

(A)	Incorrect. People are primarily motivated to pursue their self-interest rather than societal goals.
(B)	Incorrect. Individual private property rights provide people incentives to use available resources to produce goods and services that will allow them to profit by selling their goods and services to consumers who value them. Goods and services are produced to satisfy demand as reflected by the willingness to pay.
(C)	Incorrect. Individual private property rights provide people incentives to use available resources to produce goods and services that will allow them to profit by selling their goods and services to consumers who value them. However, competitive markets do not necessarily achieve an equitable distribution of goods and services.
(D)	Incorrect. Rational individuals pay attention to both costs and benefits in making economic decisions, not only to benefits.
(E)	**Correct**. Individual private property rights provide people incentives to use available resources to produce goods and services that will allow them to profit by selling their goods and services to consumers who value them. Market prices provide the incentive and the signal regarding what is valued.

Question 47

Skill	Learning Objective	Topic
2.A	MKT-4.B	Market Disequilibrium and Changes in Equilibrium

(A)	Incorrect. A decrease in the supply of coffee will shift the supply curve for coffee to the left and raise the equilibrium price for coffee. Since coffee is an input for brewed coffee, the increase in the price of coffee will increase the cost of making brewed coffee and cause a decrease in the supply of brewed coffee, raising the price and decreasing the quantity. Since disposable cups are an input for serving brewed coffee, their demand will decrease, resulting in a decrease (not an increase) in the price of disposable coffee cups.
(B)	Incorrect. A decrease in the number of locations serving brewed coffee will result in a decrease in the supply of brewed coffee, raising the equilibrium price and decreasing the equilibrium quantity. This will decrease the demand for disposable cups and lowers (not increase) their price.
(C)	Incorrect. An increase in the supply of disposable coffee cups will result in a decrease in the equilibrium price, not an increase.
(D)	**Correct**. An increase in the demand for brewed coffee will shift the demand curve for disposable coffee cups to the right, resulting in a higher equilibrium price and equilibrium quantity of disposable coffee cups.
(E)	Incorrect. An increase in the price of tea, a complement for coffee, will cause a decrease in the demand for coffee, resulting in a lower price for coffee.

Question 48

Skill	Learning Objective	Topic
3.A	POL-1.A	The Effects of Government Intervention in Markets

(A)	Incorrect. The price floor raises the price above the equilibrium price of $20, reducing the quantity demanded while supply remains constant. The result will be a surplus (not a shortage) of the good in the market.
(B)	**Correct**. The price floor raises the price above the equilibrium price of $20, reducing the quantity demanded while supply remains constant. The quantity demanded will fall, but the quantity supplied will not change. The market will not achieve equilibrium, resulting in a decrease in both the consumer and producer surpluses.
(C)	Incorrect. The equilibrium price of the good with the price floor will increase (not decrease). The quantity sold of the good to consumers will decrease because the price floor will cause a decrease in quantity demanded.
(D)	Incorrect. The equilibrium price of the good with the price floor will increase, and the quantity sold of the good to consumers will decrease (not remain unchanged) because the price floor will cause a decrease in quantity demanded.
(E)	Incorrect. As a result of the price floor, demand for substitutes for the good will increase (not decrease), as consumers try to substitute the higher-priced good with lower-priced substitutes.

Question 49

Skill	Learning Objective	Topic
3.C	MKT-3.A	Demand

(A)	Incorrect. At $12, Adey buys 2 units and Sarah buys 0 units for a total quantity of 2 units in the market. At $6, Adey buys 5 units and Sarah buys 3 units for a total market quantity of 8 units. Thus, when the price decreases from $12 to $6, the quantity demanded along the market demand curve increases from 2 to 8 units (not from 2 to 4 units).
(B)	Incorrect. At $12, Adey buys 2 units and Sarah buys 0 units for a total quantity of 2 units in the market. At $6, Adey buys 5 units and Sarah buys 3 units for a total market quantity of 8 units. Thus, when the price decreases from $12 to $6, the quantity demanded along the market demand curve increases from 2 to 8 units (not from 2 to 5 units).
(C)	**Correct**. At $12, Adey buys 2 units and Sarah buys 0 units for a total quantity of 2 units in the market. At $6, Adey buys 5 units and Sarah buys 3 units for a total market quantity of 8 units. Thus, when the price decreases from $12 to $6, the quantity demanded along the market demand curve increases from 2 to 8 units.
(D)	Incorrect. At $12, Adey buys 2 units and Sarah buys 0 units for a total quantity of 2 units in the market. At $6, Adey buys 5 units and Sarah buys 3 units for a total market quantity of 8 units. Thus, when the price decreases from $12 to $6, the quantity demanded along the market demand curve increases from 2 to 8 units (not from 0 to 14 units).
(E)	Incorrect. At $12, Adey buys 2 units and Sarah buys 0 units for a total quantity of 2 units in the market. At $6, Adey buys 5 units and Sarah buys 3 units for a total market quantity of 8 units. Thus, when the price decreases from $12 to $6, the quantity demanded along the market demand curve increases from 2 to 8 units (not from 8 to 14 units).

Question 50

Skill	Learning Objective	Topic
2.A	PRD-1.A	The Production Function

(A)	Incorrect. The marginal product of labor can be negative with an overuse of labor, but the average product of labor will never be negative.
(B)	Incorrect. When marginal product is rising, the average product is also rising, but it is less than the marginal product.
(C)	Incorrect. When the average product of labor is rising, the marginal product of labor may be rising or falling.
(D)	**Correct**. When the average product of labor is rising, the marginal product is above it, pulling the average up. When the marginal is below the average product, the average product is falling because the marginal product is pulling it down. The average product is at its maximum when the marginal product equals the average product. Therefore, if the average product of labor is falling, the marginal product of labor must be less than the average product of labor.
(E)	Incorrect. The marginal product curve crosses the average product curve at its highest point; thus, the two are equal at that point.

Question 51

Skill	Learning Objective	Topic
2.A	PRD-2.A	Firms' Short-Run Decisions to Produce and Long-Run Decisions to Enter or Exit a Market

(A)	Incorrect. A firm's (May's) short-run supply curve is the portion of the marginal cost curve that lies above the minimum AVC. On the graph that is line segment STV, not TW.
(B)	Incorrect. A firm's (May's) short-run supply curve is the portion of the marginal cost curve that lies above the minimum AVC. On the graph that is line segment STV, not RST.
(C)	**Correct**. A firm's (May's) short-run supply curve is the portion of the marginal cost curve that lies above the minimum AVC . On the graph that is line segment STV.
(D)	Incorrect. A firm's (May's) short-run supply curve is the portion of the marginal cost curve that lies above the minimum AVC. On the graph that is line segment STV, not STW.
(E)	Incorrect. A firm's (May's) short-run supply curve is the portion of the marginal cost curve that lies above the minimum AVC. On the graph that is line segment STV, not RSTV.

Question 52

Skill	Learning Objective	Topic
2.A	PRD-3.A	Perfect Competition

(A)	Incorrect. Firms are price takers because each firm's output is a very small percentage of the total market and its output decision will not influence the market price. This is not the characteristic that causes firms to earn zero economic profit in the long run. The key assumption that leads to long-run adjustment in perfectly competitive markets is the assumption of no barriers to entry or exit.
(B)	Incorrect. Producing identical products simply implies that the firms' products are perfect substitutes and individual firms are price takers. This is not the reason for zero economic profit in the long run. The key assumption that leads to long-run adjustment in perfectly competitive markets is the assumption of no barriers to entry or exit.
(C)	Incorrect. The response describes why firms are price takers, not why they earn zero economic profits in the long run. The key assumption that leads to long-run adjustment in perfectly competitive markets is the assumption of no barriers to entry or exit.
(D)	Incorrect. The horizontal industry supply curve indicates that the industry is a constant cost industry. It does not explain why firms earn zero economic profits in the long run. The key assumption that leads to long-run adjustment in perfectly competitive markets is the assumption of no barriers to entry or exit.
(E)	**Correct**. The key assumption that leads to long-run adjustment in perfectly competitive markets is the assumption of no barriers to entry or exit (easy entry or exit). Depending on the market condition in the short run, firms respond by entering the market if economic profits are positive and exiting the market if economic profits are negative. The entry or exit of firms will stop when each firm earns zero economic profit. That means no firm has an incentive to leave the market or enter the market.

Question 53

Skill	Learning Objective	Topic
3.A	PRD-3.A	Perfect Competition

(A)	Incorrect. The positive economic profits will attract new firms to enter the market. The entry of new firms will increase supply and decrease the price (not increase the price). The price will continue to fall until it is equal to minimum average total cost for each firm and economic profits are eliminated.
(B)	Incorrect. The positive economic profits will attract new firms to enter the market. The entry of new firms increases (not decreases) the number of firms in the market, which increases supply and decreases (not increases) the price. The price will continue to fall until it is equal to minimum average total cost for each firm and economic profits are eliminated.
(C)	**Correct**. The positive economic profits will attract new firms to enter the market. The entry of new firms increases the number of firms, which increases supply and decreases the price. The price will continue to fall until it is equal to minimum average total cost for each firm and economic profits are eliminated.
(D)	Incorrect. The positive economic profits will attract new firms to enter the market. The entry of new firms increases (not decreases) the number of firms, which increases supply and decreases the price. The price will continue to fall until it is equal to minimum average total cost for each firm and economic profits are eliminated.
(E)	Incorrect. The positive economic profits will attract new firms to enter the market. The entry of new firms increases the number of firms, which increases supply and decreases the price. The price will continue to fall until it is equal to minimum average total cost for each firm and economic profits are eliminated.

Question 54

Skill		Learning Objective	Topic
1.C		CBA-2.C	Types of Profit
(A)	Incorrect. The $30,000 is Jamal's accounting profit, but his economic profit is negative when all the implicit costs are deducted from the accounting profit. Economic profit is calculated as the difference between total revenue minus both explicit and implicit costs. Given the data above, Jamal's economic profit is $(\$60,000 - \$30,0000 - \$30,000 - \$12,000 - \$2,000) = -\$14,000$.		
(B)	Incorrect. Economic profit is calculated as the difference between total revenue minus both explicit and implicit costs. Given the data above, Jamal's economic profit is $(\$60,000 - \$30,0000 - \$30,000 - \$12,000 - \$2,000) = -\$14,000$.		
(C)	Incorrect. Economic profit is calculated as the difference between total revenue minus both explicit and implicit costs. Given the data above, Jamal's economic profit is $(\$60,000 - \$30,0000 - \$30,000 - \$12,000 - \$2,000) = -\$14,000$.		
(D)	Incorrect. Economic profit is calculated as the difference between total revenue minus both explicit and implicit costs. Given the data above, Jamal's economic profit is $(\$60,000 - \$30,0000 - \$30,000 - \$12,000 - \$2,000) = -\$14,000$.		
(E)	**Correct**. Economic profit is calculated as the difference between total revenue minus both explicit and implicit costs. Given the data above, Jamal's economic profit is $(\$60,000 - \$30,0000 - \$30,000 - \$12,000 - \$2,000) = -\$14,000$.		

Question 55

Skill	Learning Objective	Topic
2.A	PRD-3.B	Monopolistic Competition

(A)	**Correct**. In long-run equilibrium, firms produce the profit-maximizing quantity by equating marginal cost to marginal revenue. The price set is greater than marginal cost, creating deadweight loss. Therefore, monopolistically competitive firms are not allocatively efficient.
(B)	Incorrect. At the profit-maximizing quantity, marginal cost is not greater than minimum average total cost. Monopolistically competitive firms are allocatively inefficient because price is greater than marginal cost, not because marginal cost is greater than minimum average total cost.
(C)	Incorrect. Firms do not maximize profit by producing where marginal revenue is greater than marginal cost. Monopolistically competitive firms are allocatively inefficient because price is greater than marginal cost, not because they produce where marginal revenue is greater than marginal cost.
(D)	Incorrect. Firms produce where marginal revenue equals marginal cost to maximize profit. There is no overallocation of resources.
(E)	Incorrect. Firms in monopolistic competition produce differentiated, not homogenous, products.

Question 56

Skill	Learning Objective	Topic
2.C	PRD-3.A	Perfect Competition

(A)	Incorrect. The firm is currently producing where marginal cost ($7) is greater than marginal revenue (which is equal to price, $5). The firm can increase profit by decreasing output (not increasing output) to where marginal cost equals price, not to where price equals average total cost.
(B)	Incorrect. The firm is currently producing where marginal cost ($7) is greater than marginal revenue (which is equal to price, $5). The firm can increase profit by decreasing output (not increasing output) to where marginal cost equals price.
(C)	Incorrect. The firm is currently producing where marginal cost ($7) is greater than marginal revenue (which is equal to price, $5). The firm can increase profit by decreasing output, (not by keeping output at its current level) to where marginal cost equals price.
(D)	**Correct**. The firm is currently producing where marginal cost ($7) is greater than marginal revenue (which is equal to price, $5). The firm can increase profit by decreasing output to where marginal cost equals price.
(E)	Incorrect. The firm is currently producing where marginal cost ($7) is greater than marginal revenue (which is equal to price, $5). The firm can increase profit by decreasing output to where marginal cost equals price, not to where price is equal to average total cost.

Question 57

Skill		Learning Objective	Topic
2.A		POL-5.B	Inequality
(A)	Incorrect. Both accountants and teachers require academic training and education to practice. Both have identical marginal revenue schedules. Therefore, the difference in earnings cannot be explained by the differences in human capital.		
(B)	Incorrect. Earning differentials are not based on differences in opportunity cost.		
(C)	Incorrect. Whether or not the job provides a pleasant work environment does not explain why accountants earn more than school teachers.		
(D)	**Correct**. If the supply of accountants is low relative to the supply of teachers, accountants will receive higher starting salaries than school teachers.		
(E)	Incorrect. If fewer school teachers graduate each year than accountants, that will imply teachers' salaries will be higher (not lower) than accountants' salaries.		

Question 58

Skill		Learning Objective	Topic
3.A		PRD-4.B	Changes in Factor Demand and Factor Supply
(A)	**Correct**. An increase in the number of older people in a country will increase the demand for healthcare workers.		
(B)	Incorrect. An increase in the number of older people in a country will increase the demand for healthcare workers, which will increase the wages of the healthcare workers. An increase in wages means that the marginal factor cost will increase, not decrease.		
(C)	Incorrect. An increase in the number of older people in a country will increase the demand for healthcare workers. As the demand for healthcare workers increases along the supply curve, the wages of the healthcare workers will increase and the quantity of healthcare workers supplied will increase, not decrease.		
(D)	Incorrect. The quality of healthcare services cannot be determined from the given information.		
(E)	Incorrect. An increase in the number of older people in a country will increase the demand for healthcare workers, which will increase (not decrease) the wages of the healthcare workers.		

Question 59

Skill	Learning Objective	Topic
2.A	POL-4.A	The Effects of Government Intervention in Different Market Structures

(A)	Incorrect. If City Cable operates as a natural monopoly, setting price equal to marginal cost will make it operate at a loss. In order for City Cable to earn zero economic profit, the government should set its price equal to average total cost.
(B)	Incorrect. The marginal revenue is less than the demand curve, and setting price equal to marginal revenue would lead City Cable to operate at a loss. In order for City Cable to earn zero economic profit, the government should set its price equal to average total cost.
(C)	**Correct**. If the price is equal to average total cost, City Cable will earn zero economic profit.
(D)	Incorrect. Setting price equal to average variable cost will be a price below average total cost, and therefore, City Cable will operate at a loss. In order for City Cable to earn zero economic profit, the government should set its price equal to average total cost.
(E)	Incorrect. To set price equal to total cost is not feasible; price will exceed all per-unit costs to the level where no quantity will be purchased. In order for City Cable to earn zero economic profit, the government should set its price equal to average total cost.

Question 60

Skill	Learning Objective	Topic
1.A	POL-5.B	Inequality

(A)	Incorrect. A progressive income tax is characterized by a lower (not higher) average tax rate at low income levels than at high income levels.
(B)	Incorrect. Progressive income tax rates are not dependent on total tax revenues.
(C)	Incorrect. A progressive income tax is by definition one in which marginal tax rates increase as income increases, and vice versa.
(D)	**Correct**. A progressive income tax is by definition one in which marginal tax rates increase as income increases, and vice versa.
(E)	Incorrect. A progressive income tax is by definition one in which marginal tax rates increase (not decrease) as income increases, and vice versa.

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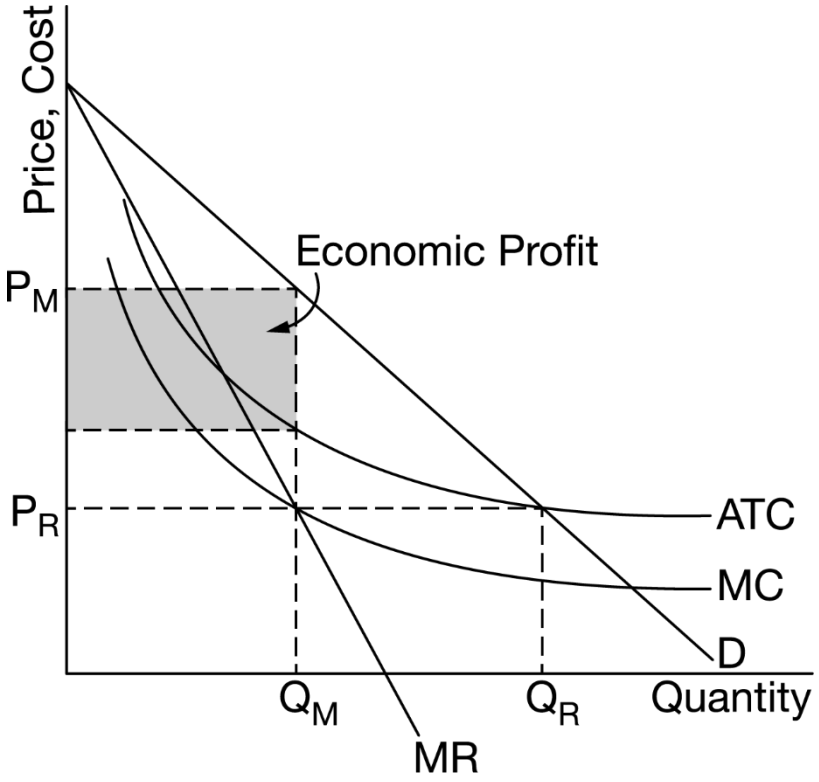
Question 1

9 Points (1, 5, 1, 2)

(a) 1 Point

- One point is earned for describing any of the following conditions that distinguish a natural monopoly from a typical monopoly.
    - The firm has decreasing average total cost over the entire range of market demand.
    - The firm experiences economies of scale over the entire range of market demand.
    - The firm has a marginal cost curve that is constant or decreases over the entire range of market demand.
    - The firm's average total cost decreases everywhere.

(b) 5 points



- One point is earned for drawing a correctly labeled graph showing downward-sloping demand (D) and marginal revenue (MR) curves with the MR curve below the demand curve.
- One point is earned for showing the profit-maximizing quantity, labeled Q_M, where MR = MC.
- One point is earned for showing the profit-maximizing price, labeled P_M, from the demand curve at Q_M.
- One point is earned for showing the downward sloping or horizontal marginal cost (MC) curve below the downward sloping average total cost (ATC) curve, over the entire range of demand.
- One point is earned for completely shading the correct area of economic profit.

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Question 1 (continued)

c) 1 Point

- One point is earned for showing the maximum quantity on the graph from part (b) that would allow L&P to earn zero economic profits, labeled Q_R, and the price, labeled P_R, where the average total cost curve crosses the demand curve (P_R=ATC=D).

(d) 2 Points

- One point is earned for stating that L&P does not earn positive economic profit at the allocatively efficient quantity and for explaining that the price at which the MC curve intersects the demand curve is less than the average total cost and therefore the firm is incurring a loss.
- One point is earned for stating that L&P will need to be subsidized by the government.

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Question 2

5 points (1,1,1,1,1)

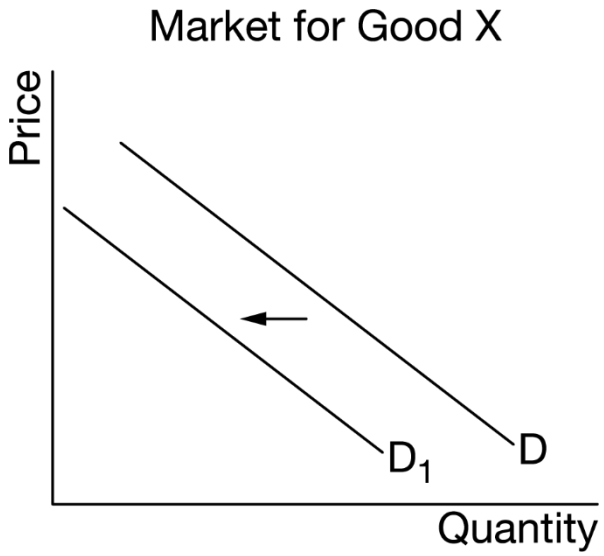
(a) 1 point:
- One point is earned for stating that the quantity demanded will decrease by 8.5%.

(b) 1 point:
- One point is earned for explaining that consumers have more substitutes for the good in the long run that are not available in the short run or there is more time to adjust in the long run.

(c) 1 point:
- One point is earned for stating that total revenue will decrease, and for explaining that demand is more elastic in the long run (3.2 > 1) so the percentage decrease in quantity will be larger than the percentage increase in price.

(d) 1 point:
- One point is earned for stating that movie tickets are a normal good and for explaining that a normal good is a good with a positive income elasticity of demand (0.75 > 0).

(e) 1 point:
- One point is earned for drawing a correctly-labeled graph showing a leftward shift of the demand curve.



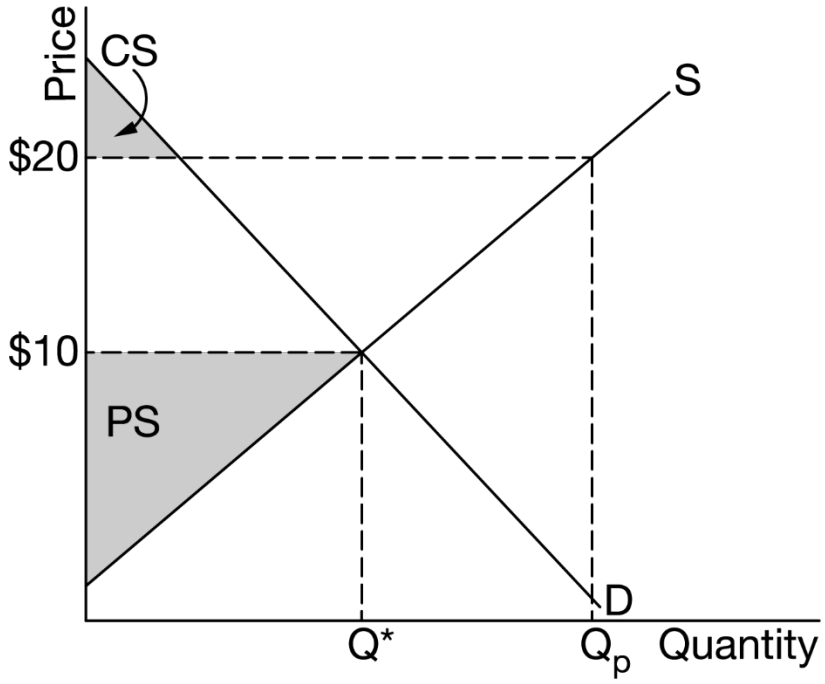
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AP® MICROECONOMICS
2019 SCORING GUIDELINES

Question 3

5 Points (2, 2, 1)

(a) 2 points



- One point is earned drawing a correctly labeled graph of the market for wheat and for showing the equilibrium price at $10 and the equilibrium quantity, labeled Q*.
- One point is earned for completely shading the correct area of producer surplus and labeling it PS.

(b) 2 points

- One point is earned for showing the world price of a bushel of wheat on the graph at $20 and for showing the quantity of wheat produced domestically, labeled Qp, from original supply curve.
- One point is earned for completely shading the correct area of consumer surplus and labeling it CS.

(c) 1 point

- One point is earned for stating that the domestic consumer surplus decreases and the domestic producer surplus increases.

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2019 AP Microeconomics Scoring Worksheet

Section I: Multiple Choice

_____	× 1.0000 =	_____
Number Correct (out of 60)		Weighted Section I Score (Do not round)

Section II: Free Response

Question 1	_____	× 1.6666 =	_____	
	(out of 9)		(Do not round)	
Question 2	_____	× 1.5000 =	_____	
	(out of 5)		(Do not round)	
Question 3	_____	× 1.5000 =	_____	
	(out of 5)		(Do not round)	

Sum = _____
Weighted Section II Score (Do not round)

Composite Score

_____	+ _____	= _____
Weighted Section I Score	Weighted Section II Score	Composite Score (Round to nearest whole number)

AP Score Conversion Chart
Microeconomics

Composite Score Range	AP Score
66-90	5
51-65	4
41-50	3
32-40	2
0-31	1

2019 AP Microeconomics
Question Descriptors and Performance Data

Multiple-Choice Questions

Question	Skill	Learning Objective	Topic	Key	% Correct
1	1.A	MKT-1.B	Resource Allocation and Economic Systems	A	73
2	2.C	MKT-1.C	Production Possibilities Curve	D	67
3	2.A	MKT-4.B	Market Disequilibrium and Changes in Equilibrium	E	75
4	2.A	MKT-3.D	Supply	D	76
5	3.A	MKT-3.E	Price Elasticity of Demand	E	52
6	2.A	CBA-2.A	Marginal Analysis and Consumer Choice	E	59
7	1.A	CBA-2.B	Marginal Analysis and Consumer Choice	E	13
8	1.A	MKT-4.A	Market Equilibrium and Consumer and Producer Surplus	C	77
9	2.C	PRD-1.A	Short-Run Production Costs	A	51
10	2.A	PRD-3.A	Perfect Competition	D	73
11	2.C	PRD-1.A	Long-Run Production Costs	D	70
12	1.C	PRD-3.C	Oligopoly and Game Theory	D	81
13	2.A	PRD-3.B	Monopolistic Competition	B	52
14	2.C	PRD-4.C	Profit-Maximizing Behavior in Perfectly Competitive Factor Markets	A	22
15	3.A	POL-3.A	Externalities	C	36
16	1.A	MKT-1.C	Production Possibilities Curve	A	84
17	3.C	POL-1.A	The Effects of Government Intervention in Markets	B	73
18	2.C	PRD-1.A	Short-Run Production Costs	A	37
19	3.A	MKT-3.A	Demand	E	54
20	2.C	PRD-1.A	The Production Function	B	79
21	2.A	PRD-3.B	Monopoly	C	71
22	1.C	PRD-3.C	Oligopoly and Game Theory	C	73
23	1.A	PRD-3.B	Price Discrimination	A	78
24	2.C	PRD-2.A	Firms' Short-Run Decisions to Produce and Long-Run Decisions to Enter or Exit a Market	A	57
25	1.C	PRD-1.A	The Production Function	D	92
26	2.C	PRD-4.C	Profit-Maximizing Behavior in Perfectly Competitive Factor Markets	E	39
27	1.C	PRD-4.C	Profit-Maximizing Behavior in Perfectly Competitive Factor Markets	C	59
28	2.C	CBA-2.B	Marginal Analysis and Consumer Choice	B	39
29	1.A	POL-5.A	Inequality	A	60
30	2.A	POL-4.A	The Effects of Government Intervention in Different Market Structures	C	47
31	2.C	MKT-2.A	Comparative Advantage and Trade	E	66
32	3.C	MKT-3.E	Price Elasticity of Supply	E	54
33	2.C	MKT-3.E	Other Elasticities	C	59
34	2.A	MKT-4.B	Market Disequilibrium and Changes in Equilibrium	A	61
35	2.C	CBA-2.A	Marginal Analysis and Consumer Choice	B	81
36	2.C	PRD-4.C	Profit-Maximizing Behavior in Perfectly Competitive Factor Markets	B	44

2019 AP Microeconomics
Question Descriptors and Performance Data

Question	Skill	Learning Objective	Topic	Key	% Correct
37	2.A	PRD-3.C	Oligopoly and Game Theory	E	68
38	2.A	PRD-3.B	Monopoly	E	48
39	2.A	PRD-3.B	Monopoly	A	21
40	2.A	PRD-3.B	Monopoly	D	64
41	2.C	CBA-2.D	Profit Maximization	C	39
42	2.A	PRD-4.D	Monopsonistic Markets	E	39
43	2.A	PRD-4.C	Profit-Maximizing Behavior in Perfectly Competitive Factor Markets	E	71
44	2.A	POL-3.A	Externalities	C	66
45	2.A	POL-3.C	Public and Private Goods	C	67
46	1.A	MKT-3.A	Demand	E	47
47	2.A	MKT-4.B	Market Disequilibrium and Changes in Equilibrium	D	60
48	3.A	POL-1.A	The Effects of Government Intervention in Markets	B	44
49	3.C	MKT-3.A	Demand	C	57
50	2.A	PRD-1.A	The Production Function	D	33
51	2.A	PRD-2.A	Firms' Short-Run Decisions to Produce and Long-Run Decisions to Enter or Exit a Market	C	43
52	2.A	PRD-3.A	Perfect Competition	E	45
53	3.A	PRD-3.A	Perfect Competition	C	78
54	1.C	CBA-2.C	Types of Profit	E	38
55	2.A	PRD-3.B	Monopolistic Competition	A	48
56	2.C	PRD-3.A	Perfect Competition	D	39
57	2.A	POL-5.B	Inequality	D	80
58	3.A	PRD-4.B	Changes in Factor Demand and Factor Supply	A	85
59	2.A	POL-4.A	The Effects of Government Intervention in Different Market Structures	C	64
60	1.A	POL-5.B	Inequality	D	85

Free-Response Questions

Question	Skill	Learning Objective	Topic	Mean Score
1	2.A	PRD-3.B	Monopoly	4.27
2	1.C	CBA-2.A	Marginal Analysis and Consumer Choice	1.75
3	1.A	PRD-3.C	Oligopoly and Game Theory	3.24