Answers and Explanations

(The section on the course outline is indicated in parentheses.)

1. **E.** The first four choices are direct costs that must be paid. Forgone earnings represent the cost of the next best alternative to going to college (working). (I)
2. **B.** The additional cost of buying the third cookie is \$0.50 (\$2.25 – \$1.75). (I)
3. **B.** Market economies allocate resources through the exchange of goods and services in markets. (I)
4. **C.** Point c is below the curve; therefore, the economy is not producing as much as possible. (I)
5. **D.** Point d is beyond the curve and is therefore beyond the possibilities of the economy. (I)
6. **B.** A decrease in the labor force is a decrease in resources (labor) and will decrease the level of production possibilities. (I)
7. **B.** Cars and gasoline are complements. A decrease in the price of cars will lead to the purchase of more cars and therefore an increase in the demand for gasoline. (IIA)
8. **D.** Wages are the price of labor (an input into the production of textiles). An increase in price will lead to a decrease in the quantity of textile workers demanded and therefore a decrease in the supply of the textiles made by the workers. (IIA)
9. **D.** If the price of good X increases, people will buy less X. If they then also buy less Y, it shows X and Y go together (i.e., they are complements). (IIA)
10. **C.** Both supply and demand will shift to the right. Shifts to the right always increase quantity. (IIA)
11. **B.** To prevent the price from going to equilibrium (and therefore having an effect on the market) the ceiling must be below equilibrium. (IIA)
12. **C.** A zero change in quantity demanded means that quantity never changes, regardless of the price. The percentage change in quantity—the numerator of the elasticity formula—is zero. Price elasticity of demand is zero, which is perfectly inelastic. The demand curve is vertical. (IIA)
13. **B.** If elasticity of demand is less than 1, demand is inelastic. The quantity effect will be less than the price effect, so firms will increase total revenue by raising price. (IIA)
14. **A.** Income elasticity of demand is (20/100)/(20,000/50,000) = .5. The positive relationship tells us the good is a normal good. (She buys more as her income increases.) (IIA)
15. **C.** A decrease in supply will raise the equilibrium price, which will decrease consumer, producer, and total surplus. (IIA)
16. **C.** Consumer surplus is $(1/2)(1 \times 2) = 1$ and producer surplus is $(1/2)(1 \times 3) = 1.5$. Total surplus is consumer surplus plus producer surplus, or 1 + 1.5 = \$2.5m. (IIA)
17. **E.** Given the slopes of the supply and demand curves, the tax burden will be shared by consumers and producers (so A and B are not correct). The quantity sold in the market will decrease as a result of the tax, so government revenue will be less than \$1m. The tax will raise the price consumers pay and decrease the price producers receive so that total surplus decreases. Moving the market away from equilibrium creates a deadweight loss. (IIA)
18. **A.** The law of diminishing marginal utility. (IIB)
19. **E.** The additional utility from the first unit is 10 and the additional utility from the second unit is 8 for a total of \$18. (IIB)
20. **A.** The marginal utility per dollar spent on goods A and B are equal (5), so the consumer is maximizing utility. (IIB)
21. **D.** The additional output from hiring the fourth worker is 32 – 26 = 6. (IIC)
22. **D.** Average product = $TP/L = 18/2 = 9$. (IIC)
23. **C.** The law of diminishing (marginal) returns. (IIC)
24. **C.** At least one factor of production is fixed in the short run. (IIC)

25. **C.** The marginal product per dollar spent for labor is 50/10 = 5 and for capital is 48/6 = 8. The firm should hire more labor because the additional output it receives per dollar spent on labor is greater than the additional output it receives per dollar spent on capital. Hiring more labor means hiring less capital because the firm was already producing the desired level of output. (IIC)

26. **C.** Economic profit (which is zero in this case) includes both implicit and explicit costs. Accounting profit includes only explicit costs. Therefore, accounting profit must be positive because it excludes implicit costs. (IID)

27. **D.** *MC* = *MR* is the rule for profit maximization. (IID)

28. **D.** For the average to be falling, the added units must be below the average (to pull it down). (IIC)

29. **B.** The firm is a price taker, so marginal revenue and demand are both equal to price. (IID)

30. **D.** Find *MC* as the change in *TC* in the table. *MC* = *MR* = *P* = 8 at an output of 5. (IID)

31. **A.** Profit equals total revenue minus total cost. Profit = ($8 × 5) − 30 = 40 − 30 = $10. (IID)

32. **B.** Easy entry and exit will cause firms to enter when there are profits. This increases the number of firms, which increases supply and drives down price. (IID)

33. **E.** All three statements are true. (IID)

34. **D.** Allocative efficiency occurs when resources are allocated so the price equals marginal cost. (IID)

35. **D.** Quantity is found where *MC* = *MR*. Price is found on the demand curve at that quantity. (IID)

36. **C.** Price exceeds *ATC*, so the monopoly is earning a profit. Profit equals total revenue minus total cost. Profit = ($14 × 100) − ($10 × 100) = $1400 − $1000 = $400. Or, profit per unit is $14 − $10 = $4 on each of 100 units = $400. (IID)

37. **E.** Monopolies reduce quantity and increase price relative to perfectly competitive firms, creating deadweight loss. (IID)

38. **C.** Deadweight loss is the reduction in consumer surplus that does *not* go to the monopoly as increased profit due to the higher price from monopoly. (Note: there is no producer surplus when *MC* is constant.) This is the area of the triangle with a base of 8 − 3 = 5 and a height of 14 − 10 = 4. Deadweight loss equals ½ (5 × 4) = ½ (20) = $10. (IID)

39. **D.** Because price does not equal *MC*, the monopoly would not be allocatively efficient. When price equals *ATC*, the firm earns a normal profit. (IID)

40. **E.** All three are true. (IID)

41. **A.** The distinguishing characteristic of oligopoly is interdependent firms. (IID)

42. **A.** Firm 2 can earn either $1.5m or $0.5m if firm 1 advertises. Its best strategy is to advertise and earn $1.5m. (IID)

43. **C.** The best outcome for each firm and for the two firms combined is to advertise. (Each firm earns the maximum $1.5m, and the combined total of $3m is the highest total for the market.) (IID)

44. **D.** Monopolistically competitive industries have many buyers and sellers. (IID)

45. **D.** Firms maximize profits so *MC* = *MR*. In the long run they earn a normal profit, so *P* = *ATC*. The demand curve has a negative slope, so price will be above *MC* = *MR*. (IID)

46. **D.** The marginal revenue product curve is the individual firm's demand curve for labor. (III)

47. **E.** Online banking is a substitute for conducting a transaction with a bank teller, so more online banking will decrease the demand for tellers. (III)

48. **D.** The labor supply curve for an individual is described as "backward bending." It starts out at low wages with a positive slope and changes to a negative slope at a sufficiently high wage when the income effect begins to dominate the substitution effect. (III)

49. E. The profit-maximizing condition applied to factor markets is *MFC* = *MRP*. (III)
50. A. More opportunities will (and did) bring more women into the labor force, increasing the supply of labor. (III)
51. A. The requirements make it harder to become a mechanic so the supply of mechanics will decrease. A decrease in supply will shift the supply curve to the left, raising wages and therefore the price of repairs. (III)
52. D. The marginal product per dollar spent on labor is higher (100/10 versus 100/12), so the firm should hire more labor, less capital. (III)
53. D. The other student's flu is spread to you, so his or her actions imposed a cost on you. (IV)
54. C. People can be prevented from viewing a cable TV broadcast. (IV)
55. D. Q2 is the equilibrium quantity. At Q_2, marginal social cost is P_3 and price is P_1. *MEC* = *MSC* − P_1. (IV)
56. C. The market produces at equilibrium (Q_2), which is more than the efficient level of output (Q_1, at which *MSC* = P). (IV)
57. E. To internalize the externality and move the market to the optimal quantity, the government must impose a tax equal to the *MEC*. (IV)
58. E. If I consume an apple, no one else can consume it. (IV)
59. C. Markets fail to produce enough of a public good. Therefore, the government must step in to provide it. (IV)
60. B. Marginal productivity theory applies to the division of income among factors. (IV)

VI. Reviewing for the AP Microeconomics Exam

One of the best ways to prepare for the AP exam is to work released free-response questions and practice answering as many examples of multiple-choice questions as you can. As you begin, keep the list of key microeconomic formulas and graph review sheets handy and use them as study guides. With practice, you will discover that these formulas and graphs become implanted in your memory. Make sure that you practice and review enough that you can recall and apply these formulas, and draw and interpret graphs without the guides on the AP exam.

The Formulas of Micro

There will be both multiple-choice and free-response questions on the AP Microeconomics exam that require calculations. For example, you may be required to calculate one of several elasticities, costs, or profits. To answer calculation questions, you will need to remember and understand some important equations and formulas. The key microeconomic equations and formulas are listed below.

Marginal Analysis Economics focuses on marginal analysis. Marginal analysis involves making a decision about incremental changes to the status quo. To make a decision "on the margin" (i.e., using marginal analysis), you compare the additional costs of an activity to the additional benefits. The optimal amount of an activity is found where marginal costs equal marginal benefits. In microeconomics, the solution is very often found at the quantity where *MC* = *MB*.

Marginal cost = Marginal revenue

MC = *MB*

*For a firm, revenue is the benefit, so profit-maximizing output is found where *MC* = *MR*.
*When hiring factors of production, we use terminology specific to the factor market, but the analysis is the same. A firm will hire a factor of production up to the point at which *MFC* = *MRP*.