Multiple Choice Questions (best 13 out of 14: 39 points)

1. (3 points) The price of flour, an ingredient used in making baguettes, increases. At the same time, the price of croissants, a substitute for baguettes, decreases. What is the impact on the price of baguettes?
   A. The price of baguettes increases
   B. The price of baguettes decreases
   C. The price of baguettes stays the same
   D. Not enough information to determine

   1. ____________

2. (3 points) Alice has \$6 to spend on ice cream or chocolate. One ice cream costs \$2 and one chocolate costs \$1. Ice cream and chocolate are perfect substitutes to her: she is indifferent between one ice cream and three chocolates. How many ice creams and chocolates does he optimally consume?
   A. 3 ice creams and 0 chocolates
   B. 2 ice creams and 2 chocolates
   C. 0 ice creams and 6 chocolates
   D. 1 ice cream and 4 chocolates
   E. Not enough information

   2. ____________

3. (3 points) Which of the following is always true in the short-run equilibrium under perfect competition?
   A. At the equilibrium quantity, demand is unit-elastic
   B. Each firm produces the quantity such that its marginal costs equals its marginal revenue
   C. A firm shuts down whenever the market price falls below its average total costs
   D. The firm earns positive profits

   3. ____________

4. (3 points) Consider the perfectly competitive market for oranges, with market demand $P = 10 - Q$ and market supply $P = Q$. Consumers currently buy 2 units at a price of \$8 per unit. Which of the following could be true?

   I. A per unit tax of \$6 is imposed on sellers
   II. A price floor of \$8 is imposed on the market
   III. Due to a hurricane the supply equation has become $P = Q + 4$

   A. Only I B. Only II C. Only III D. I and II E. I and III
   F. II and III G. All of the above H. None of the above

   4. ____________

5. (3 points) Suppose home-owners listing their homes on AirBnB are more responsive to prices compared to tourists looking for a place to stay. Consider an upward sloping supply and downward sloping demand. Upon imposing a \$10 tax on home-owners:
   A. The price received by listers drops by \$10
   B. The price paid by tourists rises by \$10
   C. The tax falls more on tourists
   D. The tax is split equally between tourists and listers
   E. The tax falls more on listers
   F. None of the above

   5. ____________

6. (3 points) Wakanda is a small nation producing both shields and Vibranium in the world economy. Following recent changes in the world price of shields, it specializes in Vibranium production. What must have happened in the world market for shields? Assume world market for Vibranium is unaffected.

   I. Demand for shields in the world market increased

   II. Supply of shields in the world market decreased

   A. I only B. II only C. I and II D. Neither I nor II

   6. __________

7. (3 points) Consider the perfectly competitive market for dry cleaning. Suppose the market demand is perfectly inelastic and the market supply is upward sloping. In addition, suppose the dry cleaning process yields air pollution. Which of the following statements **must** be true?

   A. The government can increase the social surplus by imposing a per unit tax.
   B. If the government imposes a per unit tax, the producer surplus will decrease.
   C. If the government imposes a per unit tax, the consumer surplus will increase.
   D. All of the above statements in A,B, and C are correct.
   E. None of the above statements in A,B, and C are correct.

   7. __________

8. (3 points) Consider a single price monopolist facing a downward sloping demand and positive marginal cost. Suppose it raises the price a little bit. Which of the following statements must be true?

   A. Both revenue and profit will increase.
   B. Both revenue and profit will decrease.
   C. The revenue will increase, but the profit will decrease.
   D. The revenue will decrease, but the profit will increase.

   8. __________

9. (3 points) The market for cereal is monopolistically competitive. Which of the following is true in long-run equilibrium?

   A. Firms maintain a positive profit through product differentiation.
   B. Firms choose to produce the quantity at which their marginal cost equals the market price.
   C. A firm's demand curve is tangent to its average total cost curve.
   D. As firms producing imperfect substitutes enter the market, a firm's demand becomes more inelastic.

   9. __________

10. (3 points) Consider a single price monopolist in the market for Portland cement, facing market demand $P = 12 - Q^D$, and marginal costs $MC = Q$. Producing Portland cement generates pollution amounting to a marginal external cost of \$2. If the government wants to restore social efficiency, which of the following is true?

    A. The monopolist is overproducing and should be taxed to account for the pollution
    B. The monopolist is overproducing and should be subsidized to account for the pollution
    C. The monopolist is underproducing and should be subsidized to account for the pollution
    D. The monopolist is underproducing and should be taxed to account for the pollution
    E. No government intervention is needed as the monopolist is already producing the efficient quantity

    10. __________

11. (3 points) Kellogg's and General Mills are currently each charging a low price, p_L, for their cereals. The CEOs of Kellogg's and General Mills meet to discuss colluding on a higher price, p_H. If both firms cooperate and charge p_H, each firm gains \$4 million in profits. If one firm charges p_L while the other charges p_H, the low-pricing firm gains \$8 million in profits and the high-pricing firm loses \$1 million in profits. If both firms continue charging p_L, there is no change in their profits. Which of the following is true?

    I. The pricing game is a prisoner's dilemma

    II. There is a unique Pareto efficient Nash equilibrium

    III. Each firm's dominant strategy is to charge the high price, p_H

    A. Only I B. Only II C. Only III D. I and II E. I and III F. II and III G. I, II and III

    11. ________

12. (3 points) Amy, Bob, and Carl, are the only citizens of Econville and are considering building a bridge to Econtropolis. Amy values the bridge at \$1, Bob at \$2, and Carl at \$3. They all value no bridge being built at \$0. Suppose the bridge costs \$3 to build. Which of the following is a Pareto efficient outcome?

    I. All citizens pay \$1 and the bridge is built

    II. Carl pays \$3 and the bridge is built

    III. Amy and Bob pay \$1.50 and the bridge is built

    A. Only I B. Only II C. Only III D. I and II E. I and III F. None of the above

    12. ________

13. (3 points) Econ-Mart, a firm that produces economics lectures, is a monopsonist facing an upward sloping labor supply curve for economists. In an effort to protect economists, the government had imposed a minimum wage that restored market efficiency. Recently, demand for economics lectures has *slightly* increased as more people want to understand trade policy. Which of the following is now true about equilibrium wages and labor quantity, as well as market efficiency?

    A. Wages have risen, labor has risen, the market is efficient
    B. Wages have risen, labor has risen, the market is inefficient
    C. Wages are unchanged, labor has risen, the market is efficient
    D. Wages are unchanged, labor is unchanged, the market is inefficient

    13. ________

14. (3 points) Which of the following is **not** a policy that reduces economic inequality?

    A. Progressive income tax
    B. Unemployment insurance
    C. Sales tax
    D. Public school system

    14. ________

Short Answer Questions (61 points total)

To get any point you must show your work.

15. Suppose the market for coffee in Philadelphia is characterized by demand $Q^d = 1000 - 10P$. Individual coffee shops are identical with total costs $TC = 5 + 5q^2$ and marginal costs $MC = 10q$.

    (a) What is the individual short-run supply curve equation for a coffee shop? Show your work.

    (b) Suppose the market for coffee is in a long-run equilibrium. What is the market price, firm output, number of firms, and market output? Show your work.

    (c) What is the market supply equation? Is supply elastic, inelastic, or unit-elastic? Show your work.

(d) What are consumer surplus, producer surplus, and total surplus? Show your work.

(e) Suppose the government has introduced a tax on coffee of \$5 per cup. Now what are the equilibrium prices (price paid by buyers and price kept by sellers), quantity, and deadweight loss? Show your work.

(f) What effect will this policy have in the long-run? Explain.

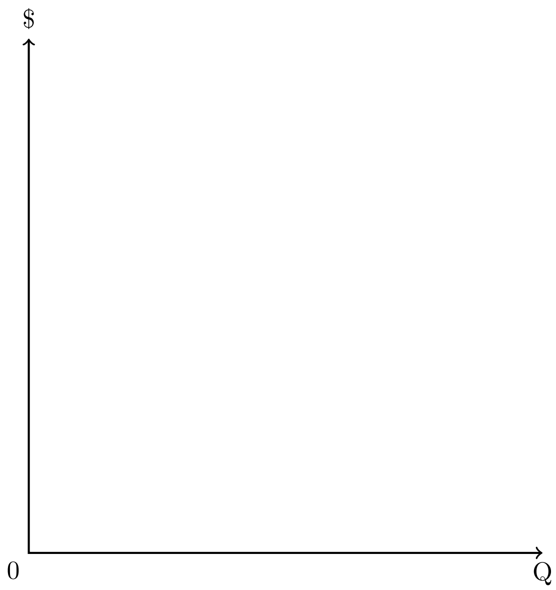
16. Amy and Ben are the only citizens of the small town of Econville. They have asked the government to build a park in the town. Their individual marginal benefits (MB) are given by:

- Amy : $MB_A = 60 - 2Q$
- Ben : $MB_B = 40 - 0.5Q$

where Q is the square footage of the park (ft^2). The cost of building the park is constant at $MC = \$20$ per square foot, and there is no fixed cost. Note that we assume the park is a public good.

(a) State the problem that arises in the market provision of a public good. What is the characteristic of public goods that is associated with this problem?

(b) On the graph below, draw the marginal cost (MC), as well as Amy's and Ben's marginal benefits. Label Amy's MB_A and Ben's MB_B. Make sure to label all intercepts.



(c) Find the social marginal benefit (*you should write down the exact equation*) and draw it on the graph above. Label it SMB and make sure to label all necessary points.

(d) Suppose the government has no budget to build the park, so it imposes an equal contribution of \$10 per square foot on both Amy and Ben. What is the size of the park each person wants under this policy? Show your work.

(e) What is the socially efficient size of the park Q_E? Show your work.

(f) Find the total willingness to pay of each person for the efficient size Q_E. Show your work.

(g) Suppose now that each of them should pay a proportion x of his/her total benefit to finance the park. What is the minimum proportion x necessary to finance the efficient quantity? *If you could not solve part (e), express it as a function of the efficient size Q_E, Amy's total benefit TB_A and Ben's total benefit TB_B.*

17. Suppose that the market for electric car workers is characterized by a downward-sloping labor demand curve and an upward-sloping labor supply curve.

    (a) On the graphs below, draw the labor supply and demand at the market level on the left hand side and at the firm level on the right hand side. Label the equilibrium market wage w^* and market employment L^*, the individual firm's employment l^* and the unemployment level.

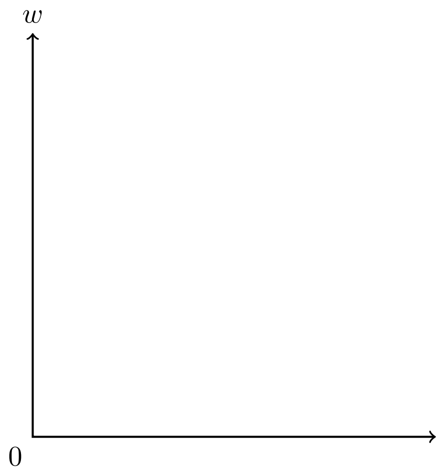


Figure 1: **Market for labor**

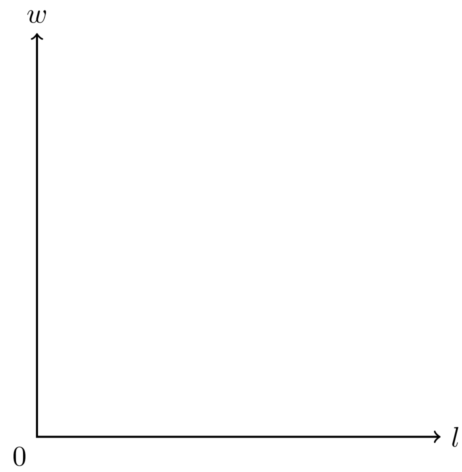


Figure 2: **Individual Firm**

    (b) Environmentally conscious consumers lobby the government to make electric cars more affordable, so the government decides to impose a binding price ceiling in the market for electric cars. What is the impact of this price control on the market for electric cars, and on the market for electric car workers? Show the first and second round effect (i.e. the "feedback effect") on the graphs below, assuming the price ceiling always remains binding.

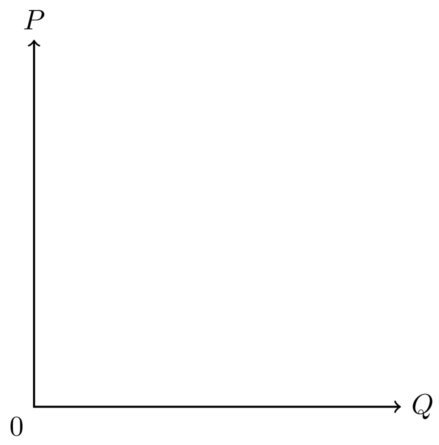


Figure 3: **Market for electric cars**

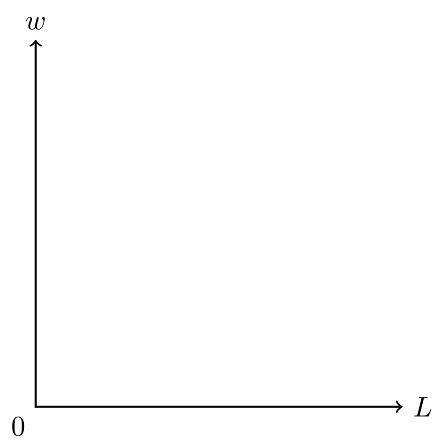
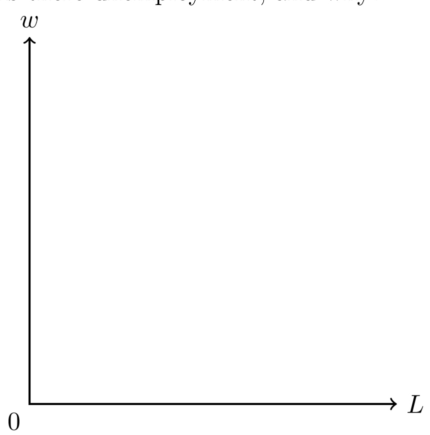


Figure 4: **Market for electric car workers**

(c) Worried about the impact of the price ceiling on wages of electric car workers, the government decides to impose a binding minimum wage in the market for electric car workers. Describe (in words) how this minimum wage regulation affects the wage and levels of employment and unemployment of electric car workers.

(d) Suppose the electric car producers unite into an employers' organization and coordinate their actions in the labor market so that now they behave as a single employer. The government asks its chief economist to analyze the effect of the minimum wage in this new situation.

i. To begin with, draw the employer's individual labor supply and demand and marginal cost curves below, **in the absence of a minimum wage**. Label the monopsony wage and level of employment. Is there unemployment, and why?



ii. Suppose the chief economist concludes that the minimum wage will actually increase employment, and at the same time generate unemployment. In your graph above, show the level of the minimum wage that confirms this conclusion.

(e) Suppose the minimum wage is removed. Moreover, the employers' organization of electric car producers is dismantled by the government, so that the market for electric car workers is back to perfect competition. To retaliate, electric car producers decide to collude and behave like a monopoly in the market for electric cars. How does this affect the equilibrium wage and employment of electric car workers? Explain.