Part I

1.1 (3 points)
Attendance at Penn Football games is free for Penn students. Nonetheless not all students attend the games. What economic concept helps explain this result? (no explanation needed).

Opportunity Cost (of time).

1.2 (7 points)
Both Karen and Chuck like reading old books and listening to old records. To get these items, they must spend time looking for them. Suppose that we know that each month they can find the following amounts of books and records:

<table>
<thead>
<tr>
<th></th>
<th>Books</th>
<th>Records</th>
</tr>
</thead>
<tbody>
<tr>
<td>Karen</td>
<td>15</td>
<td>45</td>
</tr>
<tr>
<td>Chuck</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

a. Who has the absolute advantage in book finding? Karen (1 point)

b. Who has the comparative advantage in book finding? Chuck (2 points)

c. If Karen & Chuck combine their resources what will their joint PPF be? Please put books on X-axis.

Kinked PPF. Points at (25,0), (0,55), and (10, 45).
1 point for general shape plus 1 point each. Total 4 points.
1.3 (22 points)

The price of personal computers has declined significantly in the last two decades. At the same time, the quantity of personal computers exchanged in the market has increased. This question asks you to analyze why this may have happened using the demand/supply model you studied in class.

a. Draw a typical supply and demand graph for personal computers. Label the equilibrium price and quantity of personal computers.

Downward sloping demand (1 point), upward sloping supply (1 point), eqbm price and quantity labeled (1 point each).
Total: 4 points.

b. Jenny, one of your classmate, says that the developments in the market for personal computers over the last 20 years might be explained by the increase in disposable income of US families. Show graphically how the increase in income affects the market for personal computers. What assumption are you making to answer this question? Do you agree with Jenny that this would explain the changes in the market described above?

Assuming that computers are a normal good (2 point), the increase in disposable income shifts the demand curve outward (1 point). This would be consistent with the increase in the quantity of computers sold (1 point) but not with the fall in the price of computers (1 point), as the graph should show a rise in the eqbm price (1 point).
Total: 6 points.

c. Another of your classmates, Mark, suggests that technological improvements in the production of computers are behind the trends listed above. What are the effects of these types of advances in the market for personal computers? Show graphically. Can they explain the decrease in price and increase in quantity that we have observed in recent decades?

A technological improvement will shift supply curve outward (2 points). Eqbm price falls (1 point) and quantity increases (1 point), consistent with the initial observations about the computer market (2 point).
Total: 6 points.
d. You have read in a newspaper article that revenues for the producers of personal computers have increased substantially in the last two decades, even though prices for personal computers went down. How is that possible? What does this information tell you about the shape of the demand function in this market? Do you need additional information to answer this last question? Explain.

This is possible if the demand curve is elastic (3 points) over the prices and quantities from the initial eqbm to the eqbm after the change in part c. In that case the percentage increase in quantity will be greater than the percent decrease in price and revenues will increase. (3 points for explanation)

Total: 6 points

Comment: many possible acceptable explanations, including graph of TR, MR or link to definition of elasticity.
Part II

2.1 (16 points)
The government of Wonderland has an electricity generation plant that requires uranium to generate power. Assume that the demand for electricity is downward sloping. Ignore externalities throughout this question.

a) The graph below plots the supply curve for electricity in Wonderland. Add a demand curve that is consistent with the fact that the equilibrium price (per kw) is 2.

**Downward sloping demand curve that intersects supply at $P = 2$. 2 points.**

b) The government of Wonderland is about to implement a subsidy of 1 (per kw) in the electricity market in the west part of Wonderland. Based on the demand curve you drew, label the new equilibrium price and quantity.

**New demand curve shifted up by 1 or supply curve shifted down by 1 (2 points: 1 for correct direction. 1 for correct height). Either way, new producer price**
between 2 and 3 (1 point) and consumer price between 1 and 2 (1 point). Quantity between 1000 and 1500 (1 point).

Total 5 points. Loose 1 point if don’t distinguish between price to consumer & producer.

c) Label consumer surplus and producer and surplus if the subsidy is imposed.

Assuming supply curve is shifted, PS is space from old supply curve up to new eqbm producer price and over to new eqbm q (2 points). CS is space below the demand curve and, above consumers' price, and over to new eqbm quantity (2 points).

4 points.

2 points if wrong but consistent with P from part b.

d) Label consumer’s share of subsidy and the producer’s share of subsidy.

Consumers share: rectangle bounded below by their price, above by the original eqbm price and over to new eqbm quantity. 1 point.

Producers share: rectangle bounded above by their price, below by new eqbm price, and over to the new eqbm quantity. 1 point.

2 points.

e) In implementing the subsidy the government states “the subsidy will help consumers during these hard times without any harm to society at large”. Do you agree with this statement?

Consumers will indeed benefit from lower prices & their consumer surplus increases [1 point], but society as a whole suffers as there is dead weight loss [2 points].

3 points.
2.2 (18 points)

Consider the market for corn in the United States. In this market, there are many farmers producing corn and a great portion of the US population eats it. Furthermore, we may assume that all corn tastes exactly the same regardless of the manufacturer.

a. With the description above, which market structure would you consider the corn market to be characterized by? Explain.

The production of corn can be characterized as perfectly competitive (1 point). There are many corn producers (1 point) and they all make an identical product (1 point).
3 points.

b. Consider one firm operating in this market, Cornit. Cornit is currently making losses. However, Cornit is still continuing to operate, that is, it does not want to shut down. Please graph the standard Marginal Revenue, Marginal Cost, Average Total Cost and Average Variable cost curves consistent with the above facts. Graphically show the quantity at which Cornit is producing and the losses it is making.

Usual picture. Upward sloping MC curve (1/2 point) intersects U-shaped ATC and AVC curves at their minimum points (1/2 point). AVC strictly below ATC but the vertical distance between the two decreases as quantity increases (1 point) (note: total 2 points for correct cost curves)
MR a horizontal line at a price such that MR intersects MC with MR above AVC but below ATC (1 point). Cornit produces at q* where MR = MC (1 point). Losses: rectangle bounded above by MR curve, below by ATC curve at q* and over to q* (1 point).
5 points
c. What happens to this market in the long run? Be sure to discuss any changes in the price level, the quantity produced by an individual farmer, the number of firms in the market and the losses a farmer is incurring.

In the long run firms exit (1/2 point). Eqbm price rises (as supply shifts in) and hence MR curve rises until MR intersects MC at ATCs min point (1/2 point). Firms break even (1 point) and each firm produces a larger quantity than before (1 point). 3 points.

d. Now suppose that the Cornit executives are able to negotiate lower rates for leasing farm equipment. Such leasing expenditure is a fixed cost for a farmer. How does this change affect the Marginal Cost, Average Variable Cost, Average Total Cost curves?

MC and AVC unchanged (1/2 point each). ATC shifts down everywhere (1 point). (Note: fixed costs only affect ATC).
2 points.

e. How would the change in part d affect the farmer’s output decision in the short run?

No short run effect (since MC, AVC, MR unchanged).
2 points.

f. If all farmers faced lower lease costs, what would happen to the long-run equilibrium price, quantity produced by an individual Corn manufacturer and the number of firms in the corn market compare to the ones you found in part c)?
Long run eqbm price will drop to new Min ATC (1 point). The quantity produced by an individual farmer will be lower (1 point). The number of firms proding in the industry will increase. We know this because each farmer is producing less but consumer, at the lower price, demand more 1 point).
3 points.
PART 3:

3.1 (17 points)
Suppose we want to use an economic model to represent the market for new sedan-style cars in the United States.

a) Monopolistic competition seems like a good choice of model to use here. In one sentence, what makes this model a better choice than the perfect competition model?

The sedan market is characterized by multiple firms, each producing a differentiated product, competing with each other on price and quality.
2 points- for product differentiation.

b) Now that we have decided to use the monopolistic competition model, suppose we consider one particular producer, VoomCars, who produces a single type of sedan: the VoomMobile. Draw a graph with curves representing the situation faced by VoomCars. Make your graph large, as many of the remaining questions deal with adding to it. Read all the following instructions before proceeding.

* Your graph should contain the following curves, labeled as indicated in parenthesis: Marginal Cost (MC), Average Total Cost (ATC), Demand (D), Marginal Revenue (MR). Do not draw any other curves than these.
* Draw the curves such that if VoomCars is maximizing profits, its profits are positive.

Downward sloping Demand and downward sloping MR strictly inside D (1 point).
Upward sloping MC (1 point), U-shaped ATC and MC intersects ATC at min point (1 point). Profits maximized by setting MC = MR for q* (1 point) and price p* comes from demand curve at this quantity (1 point). P* needs to be above ATC at q* (1 point).
6 points.

c) Now assume that VoomCars is maximizing its profit, and is producing 1,000 VoomMobiles that are sold at $7,000 each. Their profit is $2,000,000. On your graph, mark the quantity produced, the price VoomCars are sold at, the area of the graph that represents the economic profit of VoomCars, and the area that represents the total cost of VoomCars. What is the numerical amount of the total cost?
Label \( q^* \) as 1000 (1 point) and \( p^* \) as 7000 (1 point). Profits, box from \( q=0 \) to \( q=1000 \) and \( p=7000 \) to \( p = p' = ATC(q^*) \) (2 points). Solve for \( p' \) from knowing profit. \( ATC = P' = 5000 \) (1 point) which makes Total Cost = 5,000 \( \times 1,000 = 5,000,000 \) (1 point) Total: 6

d) There is no part d. Sorry.

e) Assume now that the market has reached a long-run equilibrium. Explain one way in which this outcome is not efficient.

The firm is not producing at minimum ATC

Or

At the equilibrium MB>MC (there is DWL)

3 points for either. 1 for correct statement + 2 for explanation.
3.2 (17 points)
This question is about the market for house ownership (not renting).

a. Suppose the demand for purchasing houses and the supply of selling houses are all standard. Draw the supply and demand curves for houses and mark the market equilibrium price and quantity of houses.

**Standard supply and demand graph.**

2 points.

b. The Economist Oswald found that there is a positive relationship with housing ownership and the labor market unemployment rate in Europe. That is, if there are more people who own their houses, then the country suffers a higher unemployment rate than others.

(Source: De Graaff and Van Leuvensteijn, "The Impact of Housing Market Institutions on Labour Mobility: A European Cross-Country Comparison")

He suggested that this phenomenon comes from the fact that house-owners are locked in their local economy. Since they have less mobility than others, home-owners are actually hurting economy’s labor market efficiency.

From now on, let's assume the above statement is correct. That is, increasing the number of housing owners causes a deterioration in the labor market. If we consider this effect of housing ownership on labor market inefficiency, what would be the true social marginal benefit curve of housing ownership? Add this to your graph from part a.
Add a SMB curve below the demand curve, because of the negative externality of home ownership. (note if students shifted MC up that is ok too)
3 points.

c. What is the socially optimal equilibrium in the housing ownership market?
Clearly mark the socially efficient quantity and price of house-ownership. Show Dead Weight Loss if you think it exists. Compare the total surpluses of the original market equilibrium and socially optimal equilibrium.

Socially efficient quantity at intersection of S and SMB (1 point). Lower quantity than the competitive equilibrium (1 point). DWL is the triangle from the market outcome leftward to efficient quantity at D and SMB (2 point). The total surplus is smaller in the market equilibrium (2 points), explanation as to *why* the surplus is smaller (loss of efficiency/reference DWL) (1 point). Total: 7 points

d. How would the new equilibrium unemployment rates with efficient housing market compare to the current unemployment rate? Would it be higher, lower, or the same compared to the previous market equilibrium? Why?

With an efficient housing market the unemployment rate would be lower (1 point) as fewer consumers would own homes and thus there would be greater mobility in the labor market (2 points).
3 points.

e. Governments try to subsidize households for purchasing their own houses, do you think such a policy makes sense in light of the above result? Why or why not?

Subsidies increase the number of consumers that own their homes (1 point) and thus, based on the information above, increase the rigidity in the labor market, this leads to socially inefficient amounts of home ownership and unemployment (1 point).
2 points.

End of Exam. Well done.