

## ***Unit 10. Public Goods, Externalities, and the Role of Government***

### **Free response questions**

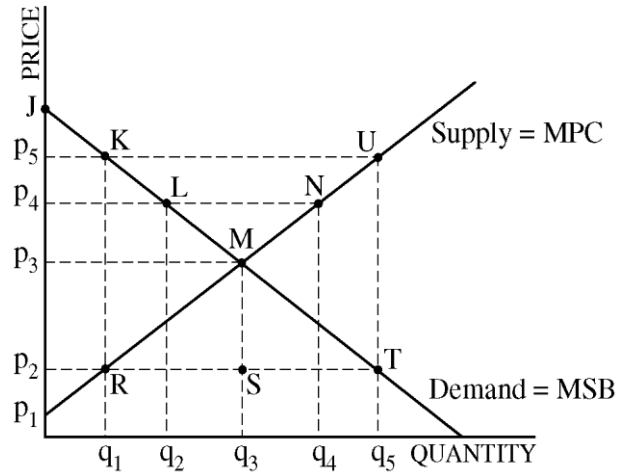
#### **APT 2011**

3. Assume that the market for good X is perfectly competitive and that the production of good X creates a negative externality.
- (a) Draw a correctly labeled graph of the market for good X and show each of the following.
    - (i) The marginal private cost and marginal social cost of good X, labeled MPC and MSC, respectively
    - (ii) The market quantity, labeled  $Q_m$
    - (iii) The allocatively efficient quantity, labeled  $Q_s$
    - (iv) The area of deadweight loss, shaded completely
  - (b) Assume that a lump-sum tax is imposed on the producers of good X. What happens to the deadweight loss? Explain.

#### **APT 2011 (Form B)**

2. Suppose research shows that the more college education individuals receive, the more responsible citizens they become and the less likely they are to commit crimes.
- (a) Draw a correctly labeled graph for the college education market and show each of the following.
    - (i) Private market equilibrium quantity and price of college education, labeled  $Q_m$  and  $P_m$ , respectively
    - (ii) Socially optimal quantity of education, labeled  $Q_s$
    - (iii) Deadweight loss at the market equilibrium, completely shaded
  - (b) Assume that the government imposes an effective (binding) price ceiling on the price of college education.
    - (i) Show the price ceiling on your graph in part (a), labeling the price ceiling  $P_c$ .
    - (ii) Does this price ceiling increase, decrease, or have no impact on the deadweight loss in this industry? Explain.
  - (c) Assume that instead of the price ceiling, the government grants each student a subsidy for each unit of college education purchased. Will the new equilibrium quantity of college education purchased be greater than, less than, or equal to  $Q_m$  from part (a) ?

## APT 2010



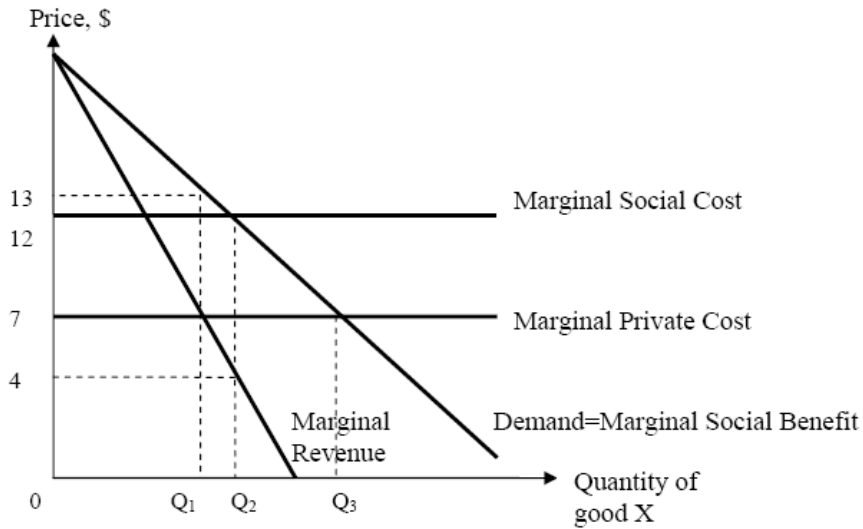
3. The graph above shows the perfectly competitive market for hard candies in Country Alpha. In the graph the letters correspond to points, not areas. MPC denotes marginal private cost and MSB denotes marginal social benefit.
- Using the labeling on the graph, identify the area representing each of the following at the market equilibrium.
    - The consumer surplus
    - The producer surplus
  - Assume that the production of each unit of candy creates a negative externality equal to  $(p_5 - p_2)$ . Using the labeling on the graph, identify the socially optimal quantity.
  - Assume that the government imposes a per-unit tax of  $(p_5 - p_2)$  to correct for the negative externality. Using the labeling on the graph, identify the area representing each of the following.
    - The consumer surplus
    - The deadweight loss

## APT 2008 (Form B)

2. Vaccinations for contagious diseases benefit the consumers as well as others in the community. Assume that vaccines are produced in a competitive market.
- Draw a correctly labeled graph of supply and demand, and
    - label the market price " $P_m$ ", and label the market output " $Q_m$ ".
    - label the socially efficient level of output " $Q_s$ ".
    - shade the area of the deadweight loss.
  - Is marginal social cost greater than, less than, or equal to marginal social benefit at the market output?
  - How will a tax on producers of the vaccines affect the deadweight loss that you identified in part (a) (iii)? Explain.

## APT 2004 Q 1

The production of good X creates an externality. The following questions are based on the graph below, which shows the marginal revenue, marginal social benefit, marginal private cost, and marginal social cost associated with the production of good X.



- Is the externality positive or negative? Explain.
- Using labeling from the graph above, identify the socially optimal output. Explain how you determined your answer.
- Suppose that good X is produced by a profit maximizing monopoly. Answer each of the following.
  - Using labeling from the graph above, identify the unregulated firm's output. Explain how you determined your answer.
  - To produce the socially optimal output, indicate whether the government should tax or subsidize the firm.
  - Calculate the dollar value of the needed per-unit tax or subsidy.