Chapter 1: Answers to Questions and Problems

1. Producer-producer rivalry best illustrates this situation. Here, Southwest is a producer attempting to steal customers away from other producers in the form of lower prices.

2. The maximum you would be willing to pay for this asset is the present value, which is

$$PV = \frac{250{,}000}{(1+0.08)} + \frac{250{,}000}{(1+0.08)^2} + \frac{250{,}000}{(1+0.08)^3} + \frac{250{,}000}{(1+0.08)^4} + \frac{250{,}000}{(1+0.08)^5}$$
$$= \$998{,}177.51$$

3.
   a. Net benefits are $N(Q) = 20 + 24Q - 4Q^2$.
   b. Net benefits when Q = 1 are N(1) = 20 + 24 – 4 = 40 and when Q = 5 they are $N(5) = 20 + 24(5) - 4(5)^2 = 40$.
   c. Marginal net benefits are MNB(Q) = 24 – 8Q.
   d. Marginal net benefits when $Q = 1$ are MNB(1) = 24 – 8(1) = 16 and when $Q = 5$ they are MNB(5) = 24 – 8(5) = -16.
   e. Setting MNB(Q) = 24 – 8Q = 0 and solving for Q, we see that net benefits are maximized when Q = 3.
   f. When net benefits are maximized at Q = 3, marginal net benefits are zero. That is, MNB(3) = 24 – 8(3) = 0.

4.
   a. The value of the firm before it pays out current dividends is

$$PV_{firm} = \$400{,}000\left(\frac{1+0.06}{0.06-0.04}\right)$$

$$= \$21.2 \text{ million.}$$

   b. The value of the firm immediately after paying the dividend is

$$PV_{firm}^{Ex-Dividend} = \$400{,}000\left(\frac{1+0.04}{0.06-0.04}\right)$$

$$= \$20.8 \text{ million.}$$

5. The present value of the perpetual stream of cash flows. This is given by

$$PV_{Perpetuity} = \frac{CF}{i} = \frac{\$125}{0.05} = \$2{,}500$$

6. The completed table looks like this:

Control Variable Q	Total Benefits B(Q)	Total Cost C(Q)	Net Benefits N(Q)	Marginal Benefit MB(Q)	Marginal Cost MC(Q)	Marginal Net Benefit MNB(Q)
100	1200	950	250	210	60	150
101	1400	1020	380	200	70	130
102	1590	1100	490	190	80	110
103	1770	1190	580	180	90	90
104	1940	1290	650	170	100	70
105	2100	1400	700	160	110	50
106	2250	1520	730	150	120	30
107	2390	1650	740	140	130	10
108	2520	1790	730	130	140	-10
109	2640	1940	700	120	150	-30
110	2750	2100	650	110	160	-50

a. Net benefits are maximized at $Q = 107$.
b. Marginal cost is slightly smaller than marginal benefit ($MC = 130$ and $MB = 140$). This is due to the discrete nature of the control variable.

7.

a. The net present value of attending school is the present value of the benefits derived from attending school (including the stream of higher earnings and the value to you of the work environment and prestige that your education provides), minus the opportunity cost of attending school. As noted in the text, the opportunity cost of attending school is generally greater than the cost of books and tuition. It is rational for an individual to enroll in graduate when his or her net present value is greater than zero.
b. Since this decreases the opportunity cost of getting an M.B.A., one would expect more students to apply for admission into M.B.A. Programs.

8.

a. Her accounting profits are $170,000. These are computed as the difference between revenues ($200,000) and explicit costs ($30,000).
b. By working as a painter, Jaynet gives up the $110,000 she could have earned under her next best alternative. This implicit cost of $110,000 is in addition to the $30,000 in explicit costs. Since her economic costs are $140,000, her economic profits are $200,000 - $140,000 = $60,000.

9.

a. Total benefit when $Q = 2$ is $B(2) = 20(2) - 2*2^2 = 32$. When $Q = 10$, $B(10) = 20(10) - 2*10^2 = 0$.
b. Marginal benefit when $Q = 2$ is $MB(2) = 20 - 4(2) = 12$. When $Q = 10$, it is $MB(10) = 20 - 4(10) = -20$.
c. The level of Q that maximizes total benefits satisfies $MB(Q) = 20 - 4Q = 0$, so $Q = 5$.
d. Total cost when $Q = 2$ is $C(2) = 4 + 2*2^2 = 12$. When $Q = 10$ $C(Q) = 4 + 2*10^2 = 204$.
e. Marginal cost when $Q = 2$ is $MC(Q) = 4(2) = 8$. When $Q = 10$ $MC(Q) = 4(10) = 40$.
f. The level of Q that minimizes total cost is $MC(Q) = 4Q = 0$, or $Q = 0$.
g. Net benefits are maximized when $MNB(Q) = MB(Q) = MC(Q) = 0$, or $20 - 4Q - 4Q = 0$. Some algebra leads to $Q = 20/8 = 2.5$ as the level of output that maximizes net benefits.

10.

a. The present value of the stream of accounting profits is

$$PV = \frac{(120{,}000 - 40{,}000}{1.05} + \frac{(120{,}000 - 40{,}0}{(1.05)^2} + \frac{(120{,}000 - 40{,}0}{(1.05\ ^3} = \$217{,}859.8$$

b. The present value of the stream of economic profits is

$$PV = \frac{(120{,}000 - 40{,}000 - 55{,}000}{1.05} + \frac{(120{,}000 - 40{,}000 - 55{,}000)}{(1.05\ ^2} + \frac{(120{,}000 - 40{,}000 - 55{,}000)}{(1.05)^3} = \$68{,}081.20$$

11. First, recall the equation for the value of a firm: $PV_{firm} = \pi_0 \left(\frac{1+i}{i-g}\right)$. Next, solve this equation for g to obtain $g = i - \frac{(1+i)\pi_0}{PV_{firm}}$. Substituting in the known values implies a growth rate of $= 0.09 \quad \frac{(1+0.09)11{,}000}{300{,}000} = 0.05$ or 5 percent. This would seem to be a reasonable rate of growth: $0.05 < 0.09$ ($g < i$).