Chapter 1

Answer 2)

The maximum amount you would pay is:

\[
\frac{150000}{1.09} + \frac{150000}{1.09^2} + \frac{150000}{1.09^3} + \frac{150000}{1.09^4} + \frac{150000}{1.09^5} = \sum_{n=1}^{5} \frac{150000}{1.09^n} = 583,448.
\]

Answer 3)

a) The net benefits are:

\[
B(Q) - C(Q) = (150 + 28Q - 5Q^2) - (100 + 8Q) = 50 - 20Q - 5Q^2
\]

b) When \(Q = 1\),

\[NB(Q) = 50 - 20 - 5 = 25\]

When \(Q = 5\),

\[NB(Q) = 50 - 100 - 125 = -175\]

c) The marginal net benefits are:

\[MB(Q) - MC(Q) = (28 - 10Q) - (8) = 20 - 10Q\]

d) When \(Q = 1\)

\[MNB(Q) = 10\]

When \(Q = 5\)

\[MNB(Q) = -30\]
e) We maximize net benefits when:

\[ MNB(Q) = 0 \]

\[ 20 - 10Q = 0 \]

\[ 20 = 10Q \]

\[ Q = 2 \]

f) The value of marginal net benefits is zero.

5) What is the value of a preferred stock that pays a perpetual dividend of $75 at the end of each year when the interest rate is 4 percent?

\[ PV_{\text{perpetuity}} = \frac{CF}{i} = \frac{75}{0.04} = 1875 \]

6) In order to do this question
   Net benefits is equal to total benefits less total costs
   Marginal net benefit is equal to marginal benefit less marginal cost
   Marginal benefit is the additional benefit obtained from increasing one unit of output.
   Marginal cost is the additional cost of increasing one unit of output.
   Net benefits are maximized when the marginal net benefit is zero.

8) Jaynet sells 20 paintings a year at a price of $10,000 each. She spends $20,000 on storage of supplies etc. Therefore, she makes an accounting profit of $200,000 (20 * $10,000) - $20,000 = $180,000. She makes an economic profit of $180,000 - $100,000 = $80,000. We should remember that although Jaynet received two offers, she cannot work at both places instananeously. Therefore, we choose the best offer as her opportunity cost. She could be making $100,000 at a famous marketing firm.

10) Let us calculate the present value of $25. If the present value is greater than $100 (the savings we need to generate in order to make the more expensive option worthwhile), we will purchase the refrigerator.

\[ \sum_{n=1}^{5} \frac{25}{1.05^n} = $108.24 \]

We purchase the $500 refrigerator and we save $8.24 total.

12) Her accounting costs is $3,160,000. Her implicit costs is $56,000. The opportunity cost is $3,160,000 + $56,000 = $3,216,000.
In order to make positive accounting profits she needs to generate a revenue of $3,160,000. She needs to make an economic profit of $3,216,000.

15) Value of the firm:

\[ PV_{firm} = \pi_0 \sum_{n=1}^{\infty} \frac{(1 + g)}{(i - g)} = \pi_0 \frac{1}{1 - \frac{1 + g}{1 + i}} = \pi_0 \frac{1 + i}{1 + i - 1 - g} = \pi_0 \frac{1 + i}{i - g} \]

a) If the profits grow at 10%
   \( i = 8\% \) and \( g = 10\% \):

\[ \$2.5 \left( \frac{1.08}{0.08 - 0.1} \right) \]

As the growth rate is greater than the interest rate, the profits grow at a greater rate than they are discounted and thus no maximization occurs.

b) Profits grow at 3%.

\[ \$2.5 \left( \frac{1.08}{0.08 - 0.03} \right) \]

\[ = \$54bn \]

c) Profits grow at 0%.

\[ \$2.5 \left( \frac{1.08}{0.08} \right) \]

\[ = \$33.75bn \]

*d) Profits decline at 3%

\[ \$2.5 \left( \frac{1.08}{0.08 + 0.03} \right) \]

\[ = \$24.545bn \]

17) Total Revenues goes up a bit less than $10 million. Total variable costs go up a bit more than $4 million and your foreign operations lose $6 million. It seems you may end up losing more money than generating revenue and thus this could imply a loss to the firm. So it may be sensible not to undertake the new advertising campaign.

20) Open ended answer.

If you sell goods for less, you can attract consumers. Depending on size of business, it may be difficult to sell goods at a lower price. Unnecessary costs incurred if strategy fails.