100 points. Please write answers in ink, but do graphs and figures in pencil.

1. a. You operate South Carolina’s only fortune cookie manufacturing establishment. To keep pace with growing demand, you purchase a new dough squeezer for $5,000. You estimate its resale value at the end of 2 years as $1,500 and its operating expenses as $6,000 per year payable at the end of each year. At an interest rate of 10%, what is the total cost of buying and using the machine for 2 years?

\[
PV = 5000 + \frac{6000}{1.10} + \frac{6000}{(1.10)^2} - \frac{1500}{(1.10)^2} = 5000 + 5454.60 + 4958.40 - 1239.60 = 14,173.40
\]

b. Part of the advantage of owning a home is that interest payments are tax deductible. That is, you may reduce your taxable income by an amount equal to your annual interest payments. For simplicity, assume all interest is paid at the end of a year. Suppose after applying a down payment to a home, you still need a $60,000 mortgage loan. The loan is payable over 30 years, in 30 equal annual installments beginning one year from now, at a 7% interest rate.
   i. How large is each payment?
   ii. What is the amount of interest owed at the end of the first year?
   iii. How much do you still owe after making the first year’s payment?

\[
i. \quad 60000/(12.409) = 4835.20 \\
\text{ii.} \quad 60000(0.07) = 4200 \\
\text{iii.} \quad 60000(0.07) - 4835.20 = 59,364.80
\]

c. You are considering buying a new refrigerator. You have two models to choose from: Brand A and Brand B. Brand A is less expensive, but it is more costly to operate. Both Brand A and Brand B have an expected life of 10 years. Using the numbers from the table below calculate which is the better buy if the interest rate is 6%?

<table>
<thead>
<tr>
<th>Refrigerator</th>
<th>Purchase Price ($)</th>
<th>Annual Energy Cost ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brand A</td>
<td>600</td>
<td>250</td>
</tr>
<tr>
<td>Brand B</td>
<td>950</td>
<td>200</td>
</tr>
</tbody>
</table>

Present value of the cost of A = \(600 + 250(7.3601)\) [from Table 11-3] = $2,440.03
Present value of the cost of B = \(950 + 200(7.3601)\) [from Table 11-3] = $2,422.02
B costs less than A because of the lower operating costs.

2. A retail liquor license in Montana was recently sold for over $110,000. The seller was the person who initially got the license from the state of Montana at a price of $2,225.
   a. Can the buyer of the license expect to make a rate of return that is greater than the normal rate of return, thereby earning economic profits? Can the buyer expect to make an accounting profit? Explain.
He cannot expect more than the normal rate of return, and therefore he anticipates earning zero economic profits. Of course, because of uncertainty, he may end up earning more than he anticipates, thereby realizing economic profits. Because economic costs account for opportunity costs, the buyer does expect to make accounting profits equal to the normal rate of return in this industry.

b. Is it likely that the seller of the license made more than the normal rate of return during the time he was selling liquor? Explain.

The seller likely did not earn more than the normal rate of return. Although business was obviously good—as indicated by the appreciation of the value of the liquor license—once the owner took into account the opportunity cost of continuing to operate with a license that had increased in value, his accounting profits probably guaranteed him no more than the normal rate of return in this industry.

3. If you found that you could reduce your bills for groceries 10 percent by buying exclusively from on-line stores, would you do it? Why would some people be unwilling to take advantage of this “saving”? Explain what people are doing when they “shop” at stores.

People often go shopping to acquire information about what's available. They don't set out to buy what they want so much as to find out what they want to buy. A website is less useful for this purpose than a tour of the local grocery stores.

4. Suppose that while digging in your backyard to plant flowers you strike oil. Your “gusher” is capable of producing up to 20 barrels of oil per day. How much incentive will you have to restrict daily output in order to keep your price from falling? Why does the oil minister in Saudi Arabia think more about restricting production than you do? Explain.

You will have no incentive to restrict production to keep the price of oil high. You will be a price taker. But the world price of oil depends to a significant extent on the decisions made in Saudi Arabia about how much oil to sell each day. So Saudi Arabia is a price searcher.