A. Circle the best answer. Put a square around your second choice, if you want. If your second choice is correct you get half credit. 

(4 points each)

1. In the short run, expected gross revenue from an enterprise must exceed ________ in order to justify producing that enterprise.
   a. total costs
   b. variable costs
   c. fixed costs
   d. sunk costs

2. Capital assets include all of the following except:
   a. a tractor
   b. dairy cows
   c. a grain bin
   d. seed corn

3. An annual whole farm budget is developed from values taken from a set of:
   a. partial budgets
   b. cash flow budgets
   c. monthly budgets
   d. enterprise budgets

4. In an enterprise budget the difference between gross revenue and total costs is called:
   a. profit
   b. gross margin
   c. breakeven selling price
   d. net farm income

5. Linear programming is a mathematical technique that can be used to:
   a. find a set of enterprises that will maximize net farm income
   b. find the size of operating loan needed for each period during the year
   c. schedule all the machinery operations needed to plant and harvest a crop
   d. determine the breakeven selling price for a product

6. Which of the following concepts appears in a cash flow budget but not in a whole farm budget?
   a. cash rent on farmland
   b. depreciation on machinery
   c. principal payments for a 20-year loan to buy land
   d. wages paid to farm employees

7. The goal for a cash flow budget is to develop a plan for which:
   a. the ending cash balance for each period during the year is positive
   b. net farm income is maximized
   c. all available labor is utilized
   d. added revenue plus reduced costs exceeds reduced revenue plus added costs
8. Give an example of each of the following types of costs: 
   a. Opportunity cost
   b. Variable cost
   c. Ownership cost
   d. Cash cost
   e. Sunk cost

   a. Calculate the depreciation for the coming year on a newly purchased $30,000 sprayer assuming a 10% annual decrease in value.
      $____________
   b. Calculate the expected average annual depreciation on the same sprayer if it will be owned for 10 years and the salvage value after 10 years is expected to be $12,000.
      $____________
   c. Calculate the annual interest cost on the average value of the sprayer over the 10 years, if the farm’s cost of capital is 6.0% annually.
      $____________
10. Calculate the value per unit indicated for each of the following items that might appear in an enterprise budget. **Show your calculations.**

a. **Gross Revenue** per litter for farrow-to-finish hogs with a 9.0 pigs-per-litter weaning average. Pigs will be sold at 265 pounds at a price of $.50 per pound. Assume that there is a 5% death loss after weaning. All replacement gilts are purchased.

In addition, sows are sold after 4 litters at a weight of 400 pounds for $.36 per pound.

\[
\text{\$ } \quad \text{ per litter} \quad (5 \text{ points})
\]

b. The **cost of Roundup herbicide** for soybeans when 1.5 pints of it is applied per acre and it sells for $24 per gallon.

\[
\text{\$ } \quad \text{ per acre} \quad (3 \text{ points})
\]

c. **Interest cost** for dollars invested in a yearling steer purchased at a weight of 6.75 cwt. for a price of $85 per cwt. Money is borrowed at 8% annual interest rate, and the feeding period is 160 days.

\[
\text{\$ } \quad \text{ per head} \quad (3 \text{ points})
\]

d. The **breakeven selling price for oats** when total costs of production are $300 per acre, the expected yield of oats is 80 bushels per acre, and the expected straw production is 1.25 ton per acre worth $80 per ton.

\[
\text{\$ } \quad \text{ per bushel} \quad (3 \text{ points})
\]

e. The **annual charge for having your alfalfa hay baled** by a custom operator at $.45 per 70-pound bale, if the annual production is 5 tons of hay per acre.

\[
\text{\$ } \quad \text{ per acre} \quad (3 \text{ points})
\]
11. It is mid-August and the dairy farm next to yours offers to buy 40 acres of your corn. They will harvest it themselves for corn silage, and pay you $400 per acre.

Below is an enterprise budget that represents your expected costs and returns from growing corn and harvesting it as grain. In addition, if the neighbor harvests your corn as silage you will have to spend an extra $25 per acre for fertilizer next year on these acres.

<table>
<thead>
<tr>
<th>Revenue:</th>
<th>Variable Costs</th>
<th>Fixed Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>150 bu. @ $3.00</td>
<td>$450</td>
<td>$20</td>
</tr>
<tr>
<td>USDA fixed payments</td>
<td>$470</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$216</strong></td>
<td><strong>$188</strong></td>
</tr>
<tr>
<td><strong>Profit</strong></td>
<td></td>
<td><strong>$66</strong></td>
</tr>
</tbody>
</table>

Use the partial budget format below to determine how selling the corn to the neighbor instead of harvesting it as grain would affect profit, and by how much. (13 points)

**Change:** ________________________________  **Budget Unit:** _______________________

**Added Income**  
**Reduced Income**

**Reduced Costs**  
**Added Costs**

**Net change:** $ __________

How much would the neighbor have to pay you per acre for your corn for you to just break even, that is, earn the same profit as you would by harvesting it yourself?  

$ ________/ acre
12. a. Give an example of an important trend in agriculture that has occurred in the past decade. (3 points)

b. Give an example of how a farming operation could have responded to this trend. (3 points)

13. Assume that your enterprise budgets show the following expected values:

a. Fill in the blanks with the missing values. (6 points)

<table>
<thead>
<tr>
<th></th>
<th>Corn Following Corn</th>
<th>Corn Following Soybeans</th>
<th>Soybeans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross revenue per acre</td>
<td>160 bu. @ $3.25</td>
<td>172 bu. @ $3.25</td>
<td>53 bu. @ $7.00</td>
</tr>
<tr>
<td>Variable costs per acre</td>
<td>$300</td>
<td>$280</td>
<td>$131</td>
</tr>
<tr>
<td>Fixed costs per acre</td>
<td>$200</td>
<td>$200</td>
<td>$200</td>
</tr>
<tr>
<td>Gross margin per acre</td>
<td>_______</td>
<td>_______</td>
<td>_______</td>
</tr>
<tr>
<td>Profit per acre</td>
<td>_______</td>
<td>_______</td>
<td>_______</td>
</tr>
</tbody>
</table>

b. Find the breakeven selling price for corn that would make corn following corn equally profitable with a crop rotation of 50% corn following soybeans and 50% soybeans. Assume the selling price of soybeans stays at $7.00. (5 points)

$_____/bushel

14. Bonus question: What was the final score of last Saturday’s football game? (2 points)

Iowa State           _________
University of Iowa   _________
Econ 330  
Fall 2007  
Exam #1  

KEY

1. b  
2. d  
3. d  
4. a  
5. a  
6. c  
7. a  

8. a. operator labor charge, interest charge on equity capital  
   b. feed, fertilizer, fuel, seed, etc.  
   c. depreciation, interest, taxes and insurance  
   d. cash rent, seed, fuel, wages  
   e. seed cost after the crop is planted

9. a. $30,000 x 10% = **$3,000**  
   b. ($30,000 – 12,000)/10 years = **$1,800**  
   c. average value = ($30,000 + 12,000)/2 = $21,000  
      $21,000 x 6% = **$1,260**

10. a. 9.0 pigs/litter x .95 x 265 lb./pig x $.50/lb = $1,133  
          .25 sows/litter x 400 lb/sow x $.36/lb = $36  
          $1,133 + $36 = **$1,169/litter**  
   b. 1.5 pt./a. x 1 gal/8 pt. x $24/gal = **$4.50/acre**  
   c. 6.75 cwt./hd. x $85/cwt. x 8% x 160/365 yr. = **$20.12/head**  
   d. ($300 – 1.25 t/a x 80/t) / 80 bu/a = **$2.50/bushel**  
   e. $.45/bale x 1/70 bale/ton x 2,000 lb/ton x 5 ton/acre = **$64.28/acre**

11. **Change:**  
    
    **Budget Unit:**  
    1 acre

    **Added Income**  
    Sell corn for silage
    Sell standing corn $400
    Reduced Income  
    Selling corn $450

    **Reduced Costs**  
    Harvesting variable costs $40  
    Harvesting labor $15
    **Added Costs**  
    Extra fertilizer $25

    Net change: $400 + $55 - $450 - $25 = **$–20**
    $400 + $20 = **$420/acre**

12. a. growth of ethanol production  
    b. switch to more acres of corn
13. 

a. 

<table>
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</tr>
<tr>
<td></td>
<td>= 520</td>
<td>= 559</td>
<td>= 371</td>
</tr>
<tr>
<td>Variable costs per acre</td>
<td>$300</td>
<td>$280</td>
<td>$131</td>
</tr>
<tr>
<td>Fixed costs per acre</td>
<td>$200</td>
<td>$200</td>
<td>$200</td>
</tr>
<tr>
<td>Gross margin per acre</td>
<td>220</td>
<td>279</td>
<td>240</td>
</tr>
<tr>
<td>Profit per acre</td>
<td>20</td>
<td>79</td>
<td>40</td>
</tr>
</tbody>
</table>

b. \( (P_c = \text{price of corn}) \)

\[
160 P_c - 500 = (172 P_c - 480 + 40) / 2 \\
160 P_c - 500 = 86 P_c - 240 + 20 \\
160 P_c - 86 P_c = 500 - 240 + 20 \\
74 P_c = 280 \quad P_c = \frac{280}{74} = \$3.78/\text{bushel} \\
\]

14. 15, 13