

# AGRIBUSINESS MANAGEMENT CONTEST

2008 Career Development Events

## Problems Section

For the following problems, place your answer for each question in the corresponding numbered space on the answer card. Computations may be done in the margins or on the back of this paper, but not on the card. Each question is worth five (5) points. There is only one correct answer for each question.

### PROBLEM I. Balance Sheet and Analysis

Use the following beginning and ending Balance Sheet for Mrs. Nettie Worth when answering questions 1 through 12.

Balance Sheet for Mrs. Nettie Worth, Rainy Day Ranch, Williamston, S.C.

12/31/98		12/31/99
<b>Assets</b>		
<b>Current Assets</b>		
Cash/Checking	\$ 18,313	\$ 15,425
Inventories		
Crops and Feed	\$ 27,645	\$ 37,275
Market Livestock	\$ 12,924	\$ 14,246
Supplies	\$ 4,096	\$ 5,096
Prepaid Expenses	\$ 5,278	\$ 4,797
<b>Total Current Assets</b>	<b>\$ 68,256</b>	<b>\$ 76,839</b>
<b>Non-Current Assets</b>		
Breeding Livestock	\$ 65,598	\$ 60,720
Machinery and Equipment	\$143,219	\$153,192
Buildings and Improvements	\$ 47,265	\$ 46,000
Land	\$292,000	\$292,000
<b>Total Non-Current Assets</b>	<b>\$548,082</b>	<b>\$551,912</b>
<b>Total Farm Assets</b>	<b>\$616,338</b>	<b>\$628,751</b>
<b>Liabilities</b>		
<b>Current Liabilities</b>		
Current Portion of Term Debt	\$ 36,854	\$ 37,540
Accounts Payable	\$ 1,032	\$ 943
Accrued Interest	\$ 1,205	\$ 1,000
Operating Loans Payable	\$ 21,740	\$ 26,582
Current Portion - Deferred Taxes	\$ 3,527	\$ 2,670
<b>Total Current Liabilities</b>	<b>\$ 64,358</b>	<b>\$ 68,735</b>
<b>Non-Current Liabilities</b>		
Breeding Livestock	\$ 22,892	\$ 20,726
Machinery	\$ 42,820	\$ 58,760
Farm Mortgage	\$139,358	\$137,419
Non-Current Portion-Deferred Taxes	\$ 81,867	\$ 86,431
<b>Total Non-Current Liabilities</b>	<b>\$286,937</b>	<b>\$303,336</b>
<b>Total Farm Liabilities</b>	<b>\$351,295</b>	<b>\$372,071</b>
<b>Net Worth or Equity</b>	<b>\$265,043</b>	<b>\$256,680</b>
<b>Total Liabilities and Net Worth</b>	<b>\$616,338</b>	<b>\$628,751</b>

Questions 1 through 12 refer to Mrs. Worth's Balance Sheet shown on the previous page. Round ratios to two decimals.

1. What was Mrs. Worth's Current Ratio on December 31, 1998?

- A. 1.01:1
- B. 1.06:1
- C. 1.11:1
- D. 1.19:1
- E. 1.30:1

2. What was Mrs. Worth's Current Ratio on December 31, 1999?

- A. 1.01:1
- B. 1.06:1
- C. 1.12:1
- D. 1.19:1
- E. 1.30:1

3. How much working capital did Mrs. Worth have on December 31, 1999?

- A. \$(-3,898)
- B. \$ 8,104
- C. \$ 9,001
- D. \$ 76,839
- E. None of the above

4. Which measure of liquidity shows the size or magnitude of the amount of liquidity?

- A. Current ratio
- B. Net worth
- C. Working capital
- D. Both B and C
- E. None of the above

5. Consider the change in liquidity on Mrs. Worth's ranch between December 31, 1998 and December 31, 1999. Based on her balance sheet information, was her farm business:

- A. More liquid on December 31, 1998
- B. More liquid on December 31, 1999
- C. Less liquid on December 31, 1998
- D. Both B and C
- E. None of the above

6. What was Mrs. Worth's Debt-to-Asset Ratio on December 31, 1999?
- A. 18.47%
  - B. 57.00%
  - C. 59.18%
  - D. 66.76%
  - E. 95.04%
7. Based on the December 31, 1999 balance sheet for Mrs. Worth, what percent of all debts (liabilities) due as of 12/31/99 were scheduled to be paid during the year 2000?
- A. 18.47%
  - B. 57.00%
  - C. 59.18%
  - D. 66.76%
  - E. 95.04%
8. What percent of Mrs. Worth's assets were financed by debt on December 31, 1998?
- A. 18.47%
  - B. 57.00%
  - C. 59.18%
  - D. 66.76%
  - E. 95.04%
9. Consider the change in solvency on Mrs. Worth's ranch between December 31, 1998 and December 31, 1999. Based on her balance sheet information, was her farm business:
- A. More solvent on December 31, 1998
  - B. More solvent on December 31, 1999
  - C. Less solvent on December 31, 1999
  - D. Both A and C
  - E. None of the above
10. What was Mrs. Worth's Equity-to-Asset Ratio on December 31, 1998?
- A. 31.50%
  - B. 40.02%
  - C. 43.00%
  - D. 76.35%
  - E. 95.04%

11. What percent of Mrs. Worth's assets were financed by equity on December 31, 1998?
- A. 31.50%
  - B. 40.02%
  - C. 43.00%
  - D. 76.35%
  - E. 35.50%
12. Assume the liability values are accurate and the asset values shown on the balance sheet accurately represent the values of the assets if the assets had been sold on the dates specified. If on December 31, 1998, Mrs. Worth had sold all of her assets and paid off all of her debts, how much money would she have had left?
- A. \$616,338
  - B. \$548,082
  - C. \$265,043
  - D. \$ 68,258
  - E. None of the above

## Problem II - Income Statement and Analysis

Mrs. Worth withdrew \$28,000 last year for family living expenses. Use this \$28,000 as the value of Mrs. Worth's unpaid family and operator labor and management. Mrs. Worth feels that she could earn a 7 percent return on her money in off-farm investments. Use this figure in calculating the opportunity cost of Mrs. Worth's assets or equity. Use this information, the balance sheet on page 2, and the following Income Statement for Mrs. Worth to answer questions 13 through 19.

### 1999 Income Statement for Mrs. Nettie Worth, Rainy Day Ranch, Williamston

#### South Carolina

<u>Revenues</u>		<u>Expenses</u>	
Sorghum	\$29,742	Purchased Feed	\$ 4,201
Calves	\$37,943	Seed	\$ 1,500
Hay	\$ 5,246	Fertilizer	\$ 3,748
<b>Inventory Changes</b>		Livestock Expenses	\$ 4,546
Crops	\$ 545	Gasoline, Fuel, and Oil	\$ 2,975
Livestock	\$ 2,506	Hired Labor	\$ 4,786
Accounts Receivable	\$ (-600)	Repairs	\$ 2,999
Cull Cows	\$ 3,012	<b>Inventory Adjustments</b>	
Other	<u>\$ 642</u>	Prepaid Expenses	\$ 500
<b>Total Gross Revenue</b>	<b>\$79,036</b>	Account Payable	\$ 850
		Depreciation	\$ 3,856
		Interest	\$ 5,856
		Other	\$ 150
		<b>Total Expenses</b>	<b>\$35,310</b>
		<b>Net Farm Income from Operations</b>	<b>\$43,726</b>
		Gain/Loss on Sale of Capital Assets	<u>\$ 7,199</u>
		<b>Net Farm Income</b>	<b>\$50,925</b>

13. What is Mrs. Worth's 1999 net farm income (return to unpaid family and operator labor, equity capital, and management)?

- A. \$50,925
- B. \$43,726
- C. \$26,726
- D. \$79,036
- E. None of the above

14. What is Mrs. Worth's 1999 adjusted net farm income (return to unpaid family and operator labor, total capital, and management)?

- A. \$62,036
- B. \$58,124
- C. \$56,124
- D. \$26,726
- E. None of the above

**Two measures of profitability are the rate of return on farm assets (ROA) and the rate of return on equity (ROE). Definitions for ROA and ROE are:**

**ROA = (Net farm income from operations plus farm interest expense minus the value of unpaid family and operator labor and management) divided by average total farm assets. Multiply by 100 to express as a percentage.**

**ROE = (Net farm income from operations minus value of unpaid family and operator labor and management) divided by average farm equity. Multiple by 100 to express as a percentage.**

15. If the value of Mrs. Worth's unpaid family and operator labor and management is \$28,000, what is Mrs. Worth's ROA? ROUND PERCENTAGE TO TWO DECIMALS.

- A. 1.95%
- B. 2.78%
- C. 3.36%
- D. 5.72%
- E. 6.03%

16. If the value of Mrs. Worth's unpaid family and operator labor and management is \$28,000, what is Mrs. Worth's ROE? ROUND PERCENTAGE TO TWO DECIMALS.

- A. 1.95%
- B. 2.78%
- C. 3.36%
- D. 5.72%
- E. 6.03%

17. Mrs. Worth has been considering refinancing her loans to obtain a lower interest rate. Assume the amount of money borrowed and other revenues and expenses will be the same whether she refinances or not. Indicate if you would expect refinancing her loans to obtain a lower interest rate to increase or decrease ROE or if the impact is uncertain from the information provided.

- A. Increase
- B. Decrease
- C. Uncertain
- D. All of the above
- E. None of the above

**Mrs. Worth is concerned about her operating profit margin. The Operating Profit and Operating Profit Margin Ratio are defined as:**

**Operating Profit = Net farm income from operations, plus interest expense, minus the opportunity cost of unpaid family and operator labor and management.**

**Operating Profit Margin Ratio = Operating Profit divided by total gross revenues.  
(Multiply by 100 to express as a percentage.)**

18. What is the Operating Profit for Mrs. Worth's ranch?

- A. \$ 6,925
- B. \$10,925
- C. \$26,726
- D. \$20,925
- E. None of the above

19. What is the Operating Profit Margin Ratio for Mrs. Worth's ranch? ROUND PERCENTAGE TO TWO DECIMALS.

- A. 9.16%
- B. 26.47%
- C. 27.28%
- D. 31.52%
- E. 40.53%



**Use this projected cash flow to answer questions through 25.**

**Receipts**

	Units	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
	100	0	0	0	0	0	0	7650	13600	11900	5100	4250	0	0
	230	0	0	0	0	0	0	0	0	0	0	55338	0	0
	215	0	0	0	0	0	0	0	0	0	0	123259	0	0
	115	0	0	0	0	0	0	0	0	0	0	0	0	56304
	24	0	0	0	0	0	0	0	0	0	18533	0	0	0
	101	0	0	0	0	0	0	0	0	0	0	0	39996	0
	25	0	0	0	0	0	0	0	0	0	0	7500	0	0
	10	0	0	0	0	0	0	0	0	0	0	0	0	2625
	242	46173	42838	48871	48659	49660	45840	45536	43263	42444	43990	42747	45699	45699
	175	0	0	0	0	0	0	0	0	0	0	0	37188	0
	266	0	0	0	0	0	0	0	0	0	0	85586	0	0
	25	0	0	0	0	0	0	0	0	0	0	7081	0	0
20)	2200	18181	18181	18181	18181	18181	18181	18181	18181	18181	18181	18181	18181	18181
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		7088	6379	6524	5804	6310	6309	5175	6379	6524	6769	7691	7911	7911
available rent					2000					1500				
<b>Receipts</b>		71442	67398	75576	72644	81801	83930	80792	91456	258996	201603	108432	128099	128099
<b>Expenses</b>														
ship. restock														
<b>Total Sales</b>		0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Non-Farm Income</b>														
aries		0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Income</b>		71442	67398	75576	72644	81801	83930	80792	91456	258996	201603	108432	128099	128099

Operating Expense	Aug	Sep	Oct	Nov	Dec
0000Seed	0	0	0	0	0
002021500Fertilizer	0	0	0	0	0
50000Chemicals	11050	0	0	0	0
om work	0	0	0	0	0
2432432432Utilities	432	432	432	432	648
73352337230313213Trucking/Marketing	3054	4157	3176	3684	3190
Storage	0	0	0	0	0
12620248425832745Livestock Medicine	2378	2441	2740	3694	3691
353339326397783764350659Feed Purchased	45370	40275	38843	40726	37801
03422576830423422Other Costs	4751	3220	17820	3261	3392
07152804056014807Fuel, Lube, Repairs	7965	12973	4121	9149	4756
Cash Rent	0	0	0	0	11200
1759318975192098112Labor Hired	9281	12220	7049	9984	8243
ellaneous Cost	0	0	0	0	0
rop Insurance	0	0	0	0	0
axes (Re & Pers Pro)	0	0	0	0	7800
r Farm Oper Exp	0	28000	0	0	0
arm Insurance	0	0	0	0	0
Lvstk Pur for Resale	0	0	0	17190	0
03250325032503250Overhead Expenses	3250	3250	3250	3250	3250
<b>34747806521033336479178640Total Op. Expenses</b>	<b>87531</b>	<b>106968</b>	<b>77431</b>	<b>91370</b>	<b>83971</b>

**Capital Purchases & Other Expense**

Stock	38670											
s, Tile	3000	25000										
<b>Expenses</b>	3000	0	0	0	0	0	0	0	38670	25000	0	0
etc.	400028002800380029003800290035002800370027002800 18000											
<b>Term Debt</b>	1640013850121501640013850 8907701545890770											
<b>Expenses</b>	2800	2700	21700	17420	3500	20190	3800	16595	3800	17420	2800	21290
<b>Expenses</b>	84440	67491	125033	98072	138247	118425	90456	104126	149438	119851	94170	105261

<b>Projected Cash</b>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ce	-	-93	-49457	-25428	-56446	-34495	-9664	-12670	109558	81752	14262	22832
12998												
Balance	4500	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
	-8498	1907	-47457	-23428	-54446	-32495	-7664	-10670	111558	83752	16262	24832
Period	10497	2000	49457	25428	56447	34495	9664	12671	0	0	0	0
<b>Financial Information</b>												
ments	0	1908	0	0	0	0	0	0	13626	1274	687	588
est	5010	3690	4291	5253	6401	7960	9771	11652	0	0	0	0
ments	0	0	0	0	0	0	0	0	95934	80479	13575	22241
Op. Debt	80497	82497	131953	157382	213829	248324	257988	270659	174724	94246	80671	58430
Balance	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000

Bank Account Balance	4500	Ending Bank Account Balance	2000	Total Inflows	1
Monthly Bank Balance	2000	Ending Accrued Interest Due	0	Total Outflows	1
Operating Loan	70000	Ending Operating Loan Amount	58430		
Accrued Interest Due	4500				
	8.75%	Hired Labor Rate	6.00		

### PROBLEM III - Projected Cash Flow

Use the projected Cash Flow for 2000 shown above for Mrs. Worth to answer questions 20 through 25.

20. What are Mrs. Worth's projected Total Operating Expenses for 2000?

- A. \$1,322,163
- B. \$1,094,325
- C. \$1,295,010
- D. \$1,527,322
- E. None of the above.

21. What are Mrs. Worth's projected Total Operating Receipts for 2000?

- A. \$1,322,163
- B. \$1,094,325
- C. \$1,295,010
- D. \$1,527,322
- E. None of the above.

22. What are Mrs. Worth's projected Total Outflows?

- A. \$1,322,163
- B. \$1,094,325
- C. \$1,295,010
- D. \$1,527,322
- E. None of the above.

23. In what month will Mrs. Worth have the largest Total Operating Expenses?

- A. April
- B. May
- C. August
- D. September
- E. None of the above

24. In what month will Mrs. Worth have the largest Total Cash Expenses?

- A. April
- B. May
- C. August
- D. September
- E. None of the above

25. In what month will Mrs. Worth have the largest Accumulated Operating Debt?

- A. April
- B. May
- C. August
- D. September
- E. None of the above.

### Problem IV – MARKETING

For questions 26 through 35, refer to the following information. The following futures and marketing information for corn is typical for the farming area. The farmer is considering four marketing alternatives

(1) cash corn sale at harvest; (2) hedge the corn with futures contracts; (3) purchase a put option for the corn; and (4) write/sell a call option for the corn. Because on-farm storage space is not available for the potential corn production, the farmer will have to deliver the crop at harvest. Answer the following questions about the farmer's marketing alternatives. Note: Round answers to two decimal places and assume no commissions, zero interest cost on margins and premiums, and zero time value for options on November 15.

Date	Futures Price Per Bushel Dec. Corn	Dec. Put Strike Per Bushel	Dec. Put Premium Per Bushel	Dec. Call Strike Per Bushel	Dec. Call Premium Per Bushel	Forward Cash Contract Price Per Bushel
March 15	\$2.60	\$2.60	\$0.22	\$2.90	\$0.10	\$2.10
June 15	\$2.40	\$2.40	\$0.18	\$2.70	\$0.08	\$2.10
July 15	\$2.70	\$2.70	\$0.25	\$3.00	\$0.12	\$2.20
August 15	\$2.25	\$2.20	\$0.15	\$2.50	\$0.05	\$2.10
(Harvest Month) November 15	\$2.25					\$1.80 Harvest Cash Price

The farmer has used hedging strategies before and realizes that the net price can vary based on when the hedge is placed and lifted. Answer the following questions based on the projected prices shown above.

26. What would be the expected corn price (per bushel) if the farmer waited until harvest and sold at the local cash price?

- A. \$2.25
- B. \$2.10
- C. \$1.80
- D. Need more information
- E. None of the above

27. If the farmer hedged by selling December corn on March 15 and lifting the hedge on November 15, what would be the expected net corn price (per bushel) utilizing both cash and futures markets?
- A. \$1.80
  - B. \$2.60
  - C. \$2.15
  - D. \$2.25
  - E. None of the above
28. If the farmer hedged by selling December corn on July 15 and lifting the hedge on November 15, what would be the expected net corn price (per bushel) utilizing both cash and futures markets?
- A. \$2.25
  - B. \$2.15
  - C. \$2.70
  - D. \$1.80
  - E. None of the above
29. Which marketing strategy provided the farmer with the best net price per bushel for her corn?
- A. Cash sale at harvest
  - B. July to August hedge and roll to a forward contract on August 15
  - C. March to November hedge
  - D. July to November hedge
  - E. Forward Cash contract on July 15
30. What market conditions would lead to your selection in question 29, above?
- A. Corn price falling and basis widening
  - B. Corn price falling and basis narrowing
  - C. Corn price falling and basis constant
  - D. Corn price increasing
  - E. None of the above

31. On November 15, what will be the value of these component parts of a December put option?
- A. Time value of the December option will be approaching zero value
  - B. Time value will be approaching the premium value, if December futures are trading below the strike price
  - C. The intrinsic value always equals zero
  - D. A and B are correct
  - E. All of the above are correct
32. If the farmer purchased the December put option on July 15 and liquidated the option position on November 15, what is the expected net price for corn?
- A. \$2.25
  - B. \$2.00
  - C. \$2.15
  - D. \$1.80
  - E. None of the above
33. Why would the farmer consider buying a put option as a strategy rather than a conventional hedge as analyzed earlier?
- A. The put option strategy results in a higher expected net price
  - B. The put option strategy will have less basis risk
  - C. The put option strategy makes it easier to take advantage of rising corn prices
  - D. Put strategy requires margin calls.
  - E. None of the above
34. The broker tells the farmer one may also consider writing/selling a call option as a strategy for increasing the expected corn price. Assume the farmer purchases the December \$2.70 put on July 15, writes/sells the December \$3.00 call option on July 15, and liquidates the position on November 15. What is the expected net price for her corn?
- A. \$2.25
  - B. \$2.10
  - C. \$2.15
  - D. \$1.80
  - E. None of the above



35. Which of the following results are correct for this buy a put and sell a call option strategy?

- A. Reduces the risk associated with falling marketing prices
- B. The call option generates additional revenue
- C. Limits the maximum price received
- D. Strategy is subject to margin calls
- E. All of the above

36. The loan deficiency payment (LDP) is a USDA payment that equals the positive difference between the county loan and the posted county price (PCP) on the date the payment is claimed. Some policy makers want to increase the loan rate as part of the “farm safety net”. The LDP has often been described as a “free” put, because the grower pays no premiums. Assume a grower buys puts to cover the expected yield with a strike, adjusted for basis, that equals the loan rate, and the market falls. Under the following conditions, which alternative would pay more before premiums are deducted.

- A. If crop yields are high, the LDP would pay more than the gross payment for the put (before put premiums are deducted)
- B. If crop yields are zero, the LDP would pay nothing
- C. If crop yields are zero, the put would pay the intrinsic value plus any time value, less premiums
- D. A and C are correct
- E. All of the above are correct

### **Problem V - Investment Analysis**

You are considering buying a combine which costs \$140,000. The bank will finance the remaining loan after a 30% down payment. The loan is at 10% (APR) for five years with yearly payments of \$25,852.

37. What is the beginning principal of the loan?
- A. \$140,000
  - B. \$112,000
  - C. \$ 42,000
  - D. \$ 98,000
  - E. None of the above.
38. What is the cash requirement for the loan during the first year (including the down payment)?
- A. \$25,852
  - B. \$42,000
  - C. \$67,852
  - D. \$98,000
  - E. None of the above
39. For the second year
- A. The yearly payment decreases
  - B. The yearly payment increases
  - C. The principal portion of the yearly payment decreases
  - D. The interest portion of the yearly payment decreases
  - E. None of the above
40. How much interest is paid over the life of the loan?
- A. \$ 9,800
  - B. \$25,852
  - C. \$31,260
  - D. \$35,652
  - E. None of the above.