

Over All Exam Scores:

High	100	Average	74.38	14.3	Std.Dev.
	97				
	93.5	Median	76.25		
	92.5				
	86.5	4 > 90%			A
	81	7 between 79 - 87%			B
	80	7 between 68 - 77%			C
	80	3 between 59 - 62%			D
	80	3 below 59%			F
	79.5				
	79.5	24			
	76.5				
Median	76				
	74				
	70.5				
	69				
	69				
	68				
	61.5				
	61				
	59				
	56.5				
	48.5				
	46				

Title : Heat Exchanger Cost Estimate

Given : see table in computations section

Approach :

- (a) Determine size scaling exponent from the two data points
- (b) Size scale 500 ft² unit to new size 950 ft²
- (c) Use M&S index to forecast future price 3 quarters into future
21 points per quarter 2
2 quarters forecast

Computations :

Reactor	Size	material	date	1st Qtr. 2008 = Cost	M&S	4th Qtr. 2007 =
A	500	SST	2007	\$ 9,460	1383.6	1425.6
B	2000	SST	2007	\$ 20,000	1383.6	

- (a) price of size 2000 = price of size 500 * (2000/500)ⁿ
 (rearrange) 2ⁿ = price of size 2000 / price of size 500
 (take log's to solve for n) n = ln(price of size 2000/price of size 500) / ln(2000/500)
 size exponent n = 0.5400 = ln(\$20,000 / \$9,450) / ln(4)

- (b) Estimated cost for 950 ft² unit
 current cost of newT \$ 13,379 = \$9,460 * (950/500)^{0.54} \$13,400 2 quarters forecast
- (c) Forecast price for January 2008 = \$13,379 * (1435.6/1383.6) \$ 13,785

Total Cost \$ 13,988 round off answer = \$ 14,000 \$ 13,800

Prob. #1	correct answers:	correct method:	answer	Median	Average	Std. Dev.
	14 to 19	20	\$13,776	20.0	18.7	2.5
	8 @ 3 Qtr's	14 @ 2 Qtr's			Possible =	20

Title : Product Manufacturing Cost as function of production rate

Given :

Variable Costs	68%		
Total Annual Product Cost		\$2,400,000	
Annual production		1,000,000	Cases
	TPC	\$ 2.40	per case
desired Annual production		1,250,000	Cases

Approach :

Calculate variable costs dependent on per case produced
 Calculate fixed costs independent of production rate

Computations :

a) current production costs	\$1,632,000	per year variable costs	
	= per Nozzle Variable Costs * Nozzles made per year		
	\$768,000	per year fixed costs	\$0.77
	\$1.63	per case variable costs	
b) increased production costs	\$2,040,000	per year variable costs	
Fixed Costs per case =	\$0.61	= Fixed Costs / Nozzles made per year	
Total Annual Fixed + Variable Costs =	\$2,808,000	per year	\$2.2464
Total	\$2.25	per case	ANSWER

correct answers: correct method:

16

Median Average Std. Dev.

20.0 17.2 4.9

Possible = 20

Title : Onion Ring Fryer Oil Recovery

Given :	daily production	days/year	Value	Oil savings
	1,100	275	\$2.97	\$898,425
	gallons / day	days / year	\$'s / gallon	= \$'s / year

Approach : Use Turn Over Ratio

(a) Turn Over Ratio = Annual Sales / Fixed Investment

(b) Assume typical industry turn over ratio ~ 1.0 **1.0**

Computations :

Fixed Capital Investment = Annual Oil Savings / 1.0

round off answer = \$ 900,000 \$ 898,425

21
correct answers:
11

Student assumed Turn Over Ratio's

	2.00	\$	449,213	
Average Turn Over Ratio				
0.8	1.00	\$	898,425	5
	0.80	\$	1,123,031	1
Average FCI	0.50	\$	1,796,850	4
\$7,961,411				

correct answers: correct method:
7 to 10 3

Median Average Std. Dev.
19.5 15.2 7.2
Possible = 20

Title : Antifreeze Company Income Statement

Given :

data in problem statement, reproduced in Income Statement below

Approach : organized by income, deductions, surplus

Computations :

Income			
Sales		\$15,100	
Total Income			\$15,100
Deductions			= beginning value + made - ending value
Cost of Goods Sold	\$8,600		= 1,300 + 18,900 - 1,600
Beginning Inventory, Sept. 30	\$1,300		
Manufactured during October	\$18,900		
Ending Inventory, Oct. 31	\$11,600		
Salaries	\$3,000		
Delivery Expenses	\$700		
Rent	\$400		
Other expenses	\$1,200		
Total Deductions		\$13,900	neglecting inventory \$5,300
Profit before provision for income taxes		\$1,200	\$9,800
earned surplus on Sept. 30	\$800		\$10,600
Total Surplus on October 31		\$2,000	= beginning surplus + Oct. profit retained

correct answers:

2

6

\$19,200	\$20,600	High			
\$7,105	\$6,518	Average	Median	Average	Std. Dev.
(\$3,800)	\$800	Low	6.0	8.1	5.9
answer a)	answer b)		Possible =	20	

