Module/Week 3 Homework: Introduction to Optimization Modeling MGMT 5260: Decision-Making Techniques for Managers

Please create a single Excel file with each problem on a separate worksheet tab.

Problem 1

Problem 4.45(a) – Bus Company (p. 200) - No template is provided

Problem 2

Problem 4.78(a) – Oil	Company	(p. 204)		
Selling price per barrel				
Input	C os t	Density	Viscosit y	Sulfur
Light gas oil	\$69.50	0.83	40	1.0
Heavy gas oil	\$66.70	0.88	26	2.2
Waxy distillate	\$56.40	0.92	30	2.8
Atmospheric residue	\$16.50	0.97	65	4.1
Vacuum residue	\$10.40	1.50	48	5.0
Upper limits				
Blending plan (1000s of	barrels)			
Input	Input used		Availabl e	
Light gas oil		<=	40	
Heavy gas oil		<=	50	
Waxy distillate		<=	70	
Atmospheric residue		<= 60		
Vacuum residue		<=	80	
Constraints Actual	Density	Viscosity	Viscosity Sulfur	
	<=	<=	<=	
Maximum				
Profit				

Problem 3

- 1. Create the spreadsheet model only with the linear demand function
- 2. Use DataTable to calculate profits for specified prices and highlight the best profit
- 3. Generate a scatter diagram based on the table created in (b)

Problem 7.45(a) - Pricing a Mustang (p. 402)					
Current demand	250000				
Current price	\$20,000				
Unit cost	\$16,000				
Current elasticity	-1.5				
Part (a): linear demand					
a					
b					
New price					
New demand					
Profit					
Price	Profit				
\$21,000.00					
\$21,500.00					
\$22,000.00					
\$22,500.00					
\$23,000.00					
\$23,500.00					
\$24,000.00					
\$24,500.00					
\$25,000.00					
\$25,500.00					
\$26,000.00					
\$26,500.00					
\$27,000.00					
\$27,500.00					
\$28,000.00					
\$28,500.00					

OPTIONAL

- No template will be provided for this optional, extra credit problem. Please use the • problem description from page 208 of your textbook to create the spreadsheet model.
- If you provide a correct solution then you will be awarded 7 extra bonus points for ٠ this homework assignment.
- There will be no partial bonus points awarded for a partial solution. Your answer • must be fully correct to receive extra credit.

Problem 4.101	l - Ingot Prod	duction at Alu	ıminaca (p. 2	208)		
Production data (maximum produ	ction if furnaces	are devoted enti	rely to a par	rticular ing	got length)
Furnace	100-foot	200-foot	300-foot			
1	230	340	350			
2	230	260	280			
3	240	300	310			
4	200	280	300			
Cost per foot						
Decisions (how m	hany hours on ea	ch furnace to de	vote to each ingo	ot length)		
Furnace	100-foot	200-foot	300-foot	Sum		Available
1					<=	
2					<=	
3					<=	
4					<=	
Ingots produced						
Furnace	100-foot	200-foot	300-foot			
1						
2						
3						
4						
Total						
Demand constra	aints					
	100-foot	200-foot	300-foot			
Available						
	>=	>=	>=			
Demand	700	300	150			
Total cost						