Assignment 1

Make or Buy Decision

1. You are given the following information:

COSTS	MAKE OPTION	BUY OPTION
Fixed Cost	$125,000	$5,000
Variable Cost	$15	$17

   a. Find the break-even quantity and the total cost at the break-even point.
   b. If the requirement is 150,000 units, is it more cost-effective for the firm to buy or make the components? What is the cost savings for choosing the cheaper option?

2. Ms. Jane Kim, Purchasing Manager of Kuantan ATV, Inc., is negotiating a contract to buy 20,000 units of a common component part from a supplier. Ms. Kim has done a preliminary cost analysis on manufacturing the part in-house and concluded that she would need to invest $50,000 in capital equipment and incur a variable cost of $25 per unit to manufacture the part in-house. Assuming the total fixed cost to draft a contract with her supplier is $1,000, what is the maximum purchase price that she should negotiate with her supplier? What other factors should she negotiate with the suppliers?

3. A Las Vegas, Nevada, manufacturer has the option to make or buy one of its component parts. The annual requirement is 20,000 units. A supplier is able to supply the parts for $10 per piece. The firm estimates that it costs $600 to prepare the contract with the supplier. To make the parts in-house, the firm must invest $50,000 in capital equipment and estimates that the parts cost $8 per piece.

a. Assuming that cost is the only criterion, use break-even analysis to determine whether the firm should make or buy the item. What is the break-even quantity and what is the total cost at the break-even point?
b. Calculate the total costs for both options at 20,000 units. What is the cost savings for choosing the cheaper option?

Total Cost of Ownership

1. Given the following information, use total cost analysis to determine which supplier is more cost-effective. Late delivery of raw material results in 60 percent lost sales and 40 percent back orders of finished goods.

Order lot size	1,000
Requirements (annual forecast)	120,000 units
Weight per engine	22 pounds
Order processing cost	$125/order
Inventory carrying rate	20% per year
Cost of working capital	10% per year
Profit margin	15%
Price of finished goods	$4,500
Back order cost	$15 per unit

ORDER SIZE	SUPPLIER 1	SUPPLIER 2
1 to 999 units/order	$50.00 per unit	$49.50 per unit
1000 to 2,999 units/order	$49.00 per unit	$48.50 per unit
3,000 + units/order	$48.00 per unit	$48.00 per unit
Tooling cost	$12,000	$10,000
Terms	2/10, net 30	1/10, net 30
Distance	125 miles	100 miles
Supplier Quality Rating	2%	2%
Supplier Delivery Rating	1%	2%

Truckload (TL ≥ 40,000 lbs):	$0.85 per ton-mile
Less-than-truckload (LTL):	$1.10 per ton-mile

Note: per ton-mile = 2,000 lbs per mile

2. A buyer received bids and other relevant information from three suppliers for a vital component part for its latest product. Given the following information, use total cost analysis to determine which supplier should be chosen. Late delivery of the component results in 70 percent lost sales and 30 percent back orders of finished goods.

Order lot size	2,000
Requirements (annual forecast)	240,000 units
Weight per engine	40 pounds
Order processing cost	$200/order
Inventory carrying rate	20% per year
Cost of working capital	10% per year
Profit margin	15%
Price of finished goods	$10,500
Back order cost	$120 per unit

ORDER SIZE	SUPPLIER 1	SUPPLIER 2	SUPPLIER 3
1 to 999 units/order	$200.00 per unit	$205.00 per unit	$198.00 per unit
1,000 to 2,999 units/order	$195.00 per unit	$190.00 per unit	$192.00 per unit
3,000 + units/order	$190.00 per unit	$185.00 per unit	$190.00 per unit
Tooling Cost	$12,000	$10,000	$15,000
Terms	2/10, net 30	1/15, net 30	1/10, net 20
Distance	120 miles	100 miles	150 miles
Supplier Quality Rating	2%	1%	2%
Supplier Delivery Rating	1%	1%	2%

Truckload (TL $\geq$ 40,000 lbs): $0.95 per ton-mile

Less-than-truckload (LTL): $1.20 per ton-mile

Note: per ton-mile = 2,000 lbs per mile