MS-4703: RELEVANT COSTING

Source: Latest version of CPALE Syllabus for MANAGEMENT SERVICES

1.4	Management Accounting Concepts and Techniques for Decision Making	
1.4.1	Relevant costing and differential analysis	
	1.4.1.1	Definition and identification of relevant costs
	1.4.1.2	Concept of opportunity costs
	1.4.1.3	Approaches in analyzing alternatives in non-routine decisions (total and differential)
	1.4.1.4	Types of decisions (make or buy, accept, or reject special order, continue or drop/shutdown, sell or process further, best product combination, pricing decisions)
	1.4.1.5	Probability analysis (expected value concept)
	1.4.1.6	Decision tree diagram
	1.4.1.7	Linear programming (graphic method; algebraic method)

1. TOTAL ANALYSIS vs. DIFFERENTIAL ANALYSIS

K-Pop Company currently sells 10,000 units of its lone product at a price of P 50 per unit. The product costs at this level of activity are given below:

Variable Costs:		*Fixed Costs:*	
Direct materials	P 12	Fixed Overhead	P 80,000
Direct labor	10	Fixed Selling Expense	40,000
Variable Overhead	5		
Variable Selling Expense	3		

REQUIRED:

A) What is the present profit?
B) Supposed that the company could increase its sales by 25% if it spends P 30,000 for advertisements, what is will be the increase or decrease in profit using:
   1) Total approach 2) Differential approach

2. MAKE or BUY (Outsourcing Decision)

BMW Company must decide whether it must continue to produce an engine component or buy it from Sarao-Philippines for P 2,500 each. The demand for the coming year is 20 units. The costs of producing a single unit of the engine component are as follows:

Direct materials	P 1,200
Direct labor	800
Factory Overhead (70% fixed)	1,000
	P 3,000

If BMW buys the components, the facility currently used to make the components can be rented out for P 10,000.

REQUIRED:

A) Should BMW make or buy the components?
B) How much is the maximum amount that BMW is willing to pay an outside supplier for the engine component?

3. ACCEPT or REJECT (Special Order Decision)

Twice Company produces and sells toy cars. Each toy car sells for P 50 and the company sells approximately 500,000 toy cars each year. Unit cost data for 2022 are given below:

	Fixed	Variable
Direct Material	-	P 15
Direct Labor	-	P 12
Factory Overhead	P 8	P 5
Distribution Costs	P 2	P 3

Twice has received an offer from a foreign customer to purchase 15,000 toy cars at P 40. Domestic sales will not be affected by this transaction. If the offer is accepted, the company has idle capacity to accommodate the order but the unit variable distribution costs will increase by P 2 for insurance and import duties.

REQUIRED:

A) What is the relevant unit cost of the special order?
B) Should Twice accept or reject the special order?

4. SPECIAL ORDER PRICING

BTS Company sells Product "Jimin" at a unit price of P 36,000, with the following unit production costs:

Direct materials	P 12,000
Direct labor	8,000
Variable overhead	6,000
Fixed overhead	4,000

A special order for 1,000 units was received from Jungkook, a well-known Product Jimin distributor based in K-Town. Additional shipping costs for this sale are P 4,000 per unit.

REQUIRED:

What is the minimum selling price per unit for the special order if:

A) BTS is operating at FULL capacity?
B) BTS has EXCESS capacity?

5. CONTINUE or SHUTDOWN (Shutting Down Operations)

The combined income statement of Itzy Stores for Baguio and Cebu branches is given below:

	Baguio Branch	Cebu Branch	Total
Sales	P 1,200,000	P 800,000	P 2,000,000
Less: Variable expenses	(840,000)	(360,000)	(1,200,000)
Contribution margin	P 360,000	P 440,000	P 800,000
Less: Traceable fixed expenses	(210,000)	(180,000)	(390,000)
Segment margin	P 150,000	P 260,000	P 410,000
Less: Common fixed expenses	(180,000)	(120,000)	(300,000)
Profit (loss)	(P 30,000)	P 140,000	P 110,000

If Baguio Branch were eliminated, then its traceable fixed expenses could be avoided while the total common fixed expenses are merely allocated and would be unaffected.

REQUIRED:

A) What will be the new company profit (loss) if Baguio Branch is eliminated?
B) What will be the decrease in over-all profit if Baguio Branch is closed and 25% of its traceable fixed expense would remain unchanged while Cebu's sales would decrease by 20%?

6. SHUTDOWN POINT

Blackpink Company expects that the volume of sales will drop below the current level of 5,000 units per month. An operating statement prepared for the monthly sales of 5,000 units show the following:

Sales (5,000 @ P 3)		P 15,000
Less:		
Variable costs (5,000 @ P 2)	P 10,000	
Non-variable costs	5,000	15,000
Net income		- Nil -

If plant operations are suspended, a shutdown cost (i.e., plant maintenance and real property taxes) of P 2,000 per month will remain as incurred. Since there is no immediate possibility of profit under present conditions, the problem of the company is just how to minimize the loss.

REQUIRED:

A) Shutdown point in units.
B) Should the company continue or shut down operations if the company expects sales to be:
   1) 4,000 units? 2) 2,000 units? 3) 3,000 units?

7. SELL or PROCESS FURTHER

EXO Company produces four products for a joint cost of P 10,000. The products are currently processed beyond the split-off point, and the final products are sold as follows:

Products	Sales	Additional Processing Cost
M	P 40,000	P 26,000
I	30,000	14,000
L	20,000	12,000
O	1,500	2,000

The company could sell the products at the split-off point for the following amounts:

M	P 15,000
I	11,000
L	6,000
O	0

REQUIRED:

A) Which product (s) should be sold at the split-off point?
B) If EXO Company can either sell all products at the split-off point or process all products beyond split-off point, which is the better option?

8. BEST PRODUCT COMBINATION

Girls Generation Co. produces three products: A, B and C. One machine is used to produce the products. The contribution margins, sales demands, and time on the machine (in minutes) are as follows:

	Market Limit	Selling Price	Unit Variable Cost	Minutes on Machine
A	100 units	P 30	P 10	10 per unit
B	80 units	P 25	P 7	5 per unit
C	150 units	P 40	P 15	10 per unit

There are 2,400 minutes available on the machine during the week. Total fixed cost is P 5,000.

REQUIRED:

A) What is the best product combination that maximizes the company profit?
B) How much is the profit associated with the best product combination?

9. LINEAR PROGRAMMING

Super Junior Company has an available 120 meters of Material 1 and 80 grams of Material 2 to produce its products A and B:

	Product A	Product B
Unit Contribution Margin	P 3	P 4
Required Materials:		
Material 1	2 meters	5 meters
Material 2	4 grams	2 grams

REQUIRED:

A) Objective function - involving maximization of the company's contribution margin.
B) Non-negativity constraint function
C) Constraint function for Material 1
D) Constraint function for Material 2
E) Optimal product mix

10. EXPECTED VALUE

Aespa Company prepared the following probability distribution describing the relative likelihood of monthly sales volume levels and related profit (loss) for its lone product that sells for P 50 per unit:

Sales volume	Probability	Profit (Loss)
6,000	10%	(P 70,000)
12,000	30%	10,000
18,000	20%	60,000
24,000	30%	100,000
30,000	10%	140,000

REQUIRED: Using the expected value approach,

A) How much is the budgeted sales for the month?
B) What is the expected value of the monthly profit?

11. INDIFFERENCE POINT UNDER PROFITABILITY ANALYSIS

NCT Company plans to introduce a new product that requires an initial cash investment of P 44 M. If the product becomes successful, the net cash inflow is forecasted at P 80 M. However, if the product becomes a failure, net cash inflow is estimated at P 20 M.

REQUIRED:

A) If the success rate is 70%, what is the value of act "to invest?"
B) What probability-percentages should be assigned to the events 'success' and 'failure' to be indifferent between the two actions "to invest" and "not to invest?"

12. JOINT PROBABILITY

GOT7 Company has three sales departments, each contributing the following percentages of total sales: Alcohol, 30%; Beverages, 50%; and Cigars, 20%. Each department has had the following average annual damaged goods rates: Alcohol, 10%; Beverages, 12%; and Cigars, 5%. A random corporate audit has found a weekly damaged goods rate of sufficient magnitude to alarm GOT7's management.

REQUIRED:

Determine the probability in percentage that the damage occurred in the:

A) Alcohol department B) Beverages department C) Cigars department

13. DECISION TREE

A wine maker must decide whether to harvest grapes now or in four weeks. Harvesting now will yield 100,000 bottles of wine, netting P 2 per bottle. If the wine maker waits for four weeks and weather turns cold (probability: 20%), the yield will be cut in half but net P 3 per bottle. If the weather does not turn cold, the yield depends on rain. With rain (probability: 50%), a full yield netting P 4 per bottle will result. Without rain, there will still be a full 100,000-bottle yield, but the net amount will be P 3 per bottle only.

REQUIRED:

Determine the optimal expected value.

WRAP-UP EXERCISES

(*Sources:* CMA/CIA/RPCPA/AICPA/Various test banks)

1. Identify the best description for *relevant costs* in decision-making process.
   a. Past costs that are expected to be different under each alternative
   b. Past costs that are expected to be the same under each alternative
   c. Future costs that are expected to be different under each alternative
   d. Future costs that are expected to be the same under each alternative
2. A cost incurred in the past and hence irrelevant for current decision making is a:
   a. Sunk cost
   b. Fixed cost
   c. Direct cost
   d. Discretionary cost
3. Which of the following costs is generally considered *irrelevant* in decision-making process?
   a. Direct labor
   b. Direct materials
   c. Fixed factory overhead
   d. Variable factory overhead
4. Which of the following cost classification schemes is most relevant to decision making?
   a. Fixed vs. variable
   b. Direct vs. common
   c. Joint vs. common
   d. Avoidable vs. unavoidable
5. An opportunity cost is usually:
   a. Relevant and part of traditional accounting records
   b. Relevant, but not part of traditional accounting records
   c. Irrelevant, but part of traditional accounting records
   d. Irrelevant and not part of traditional accounting records
6. In a *make-or-buy* decision
   a. Only variable costs are relevant
   b. Only conversion costs are relevant
   c. Fixed costs that can be avoided in the future are relevant
   d. Fixed costs that will continue regardless of the decision are relevant
7. In a *make-or-buy* decision, the cost to buy is compared with the
   a. Total cost to make
   b. Relevant cost to make
   c. Variable manufacturing costs
   d. Variable selling & administrative expenses
8. What is the opportunity cost of making a product in a factory where there is no alternative use of the capacity?
   a. Zero
   b. Fixed costs of the component
   c. Variable costs of the component
   d. Total manufacturing costs of the component
9. In an *accept-or-reject* decision, which cost is usually considered to be irrelevant?
   a. Fixed cost of the product
   b. Variable cost of the product
   c. Direct fixed costs associated with the order
   d. Opportunity costs of the temporary idle capacity
10. If there is an *excess* capacity, then the minimum acceptable price for a special order must cover
    a. Usual fixed manufacturing costs
    b. Variable and usual fixed manufacturing costs
    c. Variable and incremental fixed costs associated with the special order
    d. Variable manufacturing costs plus contribution margin foregone on lost regular units.
11. If a company is operating at *maximum* or *full* capacity, the minimum special-order price must cover
    a. Variable costs associated with the special order
    b. Variable and incremental fixed costs associated with the special order
    c. Variable and fixed manufacturing costs associated with the special order
    d. Variable costs and incremental fixed costs associated with the special order plus contribution margin foregone on regular units not produced.
12. If the margin lost by dropping a product line is higher than avoidable fixed costs, then the product line
    a. Operates at a loss
    b. Shall be shutdown
    c. Shall be continued
    d. Has no impact on company profit
13. Assuming there is a material amount of shutdown costs, then the shutdown point must be
    a. Nil or zero
    b. Below its break-even point
    c. Above its break-even point
    d. Equal to its break-even point
14. Which is usually considered *irrelevant* in 'sell or process further' decision making?
    a. Joint costs
    b. Further processing costs
    c. Sales value at the split-off point
    d. Sales value after further processing
15. A company that has a limited number of machine hours and abundant labor hours should produce first the product that has the highest
    a. Demand in units
    b. Contribution margin per unit
    c. Contribution margin per labor hour
    d. Contribution margin per machine hour
16. In linear programming, the expression "Maximize Z = 1X + 2Y" is most likely a (an)
    a. Objective function
    b. Constraint function
    c. Cost function
    d. Restriction function
17. The term 'constraints' in a linear programming model generally refers to:
    a. Committed costs
    b. Inefficiencies
    c. Scarce resources
    d. Decision variables
18. Expected value in decision analysis is
    a. A standard deviation using the probabilities as weights.
    b. An arithmetic mean using the probabilities as weights.
    c. A standard deviation divided by the coefficient of variation.
    d. A measure of the difference between best possible outcome and outcome of the original decision

"The capacity to learn is a gift; the ability to learn is a skill; the willingness to learn is a choice." Brian Herbert