Short Term Decision Making

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Exercise 01

The annual production capacity of ABC Ltd which makes product D is 200,000 units. The company currently is operating at 85% of the activity level. The variable cost of unit D is Rs25/- and the annual fixed cost is Rs250,000/-. A special order of 15,000 units of D is received to the company from a new customer.

If the company agrees to accept this order, determine the incremental cost of the decision.

Exercise 02

KYC Company produces two products of A and B. A special order of 1,500 units of A was received from a new customer. The fixed cost will be increased by Rs5,000/- due to the acceptance of this order. If the order is accepted, 3 units of product B already produced by the company will have to be dropped to produce 01 unit of this order as the labour is limited.

Unit variable cost and selling price of each product are as follows;

	A	B
	Rs.	Rs.
Selling Price	25.00	20.00
Variable Cost	15.00	12.00

You are required to calculate the relevant cost of this decision.

Exercise 03

KK company has been approached by a customer who would like special job to be done for him and he is willing to pay Rs100,000/- for it. The following raw materials are needed for this job.

Material	Total units required	Units already in stock	Book value of units in stock Rs.	Realizable value Rs.	Replacement Cost
P	1,000	0	0	0	24
Q	1,000	600	8	10	20
R	1,000	700	12	10	16
S	200	200	16	24	36

Material Q is used regularly by the company and if material Q is required for this job, they would need to be replaced to meet other production demand.

Material R and S are in stock as a result of previous over buying and they have a restricted use. No other used can be found for material R. However Material S, could be used in another job as substitute for 300 units of material X which currently cost Rs20/- per unit. The company does not have any stock of material X at the moment.

You are required to compute the relevant cost of material for this job.

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Exercise 04

Jayantha PLC has been offered Rs100,000 by a prospective customer to make some purpose built equipment. The extra cost of the material would be Rs30,000.

There would also be a requirement for 2,000 labour hours. Labour wages are Rs10/- per hour, variable overhead is Rs5/- per hour and fixed overhead absorbed at the rate of Rs8/- per hour.

However, labour is limited supply and of the job is accepted, employees have to be diverted from other work which is expected to earn contribution of Rs12/- per hour towards fixed overhead and profit.

You are required to assess whether the contract should be undertaken.

Exercise 05

Following information is extraction from a manufacturing company per unit.

	Rs.
Director Material	40.00
Direct Labour	32.00
Variable Overhead	10.00
Fixed Overhead	20.00
Selling Price	150.00

Direct material cost and direct labour cost will be increased by 10% and 25% respectively in the next coming year.

Variable overhead is increased proportionately to direct labour cost and fixed cost is remained constant.

Required;

01. Present PV ratio

02. Selling price to be changed in the next year in order to maintain the present PV ratio.

Exercise 06

Following information is an extraction from CAC Ltd per unit

	Rs.
Variable Cost	60.00
Selling Price	100.00
Annual Fixed Overhead	600,000.00
Annual Qty of sales	30.000 units

Required;

a. PV ratio

b. BEP units

c. BEP in sales value

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d. No. of units to be produced and sold for obtaining an annual profit of Rs.200,000/- sales value of it.

e. If variable cost per unit is increased by 25% and fixed cost is increased by Rs100,000, how many units should be produced and sold in order to obtain the present profit while selling price remains unchanged and sales value of it.

Exercise 07

Following information is an extraction from GAP Ltd per unit.

	Rs.
Selling Price	1,500.00
Direct Material	500.00
Direct Labour	300.00
Variable Overhead	200.00

- It is expected to increase the RM cost by 25% and DL cost by 20% in the next year.
- Present annual production capacity is 2000 units.
- Present annual fixed cost is Rs600,000.

Required;

01. Compute the increase in the selling price required in the next year to maintain the present PV ratio.
02. Compute the extra sales volume required to earn the present net profit, if the fixed cost is increased by Rs102,500 in the next year while keeping the selling price constant.
03. Compute the profit in the next year considering the fixed cost is increased by Rs100,000 while keeping present PV ratio remain constant.

Exercise 08

Sales value and profit of XYZ Company in respect of 2 years are given below.

Year	Sales	Profit
1	5,000,000	500,000
2	7,500,000	1,000,000

The selling price was not changed during these two years and also fixed cost of the company is not changed.

Required;

01. BEP in Sales Value
02. Sales value to obtain a profit of Rs1,500,000/-
03. Profit to be earned when sales value of the company is Rs6,000,000

Exercise 09

The following information is provided of Singha Company for the last year.

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Unit selling price	Rs.	100
Unit variable cost	Rs.	60
Total fixed cost	Rs.	20,000
Sales unit		2,000

You are required to prepare

a) Traditional breakeven chart showing the breakeven point in units and in value. Margin of safety in units and in value.

b) The contribution break even chart

c) Profit Volume Chart

Exercise 10

Following information is available is respect of 3 products of Bimbos Company.

Product	Sales Value (Rs.)	Variable Cost (Rs.)
A	300,000	240,000
B	80,000	40,000
C	120,000	70,000

Annual fixed cost of the company is Rs.100,000.

You are required to draw a multiple product profit volume chart and obtain the sales value at the break-even point from the graph.

Exercise 11

GEC PLC manufactures product A, B and C. The number of units sold of A, B and C in the ratio of 1:2:3. The total monthly manufacturing capacity of the company is 50,000 units (total of all products) and total expected monthly sales are 36,000 units.

The budgeted information for each product is as follows. (per unit)

	A	B	C
Selling price Rs	100	160	240
Variable cost Rs	55	100	200

The budgeted monthly fixed costs are as follows;

	Rs.
Manufacturing	900,000
Advertising	300,000
Administration	300,000

You are required to;

a) Draw multiple product volume chart and indicate the break-even point and margin of safety on the graph.

b) Determine maximum monthly budgeted fixed advertising cost increase which could be accommodated in expectation of a 20% increase in expected monthly sales. Assume that sales price and all other fixed cost will remain unchanged.

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Exercise 12

BCG Company sells three products P Q and R in the ratio 1:1:2 (in terms of the number of units sold). You are given following additional information.

	P	Q	R
Unit selling price Rs.	50	50	85
Unit variable cost Rs.	30	45	60

Annual fixed cost of the company is Rs5.4Mn.

You are required to;

a) Determine the breakeven sales in units and in values for each product.

b) Calculate the margin of safety in units at this level of demand. Assume that the current demand of the product P, Q and R are 100,000, 100,000 and 200,000 respectively.

Exercise 13

CPD Company manufactures three types of products P, Q and R. The budgeted selling price and volumes for the next year are as follows;

	P	Q	R
Selling price Rs.	110	160	120
Units	20,000	22,000	26,000

Product is made using a different mix of same material and labour. The standard cost card for each product is shown below.

	P	Q	R
Material A Rs.	12	28	16
Material B Rs.	8	22	26
Skilled Labour Rs	16	34	22
Unskilled Labour Rs	14	20	28

Both skilled and unskilled labour costs are variable. The general fixed overhead expected to be Rs640,000 for the next year.

You are required to;

a) Calculate the contribution to sales ratio for the company

b) Calculate the break-even sales in units and in value for each product.

Exercise 14

Following details extracted from CMC Ltd for the product X and Y.

	X (Rs.)	Y (Rs.)
Direct material	20	30
Direct labour cost	10	15
Variable overheads	20	25
Total variable cost	50	70

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Labour cost is Rs5/- per hour. Nit selling price of product X and Y is Rs80/- and Rs100/- respectively. During the month of July, the available direct labour is limited to 18,000 hours. Sales demand in July is expected 3,000 units and 5,000 units for the product X and Y respectively. Fixed cost of the month is Rs110,000.

You are required to;

a) Determine the production plan that will maximize the profit.

b) Compute the profit based on the above production plan.

c) Determine the maximum rate that can be paid direct labour hour if the additional labour can be obtained.

Exercise 15

GST Company produces product A, B and C and you are given following details.

	A	B	C
Selling Price Rs.	600	1,200	1,600
Variable Cost			
Direct Material (Rs50 per unit)	200	350	700
Direct labour Rs.	100	200	500
Variable overhead Rs	160	320	450
Total variable cost Rs	460	870	1,650
Monthly sales Units	300	450	250

The directors of the company decided to produce at least 150 units for each product even with a loss in order to face market competition.

The available raw material quantity is limited to 6,250 units per month. The monthly fixed overhead cost is Rs75,000.

You are required to;

a) Advise the best suitable mix of products.

b) Compute the monthly profit of the company.

Exercise 16

Paranthan Ltd manufactures two different types of products namely X and Y. There is a substantial demand for both products and the selling price and the cost structure (per unit) as follows;

	X	Y
Selling price	42.50	53.50
Direct material Rs	7	9
Labour time minutes	6	9
Machine time minutes	5	4
Overhead Rs.	2	4

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50% of overhead are considered as variable and cost of labour hour is Rs120. Cost of a machine hour is Rs150. During the next week, 45 labour hours 26 machine hours are available for production.

You are required to;

Develop a linear programming model and solve the same using linear programming graphical method to determine the best production mix of the company.

Exercise 17

A manufacturer produces two products namely Klunk and Klick. Klunk has a contribution of Rs. 3 and Klick of Rs. 4 per unit. The manufacturer wishes to establish the weekly production plan, which maximizes contribution.

Production data are as follows:

	Per Units		
	Machining (Hours)	Labour (Hours)	Material (Kgs)
Klunk	4	4	1
Klick	2	6	1
Total available per week	100	180	40

Because of a trade agreement, sales of Klunk are limited to a weekly maximum of 20 units and to honor an agreement with an old established customer at least 10 units to Klick must be sold per week.

You are required to;

Develop a linear programming model and solve the same using linear programming graphical method to determine the best production mix of the company.

Exercise 18

A manufacturer is to market a new fertilizer, which is to be mixture of two ingredients A and B. The properties of the two ingredients are;

	Bone meal	Nitrogen	Lime	Phosphate	Cost per Kg Rs.
Ingredient A	20%	30%	40%	10%	12
Ingredient B	40%	10%	45%	5%	8

It has been decided that;

a) A fertilizer will be sold in bags containing a minimum of 100Kgs

b) It must contain at least 15% nitrogen

c) It must contain at least 8% phosphates

d) It must contain at least 25% bone meal

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You are required to;

Develop a linear programming model and solve the same using linear programming graphical method to determine the optimum mix of ingredients as to minimize the cost.

Exercise 19

BigC PLC produces product R1 and R2 and the following information is provided to you for the next month.

	Per Unit Requirement		Available Quantity
	R1	R2	
Direct Material	0.25 Kg	0.5 Kg	1,000 Kg
Skilled Labour (hours)	2	1	4,000
Unskilled Labour (hours)	1	1	3,000

The price of material kilogram is Rs.1,000 and the rate per skilled labour hour and unskilled labour hour is Rs.250 and Rs.150 respectively. The unit selling price of R1 and R2 is Rs.1,200 and Rs.1,000 respectively. However, as per a market research, the maximum number of Units that can be sold per month from product R1 would be limited to 1,500.

01. You are required to develop a linear programming model and solve the same using linear programming graphical method to determine the nest product mix to the company.

02. You are required to develop a linear programming model and solve the same using linear programming simplex method to determine the nest product mix to the company.

Make or Buy Decision

Exercise 20

GMG Plc makes the product X and the cost structure per unit is as follows;

	Rs.
Direct material	300
Direct labour cost	200
Variable overhead	100
Fixed overhead	150
Total cost	750

Annual production capacity of product X is 1,000 units. GMC Plc has agreed with the purchasing manager of the company to continuously provide product X at Rs625 per unit.

Required;

a) Determine whether the product X should be produced with in the company or should be purchased from the supplier.

b) If the annual fixed cost going to be increased by 20,000 due to manufacturing of product X, will there be any change in your decision?

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c) The company can alternatively produce product Z, utilizing the resources required for product X. The unit selling price of product Z is Rs650 and the unit variable cost details are as follows;

	Rs.
Direct material	275
Direct labour	175
Variable overhead	125

Further, an additional fixed cost of Rs50,000 is also to be incurred in producing Z, and 1000 units can be produced annual from product Z also. If the information is (b) above is also relevant, will there be any change in your decision?

Exercise 21

JK PLC is considering the introduction a new product, a skin lotion that will be sold in a tube. The product will be sold to wholesaler at Rs80/- per tube. Fixed cost of Rs1Mn will be absorbed by the product when allocating a fair share of the company's current fixed cost to the new product. Estimated production and sales for the first year will be 100,000 tubes.

Direct Material Cost	Rs. 30/-
Direct Labour Cost	Rs 20/-
Total Overhead cost	Rs. 15/-

The company is considering to purchase empty tubes from an outside supplier at Rs9/- per tube. If the empty tubes are purchased outside, the direct labour and variable overhead would be reduced by 10% while direct material would be reduced by 20%.

You are required to

a. Determine whether the company should manufacture the empty tubes or buy the empty tubes from outside supplier.

b. Calculate the maximum purchase price that company would be willing to pay for an empty tube if the company purchases from an outside supplier.

Exercise 22

Radio spare parts manufacturing company manufacture product X and the unit cost is Rs6.25. The same is available in the market at Rs5.75 with an assurance of continued supply. The analysis of unit cost of X is as follows;

Direct material	Rs. 2.75
Direct labour	Rs. 1.75
Other variable cost	Rs. 0.50
Fixed cost	Rs. 1.25

You are required to;

a. Advise whether to manufacture X or buy it from market

b. If an outside supplier offer a unit of X at Rs4.85, advice whether the offer should be accepted or not by the company.

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Make or Buy Decision with a limiting factor

Exercise 23

Veco Plc produces 3 products A,B and C using the same type of machines. The company expects to produce and sell 4,000 units from each product for a week. Following information is related to a unit of each product.

Product	Machine Hour	Variable cost Rs.	Selling Price Rs.
A	3	20	35
B	2	36	45
C	4	24	40

The machine hours available for a week are limited to 20,000.

Sunken Plc has agreed to supply each product for the following prices.

Product	Rs.
A	29
B	40
C	34

You are required to;

a) Determine the production plan which maximizes the profit of the company.

b) If the fixed cost of the company for a week is Rs60,000: compute the maximum profit for a week.

Accept or reject special orders

Exercise 24

CC Company manufactures and sells product X at Rs60 per unit. Unit variable cost is Rs35.

KK Company has placed a special order of 5,000 units for product X and agreed to pay Rs45 per unit. If the CC Company is going to accept this special order, an additional fixed cost of Rs25,000 has to be incurred.

Further, if this special order is accepted, the current demand of the company would be brought down by 500 Units.

You are required to determine whether the special order should be accepted.

Shout down decision

Exercise 25

You are given the following information of product S A T of Visual Plc for the last year.

Rs. Million	S	A	T
Sales value	50	40	60
Variable cost	(30)	(25)	(35)
Contribution	20	15	25
Fixed cost	(17)	(18)	(20)
Profit / (loss)	3	(3)	5

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Since the product A currently makes losses, the company is evaluating whether the production of product A should be stopped or not. The company absorbs the fixed overhead to each product on the direct labour hour basis.

You are required to

01. Advise the company on product A.
02. If an extra fixed cost at Rs5Mn should be incurred in the production of A, will there be change to your decision?
03. In additions to the information in above (2), the company is able to generate an income of Rs50Mn per year by producing product Y using the same resources utilized for product A. The annual variable cost and additional fixed cost of product Y would be Rs30Mn and Rs5Mn respectively. Will there be any change to your decision?

Exercise 26

Amana company consist of 4 divisions and you are given the following information of the company for the year 2014.

	Rs.
Sales	8,600,000
Cost of sales	(5,332,000)
Gross profit	3,268,000
Other expenses	(2,532,000)
Not profit or (loss)	736,000
	========

The directors are evaluating on the continuation of division K of the company.

The gross profit margin % of division K is the half of the gross profit margin of % of the company and its sales revenue is 10% of the sales revenue of the company. Rs325,000 is fixed out of the cost of the sales of the division K.

Other expenses of the division K are Rs175,000 and all them are fixed. Absorbed overhead of the company's head office amounting to Rs50,000 are included in the other expenses of the division.

If the division K is sold, it will be affected to drop the sales of other division of the company. The estimated lost contribution of this will be Rs120,000 per annum.

You are required to determine whether the division K of the company should be operated or not.

Further product processing decision

Exercise 27

Siva Plc produces product A,B, and C through process R. You are given the following information for the month of August 2015.

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	A	B	C
Selling price at split-off point Rs.	100	120	150
Selling price after further processing Rs	200	250	250
Further processing cost Rs	150,000	175,000	250,000
Production and sales (Units)	3,500	2,500	2,000

Joint cost for the month was Rs400,000 and the company apportions the joint cost using the physical unit basis among the products.

You are required to

a) Calculate and conclude whether any of the product should be further processed.

b) Calculate total profit for the month of August 2015 based on the above decision.

Extra shift decision

Exercise 28

New Anthony Plc produces product Q by operating only a single shift. The relevant information for the first half of the year 2015 is as follows;

	Rs.	Rs.
Sales value (10,000 units)		400,000
Variable cost		
Direct material cost	(120,000)	
Direct labour cost	(100,000)	
Variable overhead cost	(20,000)	(240,000)
Contribution		160,000
Fixed Cost		(60,000)
Profit		100,000
		=======

Additional demand of 8,000 units of product R at the current price is available and the company is expecting to operate an extra shift for the purpose. However, the company's current fixed cost will be increased by Rs25,000. If the company operates for an extra shift.

It is further expected that the unit labour cost for the extra shift will be increased by 20%. However, the company will be able to obtain 5% discount from its material suppliers for the extra raw material purchased for the extra shift.

You are required to determine whether the extra shift should be operated or not.

Exercise 29

Maxa Company produces 4 products. The budgeted data per unit of product P, Q R and S for the next month is as follows;

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	P	Q	R	S
Direct material cost (Rs)	60	180	70	120
Direct labour cost (Rs)	40	30	80	70
Labour hours	1	0.75	2	1.75
Variable overhead (Rs)	45	40	45	54
Selling price (Rs)	180	300	250	300
Demand (Units)	5,000	6,000	9,000	8,000

The company absorbs fixed costs on direct labour costs basis. Budgeted total fixed cost for the next month is Rs750,000. Available labour hours for the month are restricted to 36,000 hours.

You are required to

a) Compute the break even point in value and margin of safety in value for the company.

b) Compute the profit that would generate under the optimum sales mix.

c) Determine maximum rate that could be offered for additional labour.

d) Compute the cost to the company, if 1,200 hours of labour is wasted due to the idle time.

e) If product Q could be purchased from an outside supplier at Rs245 per unit and the supplier is willing to supply up to 6,000 units, determine whether should accept the offer. State other factors should also be considered.

f) Determine the best course of action, if the price at which the outside supplier is willing to supply Q is Rs225 per unit.

Exercise 30

Seiko Limited manufactures products X Y and Z. The number units sold of X, Y and Z is in the ratio of 1:2:3. The total monthly manufacturing capacity is 100,000 units (total of all products) and total expected monthly sales are 72,000 units.

The budgeted data per unit each product is as follows;

Rs.	**X**	**Y**	**Z**
Selling price	50	80	120
Variable cost			
Direct material	10	20	45
Direct labour	5	10	20
Variable overheads	5	10	20
Sales commission	7.5	10	15
	27.5	**50**	**100**

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The budgeted monthly fixed costs are as follows;

	Rs.
Manufacturing	600,000
Advertising	500,000
Administration	400,000
Total	**1,500,000**

You are required to,

a) Construct a multi-product profit volume graph and indicate the break-even point and the margin of safety on the graph.

b) Determine maximum monthly budgeted fixed advertising cost increase which could be accommodated in the expectation of a 10% increase in expected monthly sales. Assume that sales price and all other fixed costs will remain unchanged.

c) Determine the financial feasibility of a proposal made by the sales manager to increase the sales commission on the selling price to 20% on all sales whereby monthly sales could be increased by 10%.

d) Indicate, based on the original price/cost structure, the preference for production of X, X and Z under the each of following constraints assuming that there is no requirement maintain a particular sales mix.

   a. Total sales value is the limitation

   b. Raw material availability is the limitation

   c. Labour availability is the limitation

e) State 4 limitations of break-even analysis.

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