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Marginal Costing
Concepts + Question 1-7

- **WHAT IS MARGINAL COSTING?**

Marginal costing is a

- cost accounting technique that considers
- only the variable costs (direct materials, direct labor, and variable overheads)
- when determining the cost of producing one more unit of a product.

It helps businesses decide on pricing, production levels, and profitability.

In marginal costing:

- Fixed costs (rent, salaries, etc.) are not included in product costs.
- Only variable costs are considered when calculating the cost per unit.
- Contribution margin (sales revenue minus variable costs) is used to cover fixed costs and generate profits.

Marginal costing is useful for short-term decision-making, such as:

- Determining the minimum price to charge for a product
- Deciding whether to accept a special order
- Evaluating the profitability of different products.
  Make or buy decisions
- Break-even analysis

Marginal Costing Formula:

- Contribution=Sales−Variable Costs
- Profit=Contribution−Fixed Costs

Where **Contribution** shows how much is left after covering variable costs to pay for fixed costs and profit.

Example:-

Item	**Amount (₹)**
Sales (1,000 units @ ₹10)	₹10,000
Variable Cost (₹6/unit)	₹6,000
Contribution	₹4,000
Fixed Costs	₹2,000
Profit	₹2,000

What is Variable and Fixed cost

Fixed costs and variable costs are two types of expenses businesses incur.

Fixed Costs:- These are costs that remain the **SAME I.E. FIXED** even if the business produces more or less of its product or service or even if it stops its production say for a month.

Examples include:

Rent, Salaries, Insurance, Depreciation, Loan payments

Fixed costs are typically time-related and don't change with production volume.

Variable Costs: -

These are costs **THAT CHANGES** in proportion to the quantity of goods or services produced.

Examples include:

Raw materials, Direct labor, Packaging, Fuel, Shipping costs

Variable costs increase or decrease as production volume changes. Higher is the production, higher will be the variable cost and vice versa.

Marginal costing (Samosa example)

Let's talk about how Marginal costing helps in real business ?

Let's say I am running a Samosa shop. I am selling samosa for Rs. 20 per unit.
My fixed expenses for a month in terms of rent, salaries, electricity are 36,000.
The manufacturing cost i.e. the cost of ingredients to prepare a samosa are say Rs. 8 per unit.
So, we have:-

- Selling price 20 per unit
- Variable cost 8 per unit
- Fixed cost 36,000

Now through marginal costing I have answers to the various questions like.

Ques. 1:- What I am getting from 200 samosas on a day.

Selling price – Variable cost =20-8= Rs.12
So, I am getting Rs. 12 per samosa and by selling 200 samosa daily,
I am getting 13×200 = 2,400
For 30days = 30× 2400 = Rs. 72,000

Now this 72,000 is not my profit, it is called as Contribution.

If I will deduct 36,000, fixed cost,
I have a profit of Rs. 72,000-36,000= 36,000 per month.

Q2: What is the minimum quantity of samosa that I need to sell to cover my fixed cost.

Ans: The formula for that is $\frac{\text{Fixed cost}}{\text{Selling price} - \text{Variable Cost}} = \frac{36,000}{20-8}$

$= 3,000$ i.e. $\frac{3,000}{30} = 100$ samosa a day, this is also called as Break even sales (sales required to cover your fixed cost)

So these kind of analysis and a lot more we get from the technique of marginal costing.

P/V RATIO

the KEY COMPONENT in Marginal costing

Profit-volume ratio indicates the relationship between contribution and sales and is usually expressed in percentage. A higher P/V ratio means the business earns more contribution (and potentially more profit) per rupee of sales.

P/v ratio is influenced by sales and variable or marginal cost.

- If the sale price increases without a corresponding increase in marginal cost, the contribution increases—and the profit-volume ratio improves.
- Similarly, if the marginal cost is reduced with sale price remaining same—profit-volume ratio improves.

Uses of P/V Ratio:

(i) It helps in the determination of Break-even-point [BEP = Fixed cost ÷ P/V ratio]
(ii) It helps in the determination of profit at any volume of sales
(iii) It helps in the determination of sales to earn a desired amount of profit
(vi) It helps in determining margin of safety [Margin of safety = Profit ÷ P/V ratio]

Let's say our selling price per unit is 100 and the variable cost per unit is 60.
Then Contribution will be 100 -60 = 40
i.e. for every one unit sold, we are getting a contribution of Rs. 40.

So, the P/V ratio will be = $\frac{40}{100} \times 100 = 40\%$

Which means if we do a sales of 10,000 we will get a contribution of
10,000 × 40% = 4,000

And if our Sales are say 250,000 our contribution will be
250,000 × 40% = 100,000.

So P/v ratio helps in giving us a straight figure of how much we have earned after subtracting our variable cost

P / V ratio Formulae

- If we want in % terms $= \frac{\text{Contribution}}{\text{Sales}} \times 100$

- If we want in per unit terms $= \frac{\text{Contribution per unit}}{\text{Selling price per unit}}$

- When we are given Sales and Profit of two years or two half years like in Q1

$$= \frac{\text{Change in Profit}}{\text{Change in Sales}} \times 100$$

BREAK EVEN SALES

Few lines that describe it are:-

- Where profit begins."
- "Sales that cover your costs—nothing more, nothing less."
- "The sales line between loss and gain."
- "Cross it, and profit starts."

- It is that amount of sales at which there is no profit no loss i.e. our total costs are equal to the sales amount.

- This is the initials sales which is required to cover our fixed cost.

By relating to the example I have given in the initial slides where I was talking about the Samosa business,
The break even sales was 100 samosas a day or 3,000 samosa a month.

Break even sales in Rs. terms
= 3000 units × Rs. 20= 60,000
So at Rs. 60,000 sales a month, there will be no profit no loss. If the sales are below this amount say 55,000 then there is a loss of 5,000 and if the sales are say 70,000, then there is a profit of 10,000.

Check:-
3,000 ×20 = 60,000 –Variable cost 3,000×8 – Fixed cost 36,000 = ZERO

Formula for Break Even Sales:-

- Break even Sales $= \frac{\text{Fixed Cost}}{\text{P/V ratio}}$ (For Answer in Rs.)
- Break even point $= \frac{\text{Fixed Cost}}{\text{Contribution per unit}}$ (For Answer in units)

Let’s begin the Questions
Ques. 1-10

Q1:	1st Half	2nd Half
Sales	1,00,000	1,20,000
Profit	30,000	38,000

Fixed cost during the 1st half is equal to that during the 2nd half. S.P & VC per unit will remain unchanged.

Compute:-

(a)P/V ratio for each half & for the year.

(b)Fixed cost for each half & for the year.

(c)BEP for each half & for the half.

(d)Half yearly sales to earn half yearly profit of Rs.40000.

(e)Annual Sales to earn annual profit of Rs 90000.

ANS (a) 40%; (b) Annual Fixed Cost:20000,BES for the year:50000; (d)125000;(e)275000

Q1 (a)

$$\textbf{P /V ratio} = \frac{\text{Change in Profit}}{\text{Change in Sales}} \times 100$$

$$= \frac{8{,}000}{20{,}000} \times 100$$

(b)	(Sales × P/v ratio) - Profit = Fixed Cost
	(100,000 ×40%) - 30,000 = 10,000
	Fixed cost = 10,000
	Annual Fixed cost = 10,000×2= 20,000

Sales (S) × P/v ratio $(\frac{C}{S})$ = C i.e. Sales × P/v ratio gives us Contribution

Contribution – profit = Fixed cost

(C)	Break even Sales= $\frac{\text{Fixed Cost}}{\text{P/V ratio}}$	$=\frac{10,000}{40\%}$ = 25,000

Annual Break even Sales = 25,000 *2 half years= 50,000

Now for the last part:-

We know the formula:-Sales = $\frac{\text{Contribution}}{\text{P/V ratio}}$

$= \frac{\text{Fixed cost + Profit}}{\text{P/V ratio}}$ **(as C =FC + P)**

Now if want to know how much sales we needed for this much of profit we just need to change the fig. of profit and then we will get the required sales.

So the formula for Required Sales will become

$= \frac{\text{Fixed cost + Profit}}{\text{P/V ratio}}$

(d)	Required Sales = $\frac{\text{Fixed Cost + Profit}}{\text{P/V ratio}}$	$= \frac{10,000+40,000}{40\%}$ **=125,000**

(e)	**Required Sales =** $\frac{\text{Fixed Cost + Profit}}{\text{P/V ratio}}$	$= \frac{20,000+90,000}{40\%}$ **= 2,75,000**

Q2: (H.W.)From the following information

Find: P/V ratio;
Break even sales;
Profit when sales are Rs.18,00,000;
Sales required to earn a profit of Rs.120,000,
Margin of safety for 2007.

Year	Sales	Profit
2007	12,00,000	80,000
2008	14,00,000	1,30,000

ANS: 25%; 880,000; 230,000; 1360,000; 320,000

Q3: (a)A company earned a profit of Rs.30, 000 during the year. If the marginal cost and SP of a product are Rs.8 and Rs. 10 per unit respectively, find out the amount of margin of safety.

(b) If Margin of safety is Rs.240,000(40% of sales) and P/V ratio is 30% of sales of XY ltd. Calculate BEP & amount of profit on sales of Rs.900,000

ANS:150,000& 108,000, 162,000

MARGIN OF SAFETY?

Margin of safety is that sales which is achieved after the initial sales called as Breakeven Sales.

At Break even Sales, our fixed cost are fully absorbed or recovered, so beyond the break even sales, whatever is the contribution, its just the profit as there is no fixed cost.

And so the formula for Margin of safety is $\frac{\textbf{Profit}}{\textbf{P/V ratio}}$

We already know that Sales $= \frac{\text{Contribution}}{\text{P/V ratio}} = \frac{\text{Fixed cost + Profit}}{\text{P/V ratio}}$

Or breaking the numerator,

Total Sales $= \frac{\text{Fixed cost}}{\text{P/V ratio}} + \frac{\text{Profit}}{\text{P/V ratio}}$

Or Total Sales = Break even Sales + Margin of safety.

So Margin of safety $= \frac{\textbf{Profit}}{\textbf{P/V ratio}}$

Q3 (a)

SP	10
Less: VC	8
Contribution	2
P/V Ratio=	$=\frac{2}{10}\times 100=20\%$
Margin of safety $=\frac{\text{Profit}}{\text{P/V ratio}}$	$=\frac{30,000}{20\%}=150,000$

Q3 (b)

Margin of safety = 2,40,000 = 40% of Sales

$$\text{Sales} = \frac{2,40,000}{40\%} = 600,000$$

Break even Sales + Margin of Safety = Total Sales

Break even Sales =600,000-240,000=360,000

$$\text{Break even Sales} = 360,000 = \frac{\text{Fixed Cost}}{\text{P/V ratio}}$$

Fixed cost=360,000×30%=108,000

Profit= Sales × P/V ratio-Fixed Cost

900,000×30%-108,000=162,000

Q4: - A ltd budgets production of 10,000 units. The VC is estimated @12 per unit. The fixed costs are estimated to be 40,000. The SP is fixed to earn a profit of 25% profit on cost.

You are required to:
I) Compute BEP in terms of units and sales.
II) Compute how many units must be produced and sold to earn a profit of Rs.60, 000

ANS:100,000, 5000 units & 12,500 units

Q4 (I) **BEP** = $\frac{\text{Fixed cost}}{\text{Contribution per unit}} = \frac{40,000}{8}$ = 5,000 units or 5,000×20 = **Rs. 100,000**

(II) **Required Sales** = $\frac{\text{Fixed Cost + Profit}}{\text{Contribution per unit}} = \frac{40,000+60,000}{8}$ **=12,500 units**

Note:
Contribution per unit:-

VC =10,000 units ×12 = 120,000
FC = 40,000
Total Cost = 160,000
Add: Profit = 25% of Cost = 40,000
Sales = 200,000
SP per unit = 200,000 /10,000 units = Rs. 20
Contribution per unit = 20 -12 =8

Q5:- (a) Sale of a product amounts to 4,000 units p.m.@Rs.10 per unit. Fixed overheads are Rs.8,000& Variable cost is Rs.6 per unit. The manufactures proposes to reduce selling price by 10%. Calculate the present & future P/v ratio and find out how many units must be sold to maintain the same profit.

(b) A company earned a profit of Rs.60,000 during the year 07-08. If the marginal cost & the SP of a product are Rs.8 and Rs. 10 per unit resp., find out margin of safety.

ANS:40%, 33-1/3%, 8,000 units, 300,000

Q5 (a)

Current P/V ratio	$= \frac{4}{10} \times 100 = 40\%$
Future P/V ratio	$= \frac{9-6}{9} \times 100 = 40\%$
Current profit = 4×4,000 units	=16,000

Required Sales= $\frac{\text{Fixed Cost + Profit}}{\text{Contribution per unit}}$	$= \frac{16,000 + 8,000}{3} = 8,000$ units

Q5 (b)

Margin of safety = $\frac{\text{Profit}}{\text{P/V ratio}}$	$= \frac{60,000}{20\%} =$ Rs. 300,000

Q6: ABC ltd produces a variety of products each having a no. of components parts. Product B takes 5 hours to produce on a particular machine which is working at full capacity. B has a SP of Rs.100 & VC of Rs. 60 per unit.

A component part X -100 could be made on the same machine in 2 hours at a VC of Rs. 10 per unit.

The supplier price for the component is Rs. 25 per unit. Advice whether the company should buy the component X-100.

ANS: Should be bought.

Ans: To take a decision on whether we should buy this Part X or we manufacture this, we have to check the buying cost of this part vs. the manufacturing cost.

If the manufacturing cost is lower, we will not buy and vice versa.

Now if this part X is manufactured, we won't be manufacturing the product B. So real manufacturing cost of Part X would be the variable cost of part X + the contribution foregone of Product B

Product B	
SP	100
Less: VC	60
Contribution per unit	40
Contribution per hour	$\frac{40}{5}$ =Rs. 8

Part X	
VC	10
Add: Contribution foregone (Rs.8×2hours)	16
Manufacturing Cost	26
Supplier price	25

Advice: It is better to buy Part X from them market as the buying cost is lower than the manufacturing cost.

Q7: (a) Total fixed cost: 12,000
Contribution-20,000
No of unit's sold-10,000
Variable cost is 60% of sales
Determine the SP per unit and also the total profit& loss
ANS: Rs.5 and 8,000

(b)Total fixed cost: 12,000
Annual sales: 48,000
Margin of Safety-8,000
Find P/V ratio
ANS: 30%

(C) When output is 3,000 units, the average cost per unit is Rs.4. When output is 4,000 units, the avg cost is Rs.3.50 per unit. The BEP is 5,000 units. Find P/V ratio.
ANS: 37.50%

Q7(a)

Fixed cost =12,000
Contribution = 20,000
Profit = Contribution - Fixed cost
Profit = 20,000-12,000 = 8,000
VC = 60% of Sales, So P/V Ratio = 40% of Sales
Sales = $\frac{\text{Contribution}}{\text{P/V ratio}} = \frac{20,000}{40\%} = 50,000$
SP per unit = $\frac{50,000}{10,000} = \text{Rs. } 5$

Q7(b)

Fixed cost	12,000
Annual Sales	48,000
Margin of Safety	8,000
Break even Sales =48,000-8,000 = **40,000**	
Break even Sales = $\frac{\text{Fixed Cost}}{\text{P/V ratio}}$	$40{,}000 = \frac{12{,}000}{\text{P/V ratio}}$
P/ V ratio = $\frac{12000 \times 100}{40{,}000}$ = **30%**	

Before we proceed to part c, it is important to note that in part c, variable cost per unit is not given. To calculate it we will use this formula:- $\textbf{Variable cost per unit} = \frac{\textbf{Change in total cost}}{\textbf{Change in units}}$

Why?
Because if the cost is changed due to the change in the output, that change is due to variable cost only, as fixed cost remains fixed.

Q7(c)

Output	3,000 units	4,000 units
Total Cost	12,000	14,000

Variable cost per unit $= \frac{\text{Change in total cost}}{\text{Change in units}}$	$= \frac{14,000 - 12,000}{4,000 - 3,000} = \frac{\mathbf{2,000}}{\mathbf{1,000}} = \mathbf{Rs.\ 2}$

Fixed cost = Total cost - Variable cost	12,000 – (3,000×2) = 6,000
Break even Sales	= FC + VC = 5,000×2 +6,000 = 16,000
Break even Sales	$= \frac{\text{Fixed Cost}}{\text{P/V ratio}}$
BES =16,000	$16,000 = \frac{6,000}{\text{P/V ratio}}$
P/ V ratio	$= \frac{6,000}{16,000} \times 100$ **=37.50%**

Q8: VC per file Rs.40
Fixed cost: Rs 60,000
Production capacity: 3,000 Files; SP per file Rs.100

Compute

a) BEP
b) No of Files to be sold to earn a net profit of Rs.30000
c) If the firm manufactures & sells 500 files more per yr. with an additional fixed cost of Rs.2000, What should be the selling price to earn the same amt of profit as in (b) above

Ans: BEP: 1,000 units; (b) 1,500 files; (c) Rs.86

Q8

SP	100
Less:VC	40
Contribution	**60**

Break even Point	$= \frac{\text{Fixed Cost}}{\text{Contribution per unit}}$	$= \frac{60000}{60} = 1{,}000$ files

Required Sales	$= \frac{60{,}000+30{,}000}{60}$	$= \frac{\text{Fixed Cost+Profit}}{\text{Contribution per unit}}$
		=1,500 Files

Sales = 1500+500=2,000 Files
Sales= VC + FC +Profit
Sales = 2,000×40 + (60,000 + 2,000) + 30,000 =172,000
SP Per File= $\frac{1{,}72{,}000}{2{,}000}$ = Rs. 86

Q9: A retailer dealer in garments is currently selling 24,000 shirts P.a. Following are his details for yr. ended Dec 31, 2023

SP per shirt	40
VC per shirt	25
Fixed Cost:	
Salaries	1,20,000
General office cost	80,000
Advertising cost	40,000

Answer the following independently:

a) BEP & Marginal of Safety in Rs. & in Units
b) Assume that 20,000 shirts were sold in a year, what will be the profit
c) If it is decided to introduce a sales commission of Rs. 3 Per Shirt, how many shirts would require to be sold in a year to earn a net income of Rs.15,000
d) Assuming that for year 2007 an additional salary of Rs.33,000 is anticipated and price of shirt is likely to be increased by 15%,what should be the BEP in units & Rs.

Ans:(a)BES:16,000, 640,000; MOS: 8,000,320,000
(b)Rs. 60,000 (c)21,250 (d)13,000 or Rs. 5,98,000

Q9 (a)

SP	40
Less: VC	25
Contribution	**15**

Break even Point $= \frac{\text{Fixed Cost}}{\text{Contribution per unit}} = \frac{240{,}000}{15} =$ 16,000 shirts

Break even Sales = 16,000 units × 40 (Selling price) = Rs. 640,000

Margin of safety = Total Sales - Break even Sales

= 24,000units × 40-16,000 units × 40 (Selling price) = Rs. 320,000

In units = $\frac{320{,}000}{40\ (SP)}$ = 8,000 shirts

Q9 (b)

Profit on 20,000 shirts :-

= 20,000 units × 15 (Contribution per unit) – 240,000 (Fixed cost)

= 300,000 -240,000 = Rs. 60,000

Q9 (c)

$$\text{Required Sales} = \frac{\text{Fixed Cost + Profit}}{\text{Contribution per unit}} = \frac{240{,}000 + 15{,}000}{40 - (25+3)} = 21{,}250 \text{ shirts}$$

Q9 (d)

$$\text{Break even Point} = \frac{\text{Fixed Cost}}{\text{Contribution per unit}}$$

$$= \frac{240{,}000+33{,}000}{40\times 115\% - 25}$$

$$= \frac{240{,}000+33{,}000}{46-25}$$

$$= 13{,}000 \text{ shirts}$$

Break even Sales = 13,000 units × 46 (Selling price) = Rs. 598,000

Q10:-

(1) When sales decline from Rs.900,000 to 700,000,profit of Rs 50,000 is converted into loss of Rs. 50,000.Determine contribution margin ratio.

(2)A co has a Fixed Cost of Rs.20,000.It sells 2 products-A&B, in the ratio of 2 units of A & 1 unit of B. Contribution is Rs 1 per unit of A & Rs.2 per unit of B.
How many units of A & B would be sold at BEP

ANS: A=10,000 & B=5,000 units

Note:-

1. Contribution margin ratio is also called as P/V ratio.

2. Profit of Rs 50,000 is converted into loss of Rs. 50,000, that means the change in profit is 100,000 as if Profit of Rs 50,000 is converted into Zero, change would be 50,000 but here it is 50,000 loss. So, the change is 100,000

Q10			
	Sales	9,00,000	7,00,000
	Profit	50,000	-50,000

	A	B
Contribution per unit	1	2
Composite contribution*	2 units×1 + 1 unit×2	
* see the notes:-	**=Rs. 4**	

P/V ratio=	$\frac{\text{Change in profit}}{\text{Change in sales}} \times 100$	$\frac{100,000}{2,00,000} \times 100$

BEP	$= \frac{\text{Fixed cost}}{\text{Contribution per unit}}$	$= \frac{20,000}{4} = 5,000$ units

BEP units wise	A: 5,000 units × **2**	10,000 units
	B : 5,000 units × **1**	5,000 units

NOTES FOR Q-10

1. Composite contribution is the contribution of a LOT size. Here the lot is 2 units of A and 1 unit of B as A and B are sold in the ratio of 2:1

2. For BEP unit wise:- we will multiply 2 units for A and 1 unit of B as the company sells a and B in the ratio of 2:1.
So, if 1000 units of B were sold then 2000 units of A would have been sold.