

COSTING NOTES

Chapter – Standard Costing

Standard costing is Variance analysis between the Standard and Actual components. Variance Analysis shows the performance of company or a project with budgets / std.

Std. costing is defined by the ICMA, London, "As the preparation and use of Std. costs, their comparison with actual costs and the analysis of variances to their causes and point of incidence."

Std. costing is a system of costing which can be used in any method of costing, like job costing, process costing, etc.

1. Material Cost Variances
2. Labour Cost Variances
3. Overhead Variances
4. Sales Variances
5. Reconciliation between std. profit and actual profit

For **Cost variance = Std. – Actual** and for **Profit Variance = Actual – Std./Budgeted**.

1. Material Cost Variances:

Material cost = Qty. x Price (Q x P)

Std. Cost = Std. qty. x Std. Price (SQ*SP)

Actual Cost = Actual qty. x Actual Price(AQ*AP)

Material Variance occurs by two factors : 1. Usages (Qty.) , 2. Price

- Variance in usages is responsibility of production department to use unit in efficiently manner and reduce the scrap, abnormal losses.

- Variance in price is responsibility of purchase department to purchase raw materials at cheap rate and reduce cost to availed discount, etc

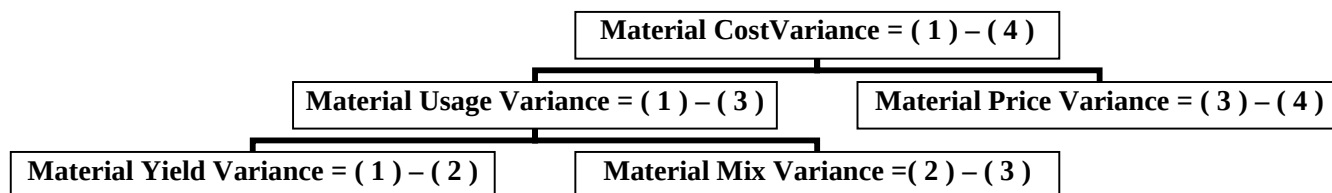
Material Cost Variance (MCV) =	Material Usage Variance (MUV) =	Material Price Variance (MPV) =
SMC – AMC	(SQ – AQ) x SP	(SP – AP) x AQ
(SQ*SP) - (AQ*AP)	(SQ*SP) – (AQ*SP)	(AQ*SP) – (AQ*AP)
	SMC – (AQ*SP)	(AQ*SP) – AMC

Material Yield Variance (MYV / MSUV / MQV) = (SQ – RSQ) x SP OR (SQ*SP) – (RSQ*SP)

Material Mix Variance (MMV) = (RSQ – AQ) x SP OR (RSQ*SP) – (AQ*SP)

Here, RSQ = Total Qty. in Std. Ratio

1	2	3	4
SQ * SP	RSQ * SP	AQ * SP	AQ * AP



MCV = MUV + MPV And MUV = MYV + MMV

2.Labour Cost Variances:

Labour cost = Labour hour x Rate (LH x R)

Std. Cost = Std. Hour x Std. Rate (SH*SR)

Actual Cost = Actual Hour x Actual Rate (AH*AR)

Labour Variance Occur by two factors: 1. Hour, 2. Rate

- Variance in hour is responsibility of Production department to use Labour efficiently manner.

- Variance in Rate is responsibility of HR department to hire the labour.

Table for basic Labour variance for 1st level understanding (for single unit variance)

Labour Cost Variance (LCV) =	Labour Eff. Variance (LEV) =	Labour Rate Variance (MRV) =
SLC – ALC	(SH – AH) x SR	(SR – AR) x AH
(SH*SR) - (AH*AR)	(SH*SR) – (AH*SR)	(AH*SR) – (AH*AR)
	SLC – (AH*SR)	(AH*SR) – ALC

1. Labour Cost Variance (LCV) = SLC – ALC OR (SH*SR) – (AH*AR)

2. Labour Time Variance (LTV) = (SH – AH) x SR OR (SH*SR) – (AH*SR)

3. Labour Rate Variance (MRV) = (SR – AR) x AH OR (AH*SR) – (AH*AR)

4. Labour Eff. Variance (LEV) = (SH – AHW) x SR OR (SH*SR) – (AHW*SR)

5. Labour Idle time (LIT) = (AH – AHW) x SR OR (AH*SR) – (AHW*SR)

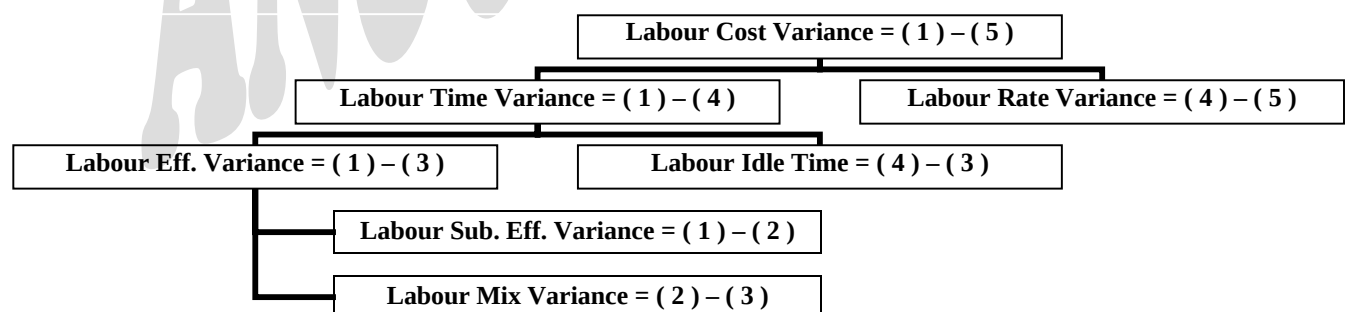
6. Labour Sub. Eff. Variance (LSEV) = (SH – RSH) x SR OR (SH*SR) – (RSH*SR)

7. Labour Mix Variance (LMV) = (RSH – AHW) x SR OR (RSH*SR) – (AHW *SR)

Here,

AHW = AH – Idle Time , RSH = Hour Worked in Std. Ratio (Actual hour * Std. Ratio)

1	2	3	4	5
SH*SR	RSH*SR	AHW*SR	AH*SR	AH*AR



Here,

LCV = LTV + LRV, LTV = LEV + LIT, LEV = LSEV + LMV

3. Overhead Cost Variances:

Overhead is indirect expenses of a company and they are absorbed in units produce by company in pre-determine basis.

Overhead Total Cost = Fixed Overhead Cost (FC) + Variable Overhead Cost (VC).

Overhead Total Cost Variance = Std. Total OH. Cost – Actual Total OH. Cost

Overhead Volume Variance = (Std. Qty. – Actual Qty.) x Std. F.OH./Unit

Overhead Expenditure Variance = (SR – AR) AH

Overhead costs Variance are mainly divided into two parts:

1. Fixed Overhead Cost Variance
2. Variable Overhead Cost Variance

Fixed Overhead Variances

1. Fixed OH. Cost Variance (FOCV) = SFO – AFO

* SFO = Overhead recovered by charging on actual units
 = AQ @ BFO/Unit
 = SH produce @ BFO/ Hour

* SH = AQ x BH/Unit

2. Fixed OH. Expenditure/ Budget Variance (FOEV / FOBV) = BFO – AFO

3. Fixed OH. Volume Variance (FOVV)

In Units = (AQ – BQ) x BFO/Unit

In Hour = (SH – BH) x BFO/Hour

In Budget = SFO – BFO

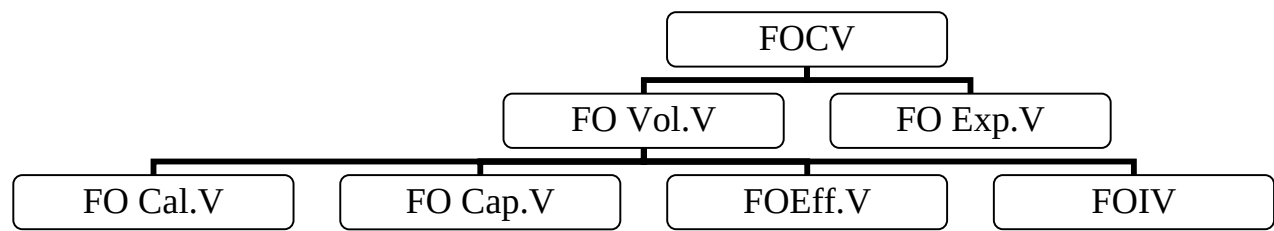
4. Fixed OH. Calendar Variance (FO Cal. V) = (Actual Days – Budgeted Days) x BFO/Day

5. Fixed OH. Capacity Variance (FO Cap. V) = (AH – RBH) x BFO/Hour

RBH = (Actual Days/ Budgeted Days) * Budgeted Hours

6. Fixed OH. Eff. Variance (FO Eff. V) = (SH – AHW) x BFO/Hour

7. Fixed OH. Idle Variance (FOIV) = Idle Hour * BFO/Hour



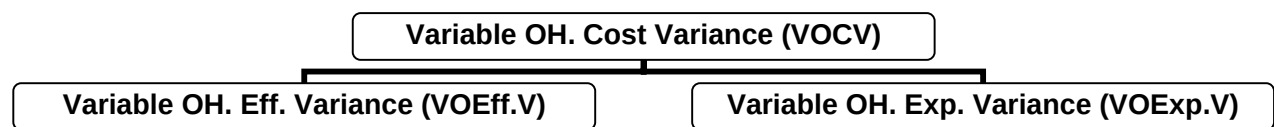
Variable Overhead Variances

1. Variable OH. Cost Variance (VOCV) = SVO – AVO

* SVO = AQ @ Std. V.OH/Unit
 = SH @ SVO / Hour
 = Overhead recover by Budgeted recovery rate.

2. Variable OH. Eff. Variance (VO Eff. V) = (SH – AH) x SR/Hour OR SVO – BVO

3. Variable OH. Exp. Variance (VO Exp. V) = (SR – AR) x AH OR BVO – AVO



4. Sales Variances :

Sales is a main goal of a profit generating entity so for achievement of future target study on sales is very important and it is responsibility of sales department to increase sales.

Sales Value = Unit Price (Qty.) X No. of Units (Price)

Std. Sales Value = Std. Qty. x Std. Price (SQ*SP)

Actual Sales Value = Actual Qty. x Actual Price (AQ*AP)

1. Total Sales Variance (TSV) = (AQ X AP) – (BQ X BP)

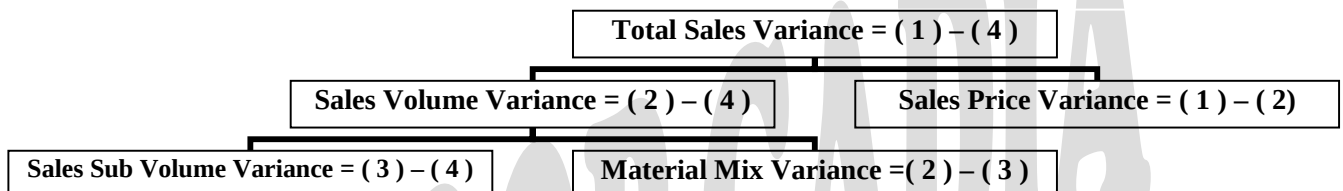
2. Sales Volume Variance (SVV) = (AQ – BQ) BP

3. Sales Price Variance (SPV) = (AP – BP) AQ

4. Sales Sub Volume Variance (SSVV) = (RBQ – BQ) x BP OR (RBQ * BP) – (BQ * BP)

5. Sales Mix Variance (SMV) = (AQ – RBQ) x BP OR (AQ * BP) – (RBQ * BP)

1	2	3	4
AQ * AP	AQ * BP	RBQ * BP	BQ * BP



5. Sales Margin Variances:

1. Total Sales Margin Variance = (BQ * BM) – (AQ * AM)

2. Sales Margin Volume Variance = (AQ – BQ) x BM

3. Sales Margin Price Variance = (AM – BM) x AQ OR (AP – BP) x AQ

6. Market Size / Market Share Variances:

1. Market Size Variance =

(Actual Market Size – Budgeted Market Size) x Std. % on Market x Std. Price

2. Market Share Variance =

(Actual Units Sold – Std. Share in Actual Market Size) x Std. Price

Some extra Variances:

Material Price Variance = (SP – AP) * Qty. Purchase

Sales Qty. Variance = (TAQ – TBQ) * Avg. Std. price

Reconciliation of Profit with Variances:

Particulars	Inner column	Outer column
Total Std. Sales	-----	
Std. Cost of Sales	-----	
	(1) Std. Profit	-----
Variances:		
MUV	-----	
MPV	-----	
LEV	-----	
LRV	-----	
Overhead Variance	-----	
SVV		
SPV		
	(2) Variance balance	-----
Actual Profit	(1) – (2)	-----

OR

Particulars	Inner column	Outer column
Budgeted Profit		(1)
Variances:		
MUV	-----	
MPV	-----	
LEV	-----	
LRV	-----	
VO Eff. V	-----	
VO Exp. V	-----	
FO Vol. V	-----	
FO Exp. V	-----	
SMVV	-----	
SMPV	-----	(2)
Actual Profit	(1) – (2)	-----

Above Reconciliation statement prepare on absorption concept. If we want to convert this format to marginal costing concept then ignore FO Vol. Variance because in marginal costing Fixed cost not calculated in per unit.

In absorption costing margin = Sales/unit – (VC/U + FC/U) but in marginal costing margin = Sales/unit – (VC/U), due to change in margin in marginal costing statement of reconciliation FO Vol. variance not taken into the calculation of Actual profit.

Accounting of Variances:

1. Partial Plan
2. Single Plan

1. Partial Plan:

In this plan the variance analysis done at the end of accounting period. So for this reason this plan not a very useful plan and also called as Delay Plan or Post-mortem Plan.

Raw material and WIP A/c OR Manufacturing A/c

B/d (Std. Cost)		Finished Goods (Std. Cost)	
Material (AQ*AP)			
Wages (AH*AR)			
AVO			
AFO		All Adverse variance	
All Favorable Variance		Closing Stock (Std. Cost)	

- ✓ Administration Cost Variance dealt in finished goods A/c.
- ✓ Selling and distribution Cost Variance dealt in cost of goods sold A/c.
- ✓ Sales Price and Volume Variance in Sales A/c.
- ✓ After that all variance transfer to Costing P&L A/c.

2. Single Plan:

In this plan all Variances is calculated at they incurred. Each a/c is transfer at Std. cost.

Particulars	Accounts	Cost	Integrated A/c	Non-integrated A/c
Purchase of Raw material	Purchase A/c To Bank A/c	(AQ*SP) (Adv.) (AQ*AP)	Store Ledger A/c Purchase Price V. To Bank A/c	Store Ledger A/c Purchase Price V. To CLC A/c
Issue of Raw to WIP a/c		(SQ*SP) (Adv.) (AQ*SP)	WIP A/c MUV A/c To Store Ledger A/c	WIP A/c MUV A/c To Store Ledger A/c
Wages incurred	Wages A/c To Bank A/c	(AH*SR) (Adv.) (AH*AR)	Wages Control A/c LRV A/c To Bank A/c	Wages Control A/c LRV A/c To CLC A/c
Wages Charged to WIP		(SH*SR) (Adv.) (AH*SR)	WIP Control A/c LEV A/c To Wages Control A/c	WIP Control A/c LEV A/c To Wages Control A/c
Variable Overhead	Direct Exp. A/c To Bank A/c	(AVO) (AVO)	Variable OH A/c To Bank A/c	Variable OH A/c To CLCA/c
Charged to WIP		(SVO) (Adv.) (Adv.) (AVO)	WIP Control A/c VO Eff. V. A/c VO Exp. V A/c To Variable OH A/c	WIP Control A/c VO Eff. V. A/c VO Exp. V A/c To Variable OH A/c
Fixed Overhead	Direct Exp. A/c To Bank A/c	(AFO) (AFO)	Fixed OH A/c To Bank A/c	Fixed OH A/c To CLCA/c
Charged to WIP		(SFO) (Adv.) (Adv.) (AFO)	WIP Control A/c FO Eff. V. A/c FO Exp. V A/c To Variable OH A/c	WIP Control A/c FO Eff. V. A/c FO Exp. V A/c To Variable OH A/c
WIP to F. Goods		(Std.) (Std.)	Finished goods A/c To WIP A/c	Finished goods A/c To WIP A/c

Administrative overhead	Expense A/c To Bank A/c	(Actual) (Actual)	Ad. OH control A/c To Bank A/c	Ad. OH control A/c To CLC A/c
Charge to finished goods		(Std.) (Adv.) (Actual)	Finished good A/c Ad. OH V A/c To Ad. OH control A/c	Finished good A/c Ad. OH V A/c To Ad. OH control A/c
S & D overhead	Expense A/c To Bank A/c	(Actual) (Actual)	S&D OH control A/c To Bank A/c	S&D OH control A/c To CLC A/c
Charge to Cost of Sales		(Std.) (Adv.) (Actual)	Cost of Sales A/c S&D OH V A/c To S&D OH control A/c	Cost of Sales A/c S&D OH V A/c To S&D OH control A/c

Raw material Control (RMC)A/c

To Balance b/d	Std. Cost	By WIP A/c	SQ*SP
To Purchase A/c	AQ*SP	By Costing P&L A/c	Adv. Variance
To Costing P&L A/c	Fav. Variance	By Balance c/d	Std. Cost

WIP Control A/c				Wages A/c (Variable and Fixed)			
To Balance b/d	Std.	By F. goods A/c	Std.	To Bank A/c	Actual	By WIP A/c	Std.
To RMC A/c	Std.			To P&L A/c	Fav.	By P&L A/c	Adv.
To Wages A/c	Std.	By Balance c/d	Std.				

Finished Goods A/c				Administration Overhead A/c			
To Balance b/d	Std.	By Cost of goods Sold A/c	Std.	To Bank A/c	Actual	By F. goods A/c	Std.
To WIP A/c	Std.			To P&L A/c	Fav.	By P&L A/c	Adv.
To Wages A/c	Std.	By Balance c/d	Std.				

Sales A/c

P&L A/c	Fav. Variance	Sales	Actual Sales
P&L A/c	Std. Sales	P&L A/c	Adv. Variance

Costing P&L A/c

Cost of goods sold	(Std. Cost)	Sales	(Std. Sales)
Adv. Variance	-----	Favorable Variance	-----
	-----		-----
	-----		-----
	-----		-----
Net profit	(Actual)		-----

Chapter - Marginal Costing

Marginal Cost means Change in total cost due to Change in one unit of output. In marginal cost all variable cost are change to the production but fixed cost of the period are to be W/o in which that cost are incurred .

Sales = Variable Cost + Contribution ($S = V + C$) AND
 Contribution = Fixed cost + Profit ($C = F + P$) AND
 Sales = Variable Cost + Fixed Cost + Profit ($S = V + F + P$)

BEP/ MOS Statement (Break even point / Margin of safety)

Particulars	BEP Sales	MOS Sales	Total Sales
Sales			
Less: Variable Cost			
Contribution			
Less: Fixed Cost		Nil	
Profit	Nil		

- $\text{BEP Sales (\%)} + \text{MOS Sales (\%)} = 100 \%$
- Contribution at BEP = Fixed cost
- Contribution at MOS = Profit
- Contribution on BEP + Contribution on MOS = Total Contribution
- Fixed Cost = BEP Sales * PV Ratio
- Profit = MOS sales * PV Ratio
- BEP Sales = Fixed Cost / PV Ratio
- MOS Sales = Profit / PV Ratio
- Variable cost = per unit cost is constant but change in total amount.
- Fixed cost = Change in per unit cost but total cost are constant.
- Semi variable Cost = It is Combination of Variable cost and fixed cost.
- If sales price constant than variable cost change in same ratio to sales changes.
- If sales price is change but sales Qty is same than Variable cost also constant but only change in P/V Ratio.
- Question say find out increase in sales price to req. BEP at% Than
 $\% \text{ increase in Sales price} = (\text{C.BEP} - \text{R.BEP}) / \text{R.BEP}$

Break Even Point (BEP) :

1. BEP in Amount : Fixed Cost / PV Ratio
2. BEP in units : Fixed Cost / Conti per unit

Profit – Volume Ratio (P/V Ratio):

1.	$\frac{\text{Contribution} * 100}{\text{Sales}}$	$\frac{C * 100}{S}$	$\frac{S - V * 100}{S}$	4.	$\frac{\text{Change in Contribution} * 100}{\text{Change in Sales}}$	$\frac{\Delta C * 100}{\Delta S}$
2.	$\frac{\text{Fixed Cost} * 100}{\text{BEP Sales}}$	$\frac{F * 100}{\text{BEP}}$		5.	$\frac{\text{Change in Profit} * 100}{\text{Change in Sales}}$	$\frac{\Delta P * 100}{\Delta S}$
3.	$\frac{\text{Profit} * 100}{\text{MOS Sales}}$	$\frac{P * 100}{\text{MOS}}$				

Other Types of BEP:

1. Cash BEP: In the Cash BEP in fixed cost taken at cash cost (only Cash cost), in this no non cash item not considered. e.g. Depreciation, W/o etc. This cost known as out of pocket fixed cost. This BEP is used in slack period for short time.
2. Composite BEP (Overall BEP) : BEP in case of two or more than two products combined BEP for one company.

Particulars	Unit A	Unit B
Sales	Rs. 20.00	Rs. 45.00
Variable cost	Rs. 15.00	Rs. 30.00
Contribution	Rs. 05.00	Rs. 15.00
Sales mix	6000 Unit	4000 Unit
P/V Ratio	1/4	1/3

Product A and B sales different product at different price and product have different cost and different sales mix. Required to find combined BEP of company in Amount when fixed cost = 360,000?

Answer:

In unit ratio – Avg. contribution per unit	In sales ratio – Avg. P/V ratio per unit
$(5 \times 6 + 15 \times 4) / 10 = \text{Rs. 9 per combo unit}$	$(5 \times 6 + 15 \times 4) / (20 \times 6 + 45 \times 4) = 30\%$
$360,000 / 9 = 40,000 \text{ units}$	$360,000 / 30\% = 1,200,000$
A $40,000 / 10 \times 6 = 24,000$, B $40,000 / 10 \times 4 = 16,000$	

3. BEP in case of opening stock :

Opening stock 6000 Unit @ Rs.10.00 (VC at 60%) = 60,000

Production 44000 Unit @ (fixed cost = 187000) = 484,000

Selling Price = Rs.10.50 in current year.

Answer:

Particulars	Total Cost	Variable cost	Per U.	Fixed cost
Opening stock	60,000	36,000	6.00	Not tr. In this year
Produce units	484,000	297,000	6.75	187,000

Contribution required for absorption of fixed cost Rs. 187,000

Contribution earn by opening units 6,000 $\times$ (10.5-6) Rs. 27,000

Balance contribution Rs. 160,000

$160,000 / 3.75 = 42,667$

Total sale of units = 6,000 + 42,667 = 48,667.

4. BEP in case of change in variable cost at various level of production.

First 5000 Units @ Rs. 3.00 Contribution 2.00

Next Units @ Rs. 2.80 Contribution 2.20

Sales price = Rs. 5.00 and fixed cost = Rs. 27500.00

Answer: 5,000 + 12,500 = 17,500

5. BEP in case of Differential fixed cost at differential production levels:

Sales price = 20.00 and VC = 15.00

Fixed cost , Rs. 30,000 up to 8000 units and Rs. 45000 above 8000 Unit.

Answer:

BEP up to 8000 units: $30,000 / 5 = 6,000 \text{ units}$

BEP above 8000 units: $45,000 / 5 = 9,000 \text{ units.}$

6. Cost BEP : it is used for profit earning capacity after a specific level of production.

Particulars	Plant A	Plant B
Variable cost (per unit)	8.00	6.50
Fixed cost	90,000.00	120,000.00

Which is more profitable and state the level in units and compare the cost per unit when production is 15000 units or 25000 units?

Answer:

$$(120,000 - 90,000) / (8.00 - 6.50) = 20,000 \text{ Units.}$$

7. BEP in case of semi variable cost:

Engine fixed cost = 32,000, Train bogie Fixed cost = 12,000

Capacity = 60 persons per bogie, Ticket Contribution = Rs. 300

Determine the BEP in Bogie number and in persons?

Answer:

Contribution per bogie = $300 \times 60 - 12000 = 6,000.00$

Bogie required for BEP = $32,000 / 6000 = 5.3333$ or 6.00

BEP tickets = $104,000 / 300 = 347$ tickets

8. BEP in case of merger of plants / company:

Particulars	Plant A	Plant B
Working capacity	70%	60%
Sales	350.00	240.00
VC	280.00	180.00
Contribution	70.00	60.00
Fixed cost	50.00	45.00
Profit	20.00	15.00

1. Find out the combined BEP of company?

2. Find out profit/loss at 50% capacity?

Answer:

(1) Fixed cost = $50.00 + 45.00 = 95.00$

Capacity at 100%	A	B	Total
Sales	500	400	900
Less: VC (100%)	400	300	700
Contribution	100	100	200

Common P/v ratio = $(200/900) \times 100 = 22.22\%$

Sales value on BEP = $95 / 22.22\% = \text{Rs. } 427.50$

(2) At 50 % capacity

Sales $900 \times 50\% = 450.00$

Contribution $450 \times 22.22\% = 100.00$

Less : Fixed cost = 95.00

Profit = 5.00

9. Profit BEP : in Amount : $(\text{Fixed cost} + \text{Desired profit}) / \text{PV ratio}$
in Unit : $(\text{Fixed cost} + \text{Desired profit}) / \text{Contribution per unit}$

Difference between marginal and absorption costing:

For understanding this we take common example for both marginal and absorption costing.

Example:

Sales	10, 00,000
Production cost (Variable)	4, 00,000
Production cost (Fixed)	2, 00,000
S&D cost (Variable)	2, 00,000
S&D cost (Fixed)	1, 00,000

Normal production in year is 10, 000 units.

Six month production is 5, 500 units and sales of 5, 000 units in this term.

Solution:

Absorption costing

- Absorption of production cost (Fixed cost) = $200,000/10,000 = \text{Rs. } 20.00$
Total absorption cost for six month = $5,500 * 20 = 110,000$

- Over absorption of production cost ;

Absorbed cost	110,000
To be absorbed $200,000/2$	<u>100,000</u>
Extra absorption of cost	10,000

Absorption costing

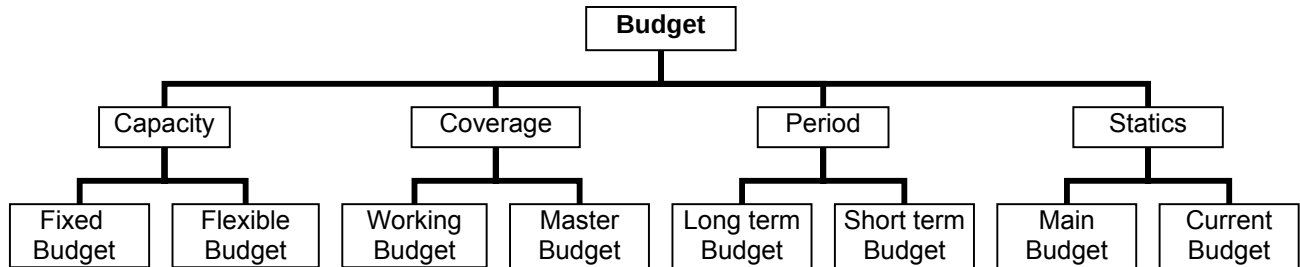
<u>Particular</u>			<u>Amount(Rs.)</u>
Income from sales of goods(A)	$5000 * 100$		500,000.00
Production cost			
Variable cost	$5500 * 40$	220,000.00	
Fixed cost	$5500 * 20$	110,000.00	
Total	$5500 * 60$	330,000.00	
Less: closing stock	$500 * 60$	30,000.00	
Total production cost		300,000.00	
Variable S&D cost	$5000 * 20$	100,000.00	
Fixed S&D cost	$100000/2$	50,000.00	
Total cost for sales (B)			450,000.00
Non adjusted profit			50,000.00
Over absorption			10,000.00
Actual profit			60,000.00

Marginal costing

<u>Particulars</u>			<u>Amount(Rs.)</u>
Income from sales (A)	$5000 * 100$		5,00,000.00
Variable cost			
Production	$5000 * 40$	200,000.00	
S & D	$5000 * 20$	100,000.00	3,00,000.00
Contribution			2,00,000.00
Fixed cost			
Production cost	$200,000/2$	100,000.00	
S & D	$100,000/2$	50,000.00	150,000.00
Actual Profit			50,000.00

Budgetary Control

Different Types of budgets:



Functional Budgets:

1. Sales Budget
2. Production Budget
3. Plan Usage Budget
4. Raw material Usage Budget
5. Raw material Purchase Budget
6. Direct wages Budget
7. Factory Overhead Budget
8. Production cost Budget
9. Closing stock Budget
10. Selling and distribution Budget
11. Administrative Budget
12. R & D Budget
13. Capital expenditure Budget
14. Cash Budget
15. Master Budget.

Example:

Sales Budget

Particulars	Product A			Product B			Total amount
	Qty.	Rate	Amount	Qty.	Rate	Amount	