chapter. standard Costing

special points.

profit = Sales − VC − FC

VC → DMC, DLC, V.OH

FC → F.OH

planning ✓ ✓ ✓ ✓ ✓ ✓ } Variance

Actual ✓ ✓ ✓ ✓ ✓ ✓ }

- Full chapter Contains discussion over 'should be' and 'Actual happened'.
- Variance means Comparison of actual and standard & calculation of difference.

- Variance may be favourable or unfavourable (Adverse)
- Favourable variance is denoted by F and Adverse variance is denoted by A.
- Actual profit if more than standard profit then favourable var. & vice-versa
- Actual cost if more than std. cost then Adverse Var & vice-versa.

Coverage under this chapter

1. calculation of variances
2. disposal of variances

③ Reconciliation st. (Absorption/ marginal Costing method)

④ Std. Costing with Activity based Costing / Learning Curve.

⑤ Planning & operating Variances

⑥ Misc. e.g fifo / lifo method

10 Box Approach

Example :→ A student decided to study Costing subject for 8 hours (budgeted input) in a day. It is Expected that one Question of Costing can be solved in half-an-hour. [budgeted input for 1 unit of output].

During a particular day, the student has actually studied for 10 hours (Actual input) & completed 12 Questions (Actual output).

Observations / Technical words

budgeted input = 8 hours)

budgeted input = 8 hours
budgeted input for 1 unit of output = $\frac{1}{2}$ hour

Actual input = 10 hours
Actual output = 12 Questions

1. In 8 hours, student should solve 16 Q.
This 16 Q is known as budgeted output in budgeted input.

$$= \frac{8 \text{ hours}}{\frac{1}{2} \text{ hour for 1 question}} = \frac{\text{budgeted input}}{\text{budgeted input for 1 unit of output}}$$

2. In 10 hours, the student should solve 20 questions. This 20 Q is Technically known as ~~budgeted output in Actual input/std. output in Actual input~~ Actual input

input/~~std. output~~ in ~~Actual input~~

~~10 hours~~ = Actual input

= $\frac{1}{2}$ hour For 1 Question budgeted input for 1 unit of output

3. The student should solve all the 12 Questions in 6 hour. This 6 hour is known as budgeted input for Actual output/std. input For Actual output

= 12 Questions × $\frac{1}{2}$ hour For 1 Question

= Actual output × budgeted input for 1 unit of output

budgeted output in budgeted I/P = Budgeted IIP

budgeted IIP for 1 unit of O/P

divide

budgeted O/P in Actual I/P = → Actual I/P / budgeted I/P For 1 unit of O/P

divide

budgeted I/P For Actual O/P = → Actual O/P x budgeted I/P For 1 unit of O/P

multiply

Trick to learn

① Numerator shall always be same

② input में divide करेंगे और output में multiply करेंगे

Concept No. 1 Direct Material Variances

Material Cost = Material Qty × Material Price p.u.

↓ Std. Qty ↓ Std. Price

Actual Qty Actual Price

Direct material Variances are of 5 types

① Direct Material Cost Variance :→

This Variance will arise when Total standard material Cost and Total actual material Cost is different.

DMCV = Total std. Mat. Cost − Total Actual mat. Cost

e.g. SQAO [std Qty for Actual QIP]

e.g. SQAO [illegible]

AQAO = Actual Qty for Actual O/P

= Actual Qty

BASIS should be same

DMCV = Total std. Material Cost (-) Total Actual Material Cost

(-)ve fav (Actual)

= SP × SQAO (-) AP × AQAO

= SP × SQAO − AP × AQ.

② Direct Material Usage Variance

↓

Qty

This Variance shall arise when Total standard material qty for Actual O/P

standard material qty for Actual O/P and total actual material qty for actual O/P is different.

Formula = $[SQAO - AQ] \times SP$

(3) Direct material price Var.

This variance shall arise when std. price per unit (of material) and actual price per unit (of material) is different.

Formula :→ $[SP - AP] \times AQ$

Concept of Direct material yield Var. & Direct material Mix Var.

D.M. Usage Var. = $[SQAO - AQ] \times SP$

e.g ✓Rice = high price item Qty ↓ × 100/kg (F)

✓Milk = low price item Qty ↑ × 10/kg (A)

✓Sugar = low price item Qty ↑ × 20/kg (A)

(F) High (F)

- Earlier Co. used to provide incentives to production manager on the basis of Favourable DM Usage Var.

∴ To Receive incentive, production mgr. increased the Qty of low price item (Low Adverse Usage Var.) & decreased the Qty of high price item (High Favourable Usage Var.)

By doing this prod. mgr. can manipulate Usage Var.

- This is a wrong way so to avoid such manipulation, Concept of DM yield & MIX Var. was developed.
- DM yield var. shows the actual performance of production mgr.

Hence Co. should provide incentive to prod. mgr. on the basis of yield Var

④ Direct Material yield Var. [Actual performance of prod. mgr.]

C.1 → This Variance shall be calculated only when more than 1 type of Raw material is used to mfd./produce FG.

SQAO RSQ AQ

	SQAO	RSQ		AQ
Rice	1kg	1.3kg	[1:2]	900 gram
milk	2kg	2.6kg		3kg
		3.90kg		3.90 kg

Formula = $[SQAO - RSQ] \times SP$

⑤ Direct material MIX Var

C.I This Var. shall be calculated only when more than 1 type of raw material is required to produce FGs.

Formula :→ $[RSQ - AQ] \times SP$

Mix Var. = Usage Var. (-) yield Var.

D.M. Cost Var. [DMCV]

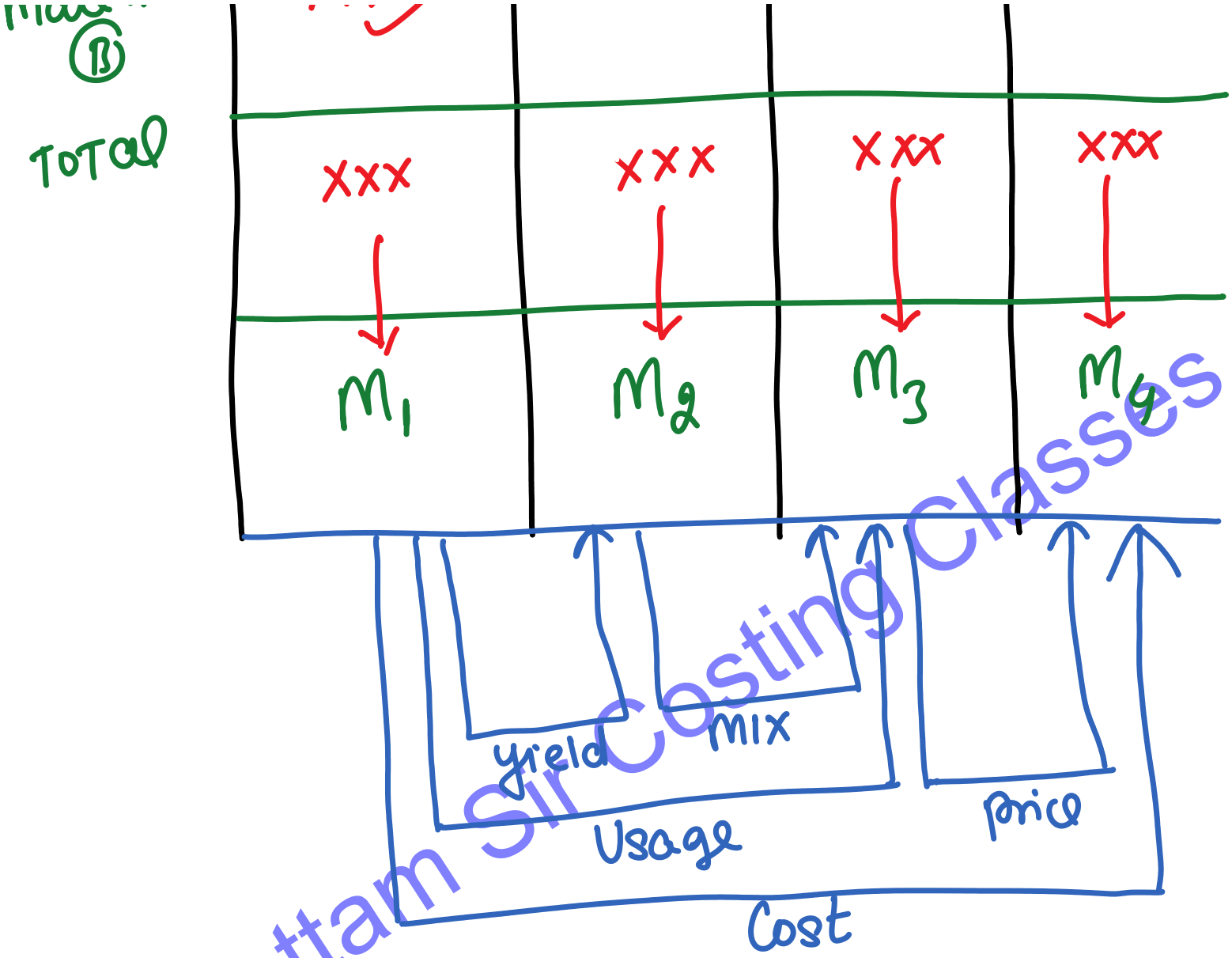
- D.M. Usage Var [DMUV]
  - D.M. Yield Var [DMYV]
  - D.M. Mix Var. [DMMV]
- D.M. Price Var [DMPV]

Note

1. = DMCV = DMUV + DMPV
2. = DMUV = DMYV + DMMV

Box No. 1 calculation of DM Variances

Particulars →	SP × SQAO	SP × RSQ	SP × AQ	AP × AQ ←
Material (A)	XXX ✓	XXX ✓	XXX ✓	XXX ✓
Material (B)	XXX ✓	XXX ✓	XXX ✓	XXX ✓



DmcV = $M_1 - M_4$

DmUV = $M_1 - M_3$

DmPV = $M_3 - M_4$

DmyV = $M_1 - M_2$

DmmV = $M_2 - M_3$

Note 1. Purchase mgr. is responsible for DMPV.

2. Production mgr. is responsible for DMUV.

Q.1 calculation of material Variances

Particulars	SP × SQAo	SP × RSQ	SP × AQ	AP × AQ
Material	Rs.1 × 300000 kg	Rs.1 × Not Applicable	Rs.1 × 280000 kg	Rs.0.90 × 280000 kg
Total (Rs)	300000 m_1	m_2	280000 m_3	252000 m_4

$$AP = \frac{\text{Actual Cost of material}}{\text{Actual Qty}} = \frac{\text{Rs. } 252000}{280000 \text{ kg}}$$

$$= \text{Rs. } 0.90 \text{ per kg}$$

$$SQAo = \text{Actual O/P} \times \frac{\text{budgeted I/P for 1 unit of O/P}}{\text{Total budgeted material}}{\text{Total budgeted O/P}}$$

$$= 210000 \text{ kg} \times \frac{100 \text{ kg}}{70 \text{ kg}} = 300000 \text{ kg}$$

DMCV = $M_1 - M_4$ = 3000 - 2520 = 480(F)

DMUV = $M_1 - M_3$ = 3000 - 2800 = 200(F)

DMPV = $M_3 - M_4$ = 2800 - 2520 = 280(F)

SP = Std. price

AP = Actual price

AQ = Actual Qty Consumed

RSQ = Revised std. Qty

[it means $\frac{\text{Total Actual Qty in std. material Qty Ratio}}{}$]

SQAO = Std. Qty for Actual O/P

= Actual O/P × budgeted I/P for 1 unit of O/P

= Actual O/P × $\frac{\text{Total budgeted Material}}{\text{Total budgeted O/P}}$

Q2 Calculations For material Variances

Particular	SP × SQAO	SP × RSQ	SP × AQ	AP × AQ
Material A	Rs 20 × 80.88 kg = 1617.78	Rs 20 × 80 kg = 1600	Rs 20 × 90 kg = 1800	Rs. 18 × 90 kg = 1620
material B	Rs 30 × 121.33 kg = 3640	Rs 30 × 120 kg = 3600	Rs 30 × 110 kg = 3300	Rs. 34 × 110 kg = 3740
TOTAL	5257.78	5200	5100	5360
	M_1	M_2	M_3	M_4

DMCV = $M_1 - M_4$ = 5257.78 - 5360 = 102.22 (A)

DMUV = $M_1 - M_3$ = 5257.78 - 5100 = 157.78 (F)

DMPV = $M_3 - M_4$ = 5100 - 5360 = 260 (A)

DMYV = $M_1 - M_2$ = 5257.78 - 5200 = 57.78 (F)

DMMV = $M_2 - M_3$ = 5200 - 5100 = 100 (F)

W. Note 1. Calculation of Revised std. Quantity (RSQ)

RSQ = Apportion Total AQ in std. qty Ratio

= [90kg + 110 kg] in [40:60] Ratio

= 200 kg in 40:60 Ratio

Material A (RSQ) = 80 kg

Material B (RSQ) = 120 kg

W.Note-2 Calculation of SQAO

Let us assume Total input be 100 kg

Then material A shall be = 40 kg

material B shall be = 60 kg

(-) Std. loss / Normal loss (10%) (10 kg)

Actual O/P 90 kg

SQAO = Actual O/P × budgeted I/P for 1 unit of O/P

SQAO [material A] = 182 kg × ~~Total std. material~~ / Total std. O/P

= 182 kg × 40 kg / 90 kg = 80.88 kg

SQAO [material B] = 182 kg × 60 kg / 90 kg = 121.33 kg

~~Alternative method to calculate SQAO~~

Normal loss is 10% of input Hence

output = 100% - 10% = 90% of input

182 kg = 90% x Input

Total Input (SQAo) = 202.22 kg

Now we will apportion total SQAo in std qty Ratio (40:60)

SQAo [material A] = $202.22 \times \frac{40}{100}$ = 80.88 kg

SQAo [material B] = $202.22 \times \frac{60}{100}$ = 121.33 kg

Concept No. 2 calculation of Direct material price Variance at the time of purchase

- DMPV is Computed for Actual Quantity Consumed.
- If we are required to calculate DMPV at the time of purchase then we need to simply Replace AQ Consumed by AQ purchased.

DMPV (at time of purchase) = $M_3 - M_4$ = SP × AQP − AP × AQP

where AQP = Actual Quantity Purchased

Q3 1 batch = 100 kg FG ⇒ 125 kg RM

AO = 5600 kg

Calculations for material Variances

Particulars	SP × SQAO	SP × RSQ	SP × AQ	AP × AQ
RM-A	Rs.20 × 3500 kg = 70000	Rs.20 × 3750 kg = 75000	Rs.20 × 4500 kg = 90000	Rs.21 × 4500 kg = 94500
RM-B	Rs.10 × 2100 kg = 21000	Rs.10 × 2250 kg = 22500	Rs.10 × 1500 kg = 15000	Rs.8 × 1500 kg = 12000
RM-C	Rs.5 × 1400 kg = 7000	Rs.5 × 1500 kg = 7500	Rs.5 × 1500 kg = 7500	Rs.6 × 1500 kg = 9000
Total	98000 (M1)	105000 (M2)	112500 (M3)	115500 (M4)

DMCV = M1 − M4 = 17500 (A)

DMUV = M1 − M3 = 14500 (A)

DMPV = $M_3 - M_4$ = 3000(A)

DMYV = $M_1 - M_2$ = 7000(A)

DMMV = $M_2 - M_3$ = 7500(A)

DMPV(at the time of purchase) = SP × AQP − AP × AQP
= (SP − AP) × AQP

material A = (20 − 21) × 5000 kg = 5000(A)

material B = (10 − 8) × 2000 kg = 4000 (F)

material C = (5 − 6) × 1200 kg = 1200 (A)

W.Note.1 Calculation of Actual Qty Consumed (AQ)

Total 125 kg of RM is used for 1 batch

Hence To produce 60 batches,

TOTAL Actual quantity Consumed = 125 kg × 60 batches
= 7500 kg

Ratio of Actual Qty Consumed = 60 : 20 : 20

AQ Consumed

material A = 7500 kg × $\frac{60}{100}$ = 4500 kg

material B = 7500 kg × $\frac{20}{100}$ = 1500 kg

material C = 7500 kg × $\frac{20}{100}$ = 1500 kg

W.Note 2 calculation of Revised Std. Qty

we need to apportion Sum of all AQ Consumed in Std. Qty Ratio.

TOTal AQ Consumed = 7500 kg

Std. Qty Ratio = 50:30:20

RSQ

material A = 7500 kg × $\frac{50}{100}$ = 3750 kg

material B = 7500 kg × $\frac{30}{100}$ = 2250 kg

material C = 7500 kg × $\frac{20}{100}$ = 1500 kg

W.Note.3 Calculation of std Qty For Actual OIP (SQAo)

SQAo = Actual OIP × budgeted IIP for 1 unit of OIP

budgeted Material

= Actual o/p × Total budgeted Material / Total budgeted o/p

Material A = 5600 kg × (125 kg × 50% / 100 kg) = 3500 kg (mat. A)

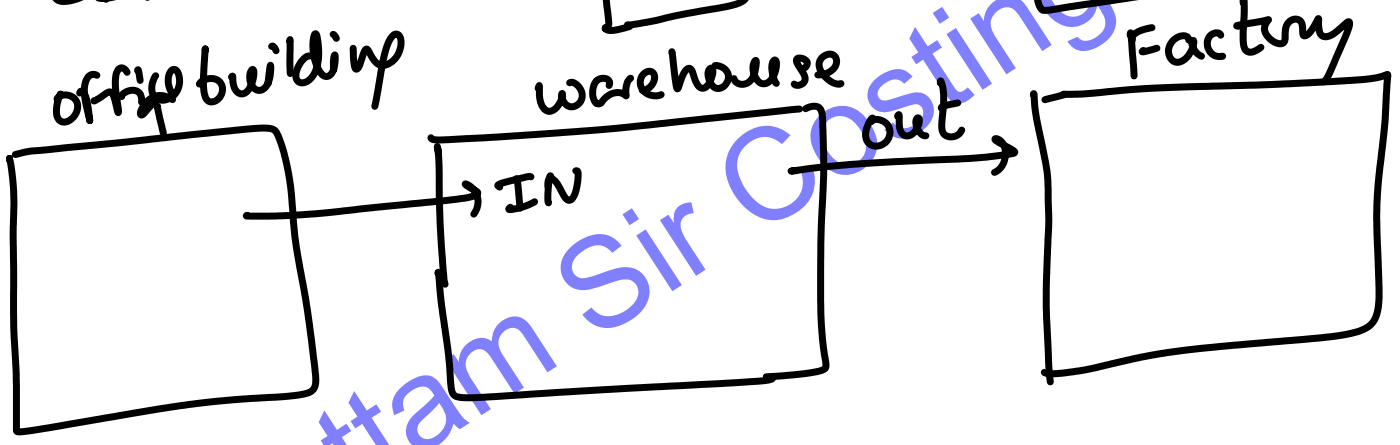
Material B = 5600 kg × (125 kg × 30% / 100 kg) = 2100 kg (mat. B)

Material C = 5600 kg × (125 kg × 20% / 100 kg) = 1400 kg (mat. C)

Calculation of material Variances when FIFO / LIFO method is used by Co. to calculate actual cost of material used

FIFO ⇒ FIRST IN FIRST OUT

LIFO ⇒ LAST IN FIRST OUT



Q.2 Calculations for material Variances

Particulars	SP × SQAO	SP × RSQ	SP × AU	AP × AQ
mat: A	Rs.4 × 750 kg = 3000	Rs.4 × 700 kg = 2800	Rs.4 × 650 kg = 2600	
		Rs.3 × 980	Rs.3 × 950	

	- 3000			
mat·B	Rs.3 × 1050 kg = 3150	Rs.3 × 980 kg = 2940	Rs.3 × 950 kg = 2850	
mat·C	Rs.2 × 1200 kg = 2400	Rs.2 × 1120 kg = 2240	Rs.2 × 1200 kg = 2400	
Total	8550 M_1	7980 M_2	7850 M_3	8295 (FIFO) 8430 (LIFO) M_4

DMCV =

DMUV =

DMPV

DMYV =

DMMV =

W.Note 1. Calculation of Actual Cost of material (AP × AQ) Consumed

Actual Qty Consumed (kg) = Opening stock (kg) + Purchase (kg) − closing stock (kg)

material A (AQ) = 200 kg + 800 kg − 350 kg = 650 kg

material B (AQ) = 150 kg + 1050 kg − 200 kg = 950 kg

material C (Adj) = 300 kg + 1100 kg - 200 kg = 1200 kg

Purchase price per kg for purchases made during the month = $\frac{\text{Total P. Cost}}{\text{Total P. Qty}}$

Actual price of material A = $\frac{\text{Rs. 3600}}{\text{800 kg}}$ = Rs 4.50 per kg

" " " " B = $\frac{\text{Rs. 3500}}{\text{1000 kg}}$ = Rs. 3.50 per kg

" " " " C = $\frac{\text{Rs. 1980}}{\text{1100 kg}}$ = Rs 1.80 per kg

Calculation of Actual Cost of material Used (Fifo method)

material A ⇒ 200 kg × Rs. 4 + 450 kg × Rs 4.50

⇒ Rs. 2825

material B ⇒ 150 kg × Rs. 3 + 800 kg × Rs 3.50

⇒ Rs. 3250

Material C ⇒ 300kg x Rs. 2 + 900kg x Rs 1.80

⇒ Rs. 2220

Total Cost of Ad Consumed (M4) → Fifo method

⇒ Rs. 8295

Calculation of Total Cost of Ad Consumed - LIFO Method

Material A ⇒ 650kg x Rs 4.50 = Rs. 2925

Material B ⇒ 950kg x Rs. 3.50 = Rs. 3325

Material C ⇒ 1100kg x Rs 1.80 + 100 kg x Rs. 2 =

Rs. 2180

Total Cost of Ad Consumed (M4) - Lifo method

⇒ Rs. 8430

W.Note.2 calculation of RSQ

we need to apportion Sum of actual Qty Consumed in std. Qty Ratio.

Sum of AQ Consumed = 650 kg + 950 kg + 1200 kg
= 2800 kg

Std. Qty Ratio = 25%, 35% & 40%

Material A (RSQ) = 2800 kg × 25% = 700 kg

Material B (RSQ) = 2800 kg × 35% = 980 kg

Material C (RSQ) = 2800 kg × 40% = 1120 kg

W.Note3 calculation of SQAo

As given in Question, Normal loss is 20% of input, It means

output is 80% of input

2400 kg = 80% of TOTal input

Total std. input = 3000 kg

std. Qty Ratio = 25%, 35% & 40%

Material A (SQAD) = 3000 kg × 25% = 750 kg

Material B (SQAD) = 3000 kg × 35% = 1050 kg

Material C (SQAD) = 3000 kg × 40% = 1200 kg

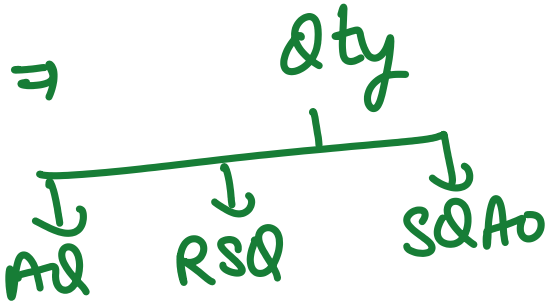
Statement showing DM variances

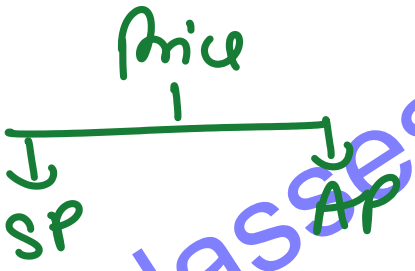
Particulars	Fifo (Rs.)	Lifo (Rs.)
DMCV = $M_1 - M_4$	255(F)	120(F)
DMUV = $M_1 - M_3$	700(F)	700(F)
DMPV = $M_3 - M_4$	445(A)	580(A)
DMYV = $M_1 - M_2$	570(F)	570(F)
DMMV = $M_2 - M_3$	130(F)	130(F)

Concept No·3 Direct Labour Variances

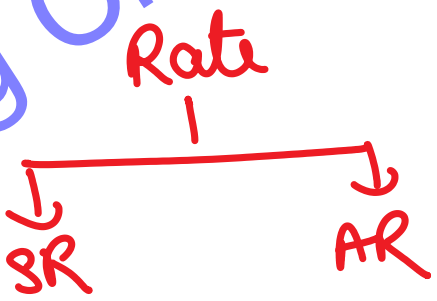
Total Labour Cost = Actual hours × Actual wage Rate

For Material ⇒





For Labour ⇒



Idle Time :→ when worker kept on sitting without working but has been paid.

Idle Time = Actual hours paid − Actual hours worked.

Here we are Taking into Consideration abnormal idle time.

case. 1 Labour Variance (without idle time)

i.e. it means when actual hours paid is equal to actual hours worked.

Lab Variance are of 5 types.

1). D.L. Cost Var.: This variance shall arise when Total std. Labour Cost & Total Actual Labour Cost is different.

Formula DLCV = SR x SHAO - AR x AH

SR = Std. Rate (wage Rate)

AR = Actual Rate (wage Rate)

AH = Actual hours

SHAO = Std. hours For Actual O/P

= Actual O/P x budgeted I/P For 1 unit of O/P

②. Direct Labour efficiency Variance [DLEV]

This Variance shall arise when

a). Labour do not work efficiently i.e Labour Take more time to produce same unit

b). Labour work more efficiently i.e. Labour Take less time to produce same unit

Formula :→ $SR \times SHAO - SR \times AH$

$= [SHAO - AH] \times SR$

③. Direct Labour Rate Variance :→

This Variance shall arise when std. rate & actual rate of wages is different.

wage Rate

Formula :→ SR × AH − AR × AH

= [SR − AR] × AH

④ & ⑤ Direct Labour yield & mix Variance

Above Variances (yield & mix) shall be calculated when more than 1 type of Labour is employed.

DL yield var :→ This variance shows actual performance of production mgr. This var. is also known by the name of sub-eff. var.

Formula :→ SR × SHAO − SR × RSH

= [SHAO − RSH] × SR

RSH ⇒ Revised std. hours

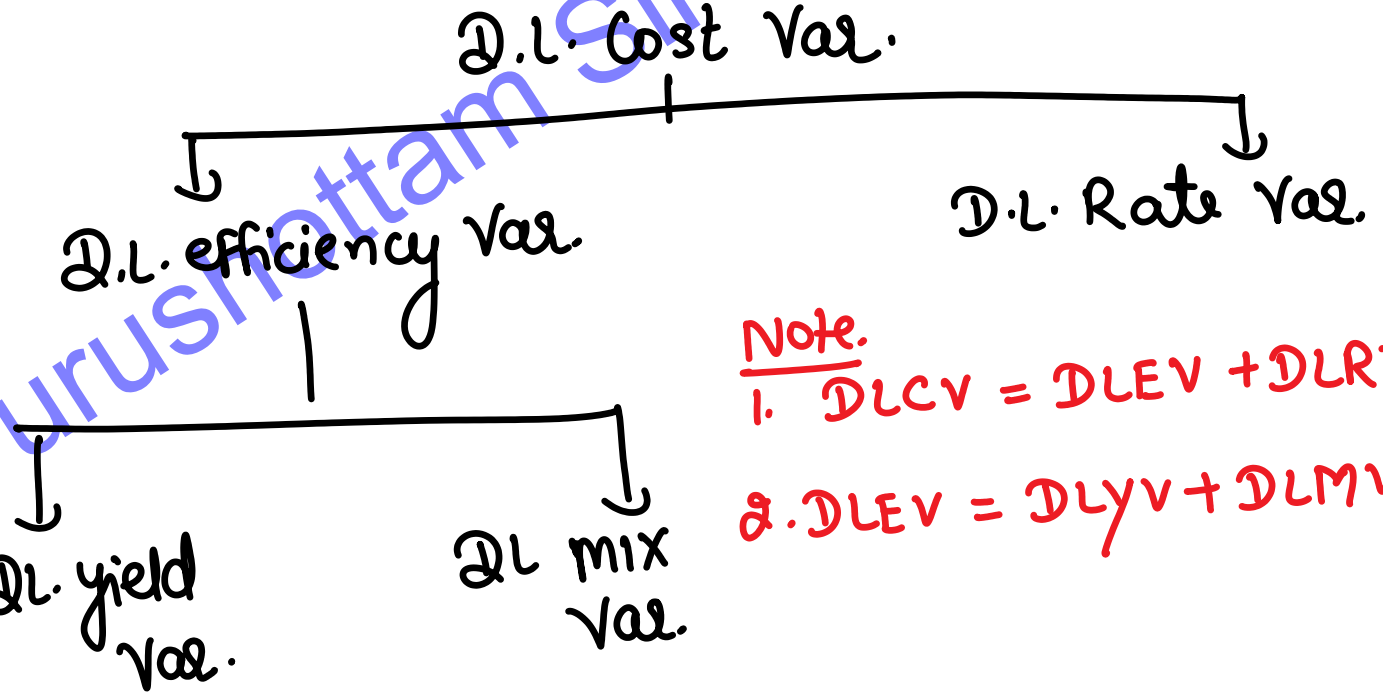
✓ ⇒ we will apportion 'Sum of all actual hours paid in std. Lab. mix

Ratio.

Direct Labour mix Var. :→ This variance is also known by the name of group Var. or gang Var.

Formula :→ $SR \times RSH - SR \times AH$

$= [RSH - AH] \times SR$

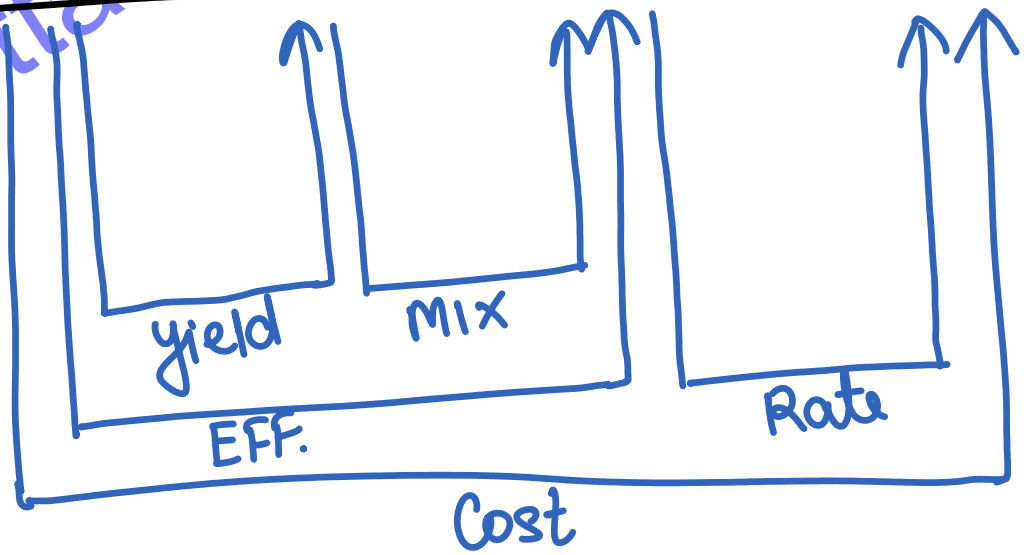


Note.

1. DLCV = DLEV + DLRV
2. DLEV = DLYV + DLMV

Box No 2 Calculating For Labour Var (without idle Time)

Particular	SR x SHAo	SR x RSH	SR x AH P	AR x AH P
Skilled	xx	xx	xx	xx
Semi Skilled	xx	xx	xx	xx
Unskilled	xx	xx	xx	xx
Total	xx	xx	xx	xx
	L_1	L_2	L_3	L_4



$DLCV = L_1 - L_4$

$DLYV = L_1 - L_2$

DLCV = $L_1 - L_4$

DLEV = $L_1 - L_3$

DLRV = $L_3 - L_4$

DLMV = $L_2 - L_3$

Case-2 Calculation of Labour variances (with Idle Time)

Idle Time = Actual hours paid - Actual hours worked

= AHP - AHW

↓

abnormal idle Time

In such case, idle time Variance shall be calculated.

This variance shall arise when actual hours worked is less than actual hours paid.

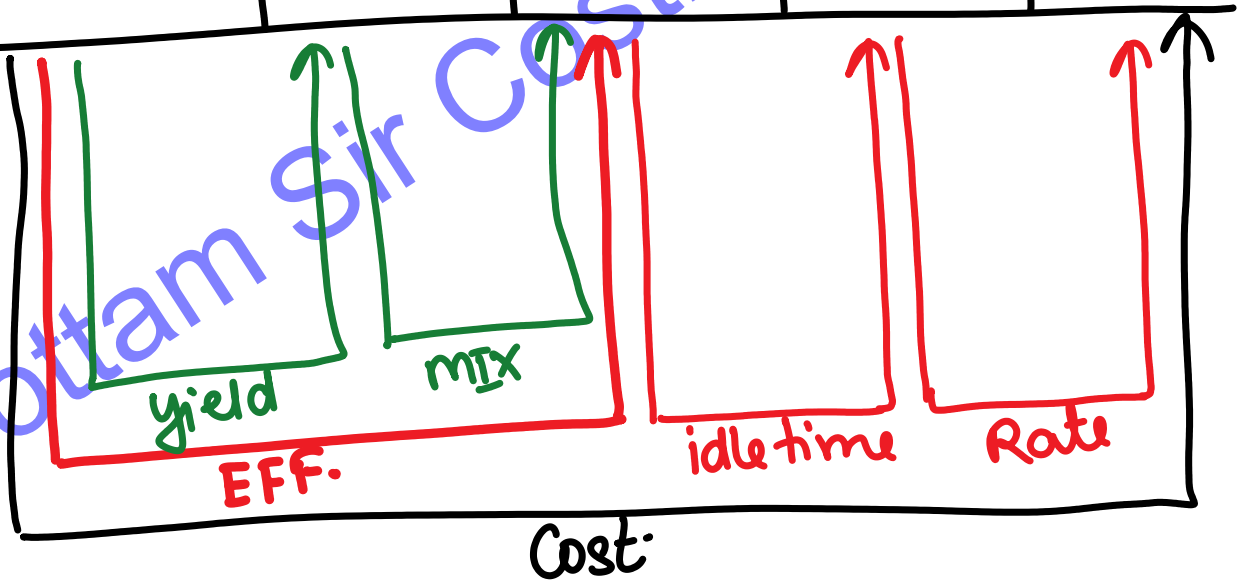
Formula :⇒ (AHW - AHP) x SR

This variance shall always be Adverse.

Box No-3 Calculations For Labour Variances (with idle time)

	SR x	SR x	SR x	SR x	AR x

Particulars	SR × SHAO	SR × RSH	AR × AHW	AR × AHP	AR × AHP
Skilled	XX	XX	XX	XX	XX
Semi-skilled	XX	XX	XX	XX	XX
Unskilled	XX	XX	XX	XX	XX
TOTAL	XX	XX	XX	XX	XX
	L_1	L_2	L_3	L_4	L_5



DLCV = $L_1 - L_5$

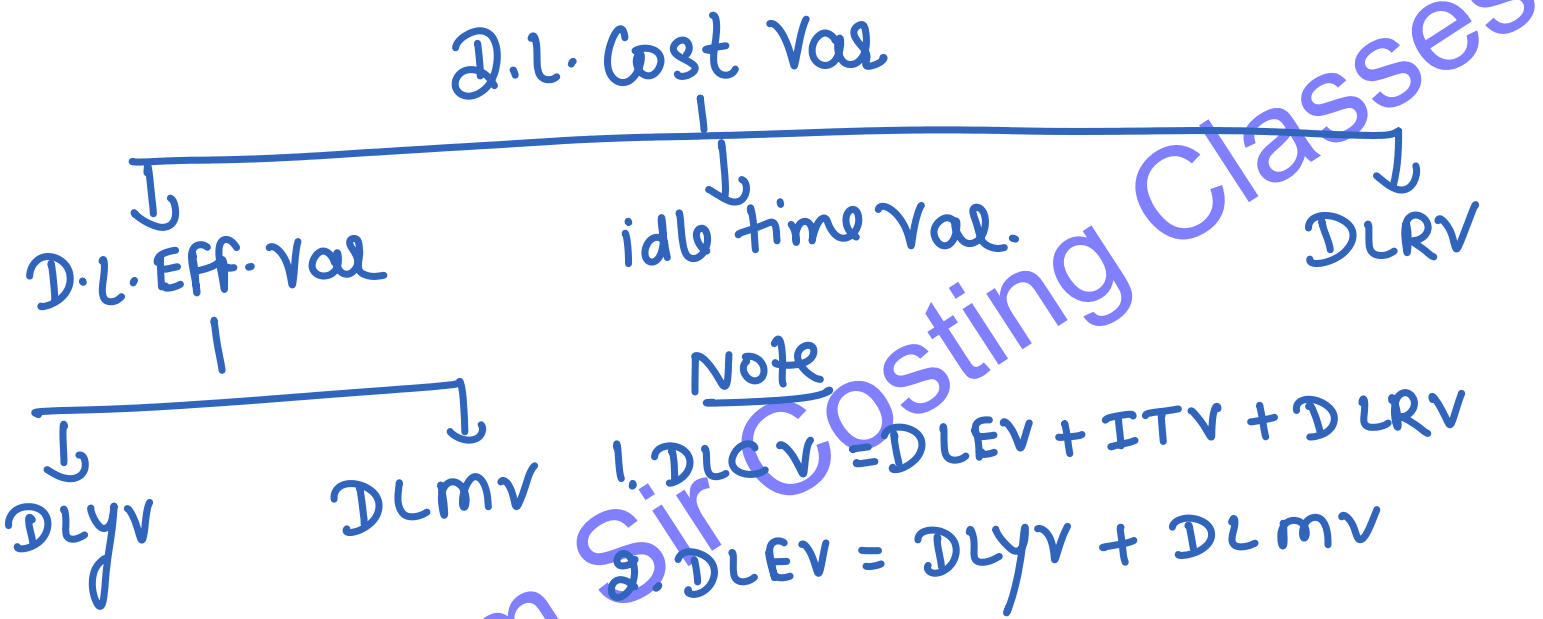
DLEV = $L_1 - L_3$

DL (Idle time) Var. = $L_3 - L_4$ (Always adverse)

DLRV = $L_4 - L_5$

DLyv = L1 - L2

DLmv = L2 - L3



Note

1. DLCV = DLEV + ITV + DLRV

2. DLEV = DLyv + DLmv

Q.4 case-2 calculations for Labour variances (with abnormal idle Time)

Particulars	SR × SHAD	SR × RSH	SR × AHW	SR × AHP	AR × AHP
skilled	Rs.45 × 3340 HR = 105300	Rs.45 × 2600 HR = 117000	Rs.45 × 1900 HR = 85500	Rs.45 × 2000 HR = 90000	Rs.50 × 2000 HR = 100000
Semi-skilled	Rs.30 × 720 HR = 21600	Rs.30 × 800 HR = 24000	Rs.30 × 1140 HR = 34200	Rs.30 × 1200 HR = 36000	Rs.35 × 1200 HR = 42000
unskilled	Rs.15 × 540 HR = 8100	Rs.15 × 600 HR = 9000	Rs.15 × 760 HR = 11400	Rs.15 × 800 HR = 12000	Rs.10 × 800 HR = 8000
TOTAL	135000 L_1	150000 L_2	131100 L_3	138000 L_4	150000 L_5

DLCV = $L_1 - L_5$ = 15000 (A) DLYV = $L_1 - L_2$ = 15000 (A)

DLEV = $L_1 - L_3$ = 3900 (F) DLMV = $L_2 - L_3$ = 18900 (F)

ITV = $L_3 - L_4$ = 6900 (A)

DLRV = $L_4 - L_5$ = 12000 (A)

W.Note.1 Calculation of AHP & AHW

AHW = AHP - Idle time

Particular	Actual hrs paid ₹	Idle time ₹	Actual hours worked
Skilled	50w x 40HR = 2000 HR	50w x 2 HR = 100 HR	2000 HR - 100HR = 1900 HR
Semi-Skilled	30w x 40HR = 1200 HR	30w x 2 HR = 60 HR	1140 HR
Unskilled	20w x 40HR = 800 HR	20w x 2HR = 40 HR	760 HR
Total	4000 HRS ✓	200 HR	3800 HR

W.Note.2 calculation of RSH

we need to apportion Sum of all Actual hrs

(paid) in std. Labour Mix Ratio =

Sum of all AHP = 4000 HR

Std. Lab. Mix Ratio = 65 : 20 : 15

Skilled (RSH) = $4000 \text{ HR} \times \frac{65}{65+20+15}$ = 2600 HR

Semi-Skilled (RSH) = $4000 \text{ HR} \times \frac{20}{100}$ = 800 HR

Unskilled (RSH) = $4000 \text{ HR} \times \frac{15}{100}$ = 600 HR

W.Note.3 calculation of SHAO

Std. HRs For Actual o/p = Actual o/p x budgeted input For 1 unit of o/p

$$\text{SHAO} = \text{A. o/p} \times \frac{\text{Total budgeted HRs}}{\text{Total budgeted o/p}}$$

Skilled (SHAO) = $1800 \text{ units} \times \frac{65\text{W} \times 40\text{HR}}{2000 \text{ units}}$

= 2340 hour

Semi-Skilled (SHAO) = $1800 \text{ units} \times \frac{20\text{W} \times 40\text{HR}}{2000 \text{ units}}$

$= 720 \text{ hour}$

$$\text{Unskilled (SHAD)} = 1800 \text{ units} \times \frac{15\text{W} \times 40\text{HR}}{2000 \text{ units}} = 540 \text{ HR}$$

Concept No. 4 overhead variance

- Overhead means indirect cost. indirect cost is sum of indirect material cost, indirect Labour cost & indirect Expenses.
- overhead cost is of 2 types
  1). Variable overhead
  2). fixed overhead

Best Example to understand all Technical words while calculating on Variance

Following data is provided for a month :→

Particulars	std./ budget	Actual
working days	25 days	26 days
Hours	30000 HR	33000 HR
output	24000 units	32500 units

Output	24000 units	32500 units
Overhead (Rs)	Rs. 45000	Rs 50000

Conclusions

1). budgeted days = 25 Actual days = 26

2). budgeted HRs = 30000 Hour Actual HRs = 33000 Hour

3). Budgeted o/p = 24000 units Actual o/p = 32500 units

4). Budgeted OH = Rs. 45000 Actual OH = Rs. 50000

5). budgeted OH p. unit = $\frac{\text{budgeted OH}}{\text{budgeted o/p}}$

$= \frac{\text{Rs. } 45000}{24000 \text{ units}} = \text{Rs. } 1.875 \text{ p. unit}$

Actual OH p. unit = $\frac{\text{Actual OH}}{\text{Actual o/p}}$

$= \frac{\text{Rs. } 50000}{32500 \text{ units}} = \text{Rs. } 1.538461 \text{ p. unit}$

6). budgeted OH per hour = $\frac{\text{budgeted OH}}{\text{budgeted HRs}}$

$= \frac{\text{Rs. } 45000}{30000 \text{ HRs}} = \text{Rs. } 1.50 \text{ per hour}$

Actual OH per hour = $\frac{\text{Actual OH}}{\text{Actual HRs}}$

$= \frac{\text{Rs. } 50000}{33000 \text{ HRs}} = \text{Rs. } 1.51515151 \text{ per hour}$

7). Std. HRs Fr Actual OIP → OIP → multiply

= Actual OIP × budgeted input for 1 unit of OIP

$= 32500 \text{ units} \times \frac{\text{Total budgeted IIP}}{\text{Total budgeted OIP}}$

$= 32500 \text{ units} \times \frac{30000 \text{ HRs}}{24000 \text{ units}}$

= 40625 HRs

8). ~~Expected O/P in Actual hrs~~

$$= \frac{\text{Actual hrs}}{\text{budgeted input For 1 unit of O/P}}$$ ✓

$$= \frac{330000 \text{ hrs}}{\text{budgeted I/P}} = \frac{330000 \text{ hrs}}{24000 \text{ units}}$$

budgeted o/p

= 26400 units

9). ~~Expected O/P in Actual days~~ (possible output)

$$= \frac{\text{Actual days}}{\text{budgeted I/P For 1 unit of O/P}}$$

$$= \frac{26 \text{ days}}{\text{budgeted I/P} / \text{budgeted O/P}} = \frac{26 \text{ days}}{25 \text{ days}/24000 \text{ units}}$$

= 24960 units

10) Expected HRs in Actual days (possible hours)

= Actual days × Std. HRs in 1 day

= 26 days × $\frac{\text{budgeted HRs (30000 HR)}}{\text{budgeted days (25 days)}}$

= 31200 HRs

Calculation of different amounts which will be used to calculate OH. Var

Particular	Formula 1	Formula 2
1. output absorbed overhead	= Actual o/p × budgeted OH p.u. = 32500 units × Rs. 1.875 p.u. = Rs. 60937.50	= Std. HRs for Actual o/p × budgeted OH p. hour = 40625 hour × Rs. 1.50 = Rs 60937.50
2. Input:	= Actual HRs ×	= Expected o/p in

2. Input = absorbed overhead	= Actual HRS x budgeted OH per hour = 33000 hour x Rs. 1.50 = Rs. 49500	= Expected o/p in actual HRs x budgeted OH p.u. = 26400 units x Rs 1.875 = Rs. 49500
3. possible overhead	= possible o/p x budgeted OH p. unit = 24960 units x Rs 1.875 = Rs. 46800	= Possible HRs x budgeted OH per hour = 31200 HRs x Rs 1.50 = Rs. 46800
4. budgeted OH [Normally given in question]	= budgeted o/p x budgeted OH per unit = 24000 units x Rs 1.875 = Rs. 45000	= budgeted HRs x budgeted OH per hour = 30000 HRs x 1.50 per hour = Rs. 45000
5. Actual	= Actual o/p x actual OH per	= Actual HRs x actual OH per hour

Actual OH [Normally given in question]	× actual OH per unit = 32500 units × Rs. 1·538461 = Rs 50000	× actual … per hour = 3000 hours × Rs. 1·5151 = Rs. 5000

Both formulas to calculate all the amounts are based on output and Time.

Overhead Variances are divided in 2 parts

1). Variable overhead variances

2). Fixed overhead Variances

Variable overhead variances :→ Calculation of VOH Var. are studied in 2 parts.

1). VOH Var. (without abnormal idle Time)

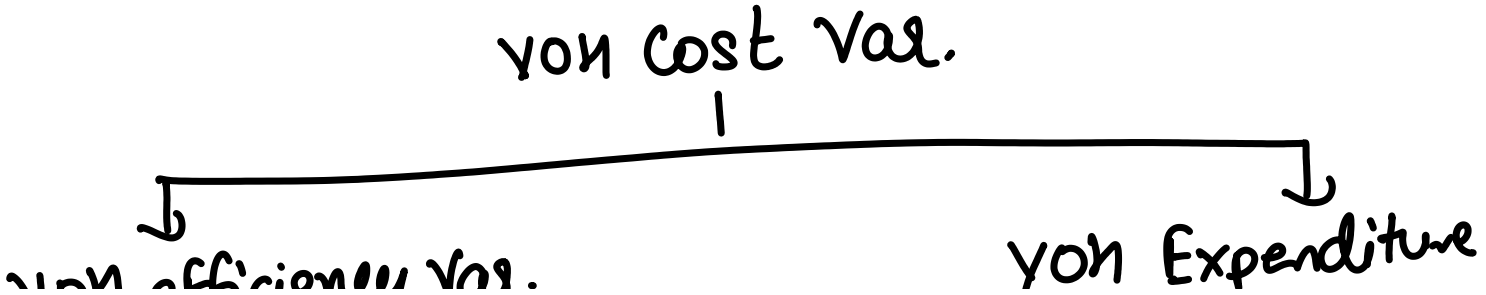
2). VOH Var. (with abnormal idle Time)

abnormal idle time is a situation where actual hours worked is less than actual hours paid.

Abnormal Idle Time = AHP − AHW

case.1 Calculation of VOH without idle Time

In such case, VOH Var. are of 3 types



VOH efficiency Var. ↓ VOH Expenditure Var. ↓

Note: VOH Cost Var = VOH eff. Var + VOH Exp. Var.

1). VOH Cost Var. :→ This Variance shall arise when budgeted OH p.u. & actual OH p.u is different.

Formula :→ output based

[output based ✓]

⇒ Actual O/P × budgeted OH p.u. (←) Actual O/P × Actual OH p.u.

⇒ [budgeted OH p.u. − Actual OH p.u.] × Actual O/P

② VOH efficiency Var. :→ This Variance shall arise when VOH incurring facilities are used more or less efficiently.

Formula ⇒ Actual O/P × budgeted VOH − Expected output in ... × VOH ... unit

formula

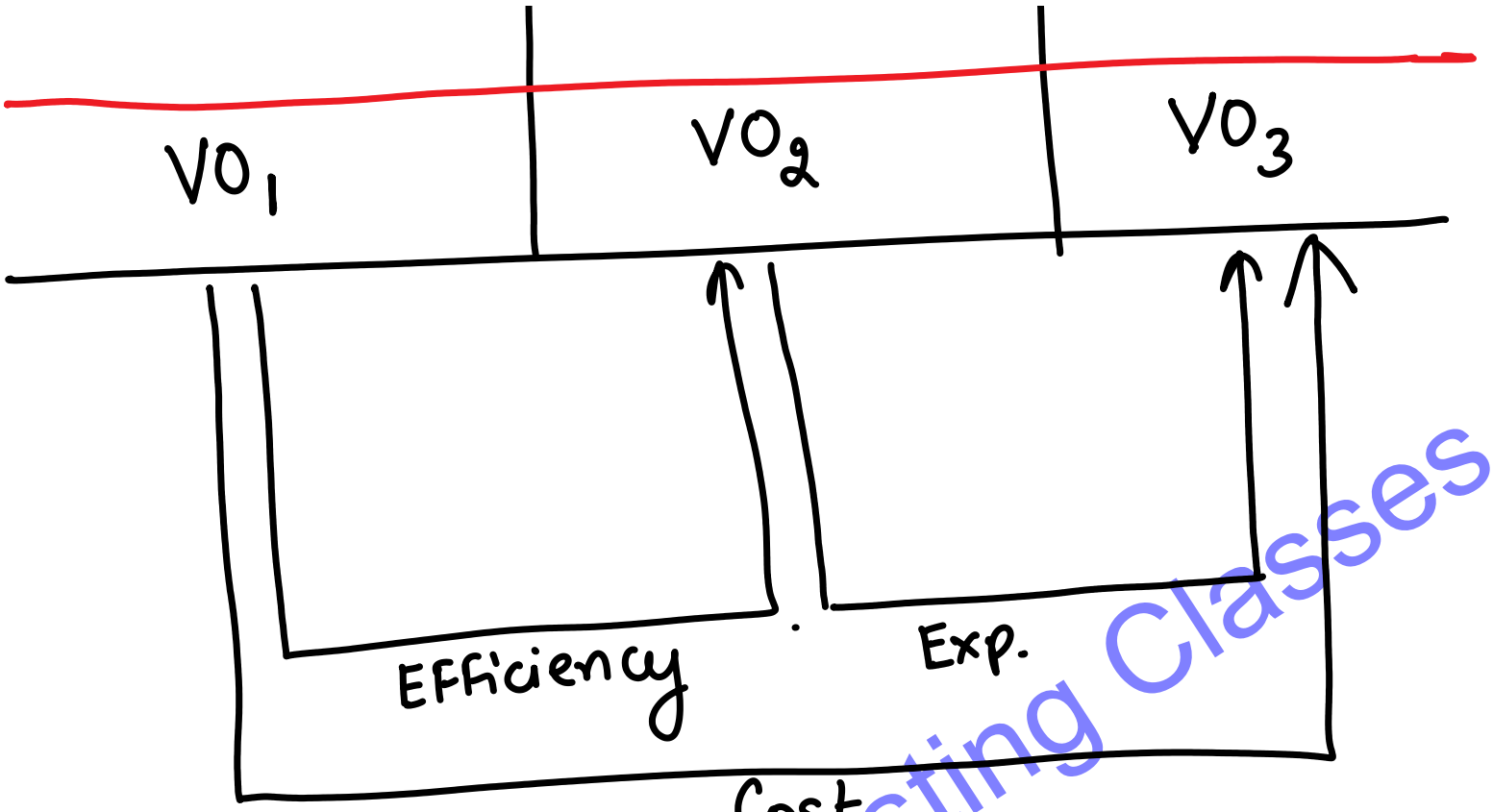
$$\Rightarrow \left[\begin{array}{l}\text{Actual o/p per unit} - \text{Expected o/p in actual hrs.}\end{array}\right] \times \begin{array}{l}\text{Actual Hrs} \\ \text{p.unit}\end{array} \begin{array}{l}\text{budgeted} \\ \text{VOH} \\ \text{p.unit}\end{array}$$

3) VOH Expenditure Variance :→ This Variance shall arise when std. Rate & actual rate of VOH is different.

Formula :→ $\left[\begin{array}{l}\text{budgeted VOH per hour} - \text{Actual VOH p.HR}\end{array}\right] \times$ Actual Hrs.

Box No. 4 Calculations For VOH (without abnormal idle Time)

Output-absorbed VOH	Input-absorbed VOH	Actual VOH
F1 & F2	F1 & F2	F1 & F2



VOH Cost Var. = $VO_1 - VO_3$

VOH Eff. Var. = $VO_1 - VO_2$

VOH Exp. Var. = $VO_2 - VO_3$

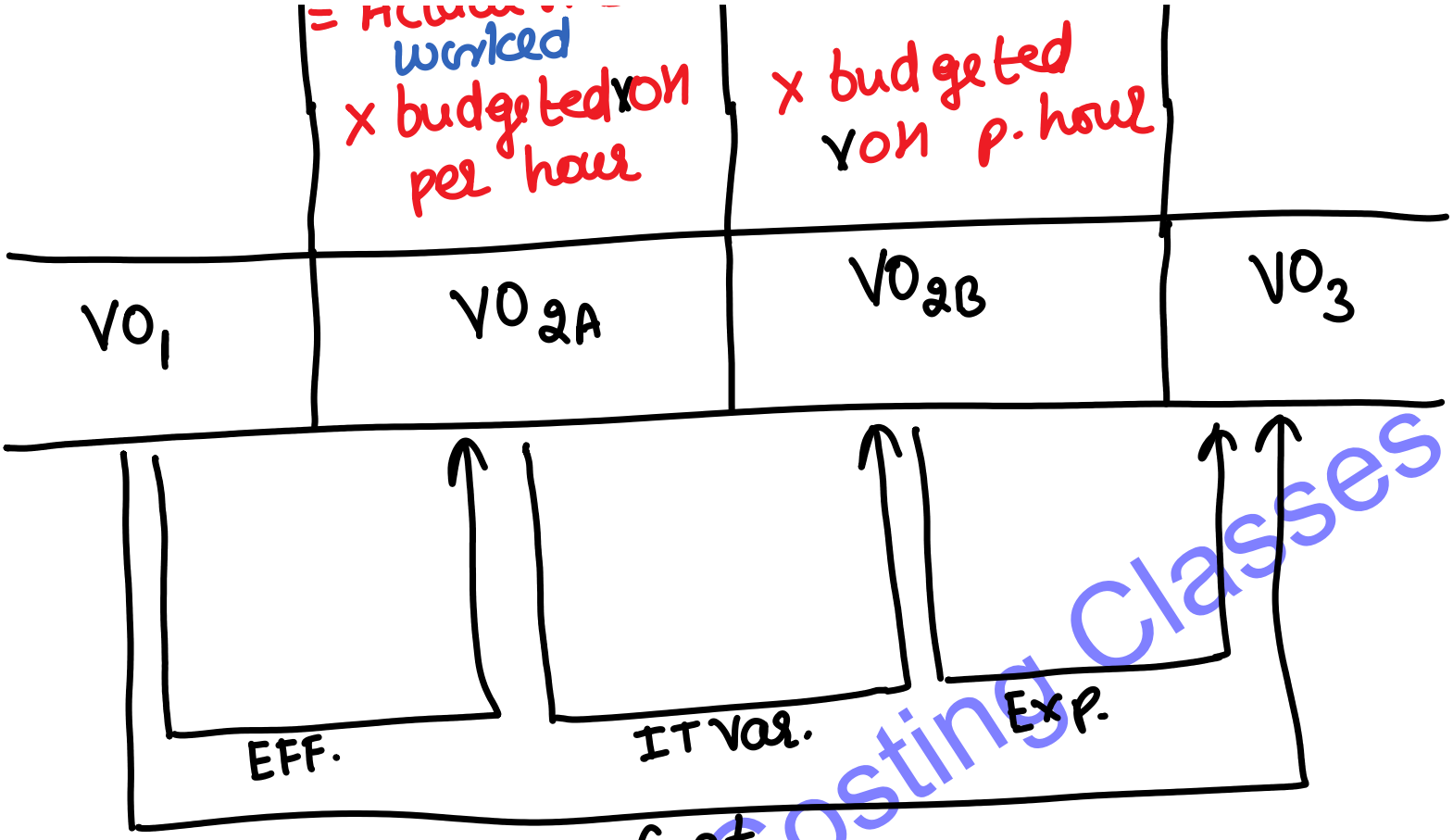
Case-2 Variable overhead Var. (with abnormal idle Time)

Variable overhead idle time Var. :→

This Variance shall arise when actual HRs paid to Labour is more than actual HRs worked.

Box No-5 Variable overhead Var. (with abnormal idle time)

Output absorbed VOH	Input absorbed VOH ✓ [AHW based]	Input absorbed VOH ✓ [AHP based]	Actual VOH
F1/F2	Formula-1 = Actual HRs worked	Formula-1 = Actual HRs Paid x budgeted	F1/F2



VOH Cost Var = $VO_1 - VO_3$

VOH Eff. Var = $VO_1 - VO_{2A}$

VOH idle Time Var. = $VO_{2A} - VO_{2B}$

VOH Exp. Var = $VO_{2B} - VO_3$

Q.5 VOH Variances (without idle time)

Output-absorbed VOH	Input-absorbed VOH	Actual VOH
Formula 1 = Actual o/p × budgeted VOH p.u. = 3800 units × Rs 3 = Rs 11400 [VO_1]	Not Required [VO_2]	Rs. 12000 [VO_3]

W.N.1 Calculation of budgeted VOH p.u.

$$= \frac{\text{budgeted VOH}}{\text{budgeted units}} = \frac{\text{Rs. } 12000}{4000 \text{ units}}$$

= Rs 3 per unit

Variable overhead Cost Var. = $VO_1 - VO_3$

= 11400 − 12000 = Rs 600 (A)

Fixed Overhead Variances

we will study FOH Var. in 3 cases as follows :→

case.1 FOH Var. without calender var and without idle time ✓

case.2 FOH Var. without calender var and with idle time ✓

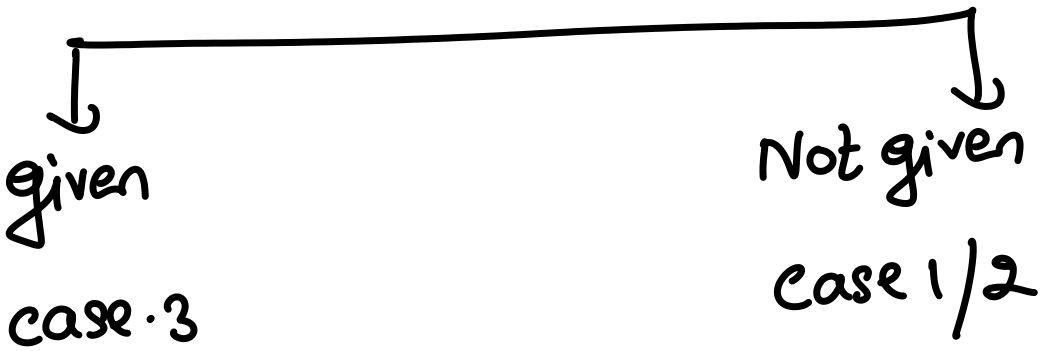
case 3 FOH Var. with calender Var.

Note 1 when information about budgeted days & actual days is given in question, It means question is indirectly asking calender Var. This will be covered in case.3.

Actual days & budgeted days

↓

info



case·1 FOH Var. without calndr Var & without idle time

FOH Cost Var.

- FOH volume Var
  - FOH eff. Var
  - FOH cap. Var.
- Fo Exp. Var (budget Var.)

Note 1. FOH Cost Var. = FOH volume Var. + FOH Exp. Var.

2. FOH volume Var. = FOH eff. Var + FOH capacity Var.

① FOH Cost Var. ∴ → This variance shall arise when budgeted FOH p.u. and

Actual FOH p.u is different

Formula = [budgeted FOH p.u − Actual FOH p.u.] × Actual output

(2). FOH Volume Var. :→ This Variance shall arise when Actual OIP & budgeted output is different.

Formula :→ [Actual OIP − budgeted OIP] × budgeted FOH p.u.

(3) FOH Expenditure Var. :→ This Var. shall arise when budgeted FOH & Actual FOH is different.

Formula = TOTAL budgeted FOH − TOTAL Actual FOH

(4). FOH efficiency Var. :→ This Var. shall arise when workers work more or

less efficiently & Fixed overhead is related to efficiency of worker.

Formula :→ [Actual OIP − Expected OIP in actual HRS.] × budgeted FOH p.u.

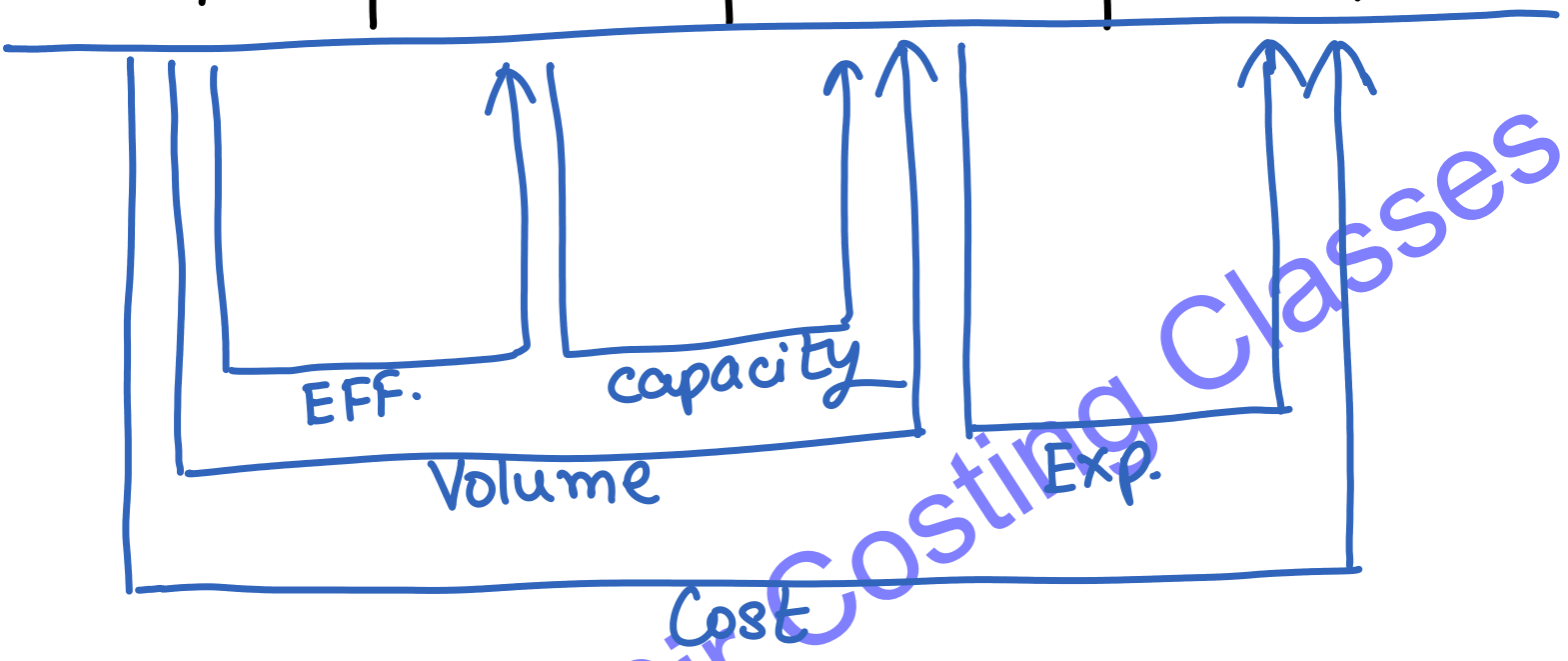
⑤ FOH capacity Var. :→ This Variance shall arise when there is under utilisation / over-utilisation of capacity.

Formula :→ [Actual HRs − possible HRs] × budgeted FOH per hour

Box No-6 FOH Var. without calender Var & without idle time

Output absorbed FOH	Input absorbed FOH	Budgeted FOH	Actual FOH
F1/F2	F1/F2	F1/F2	F1/F2

F1/F2	F1/F2	F1/F2	F1/F2
FO_1	FO_2	FO_3	FO_4



FOH Cost Var. = $FO_1 - FO_4$

FOH volume Var. = $FO_1 - FO_3$

FOH Exp. Var. = $FO_3 - FO_4$

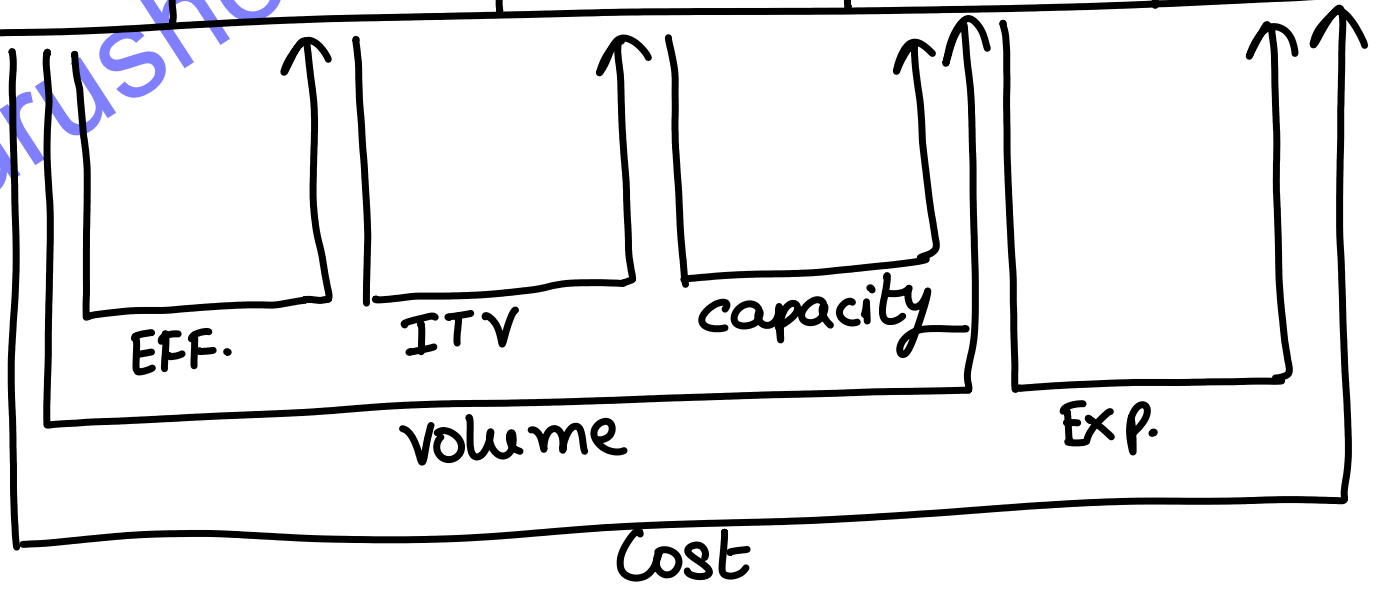
FOH Eff. Var. = $FO_1 - FO_2$

FOH capacity Var. = $FO_2 - FO_3$

Case-2 FOH Var. without calender Var. and with abnormal idle time

Box No. 7

Output absorbed FOH	Input absorbed FOH (AHW Based)	Input absorbed FOH (AHP based)	Budgeted FOH	Actual FOH
F1/F2	Formula 1 = Actual HRS worked x budgeted FOH p. HR	Formula 1 = Actual HRS paid x budgeted FOH p. hour	F1/F2	F1/F2
FO_1	FO_{2A}	FO_{2B}	FO_3	FO_4



FOH Cost Var. = $FO_1 - FO_4$

FOH volume Var. = $FO_1 - FO_3$

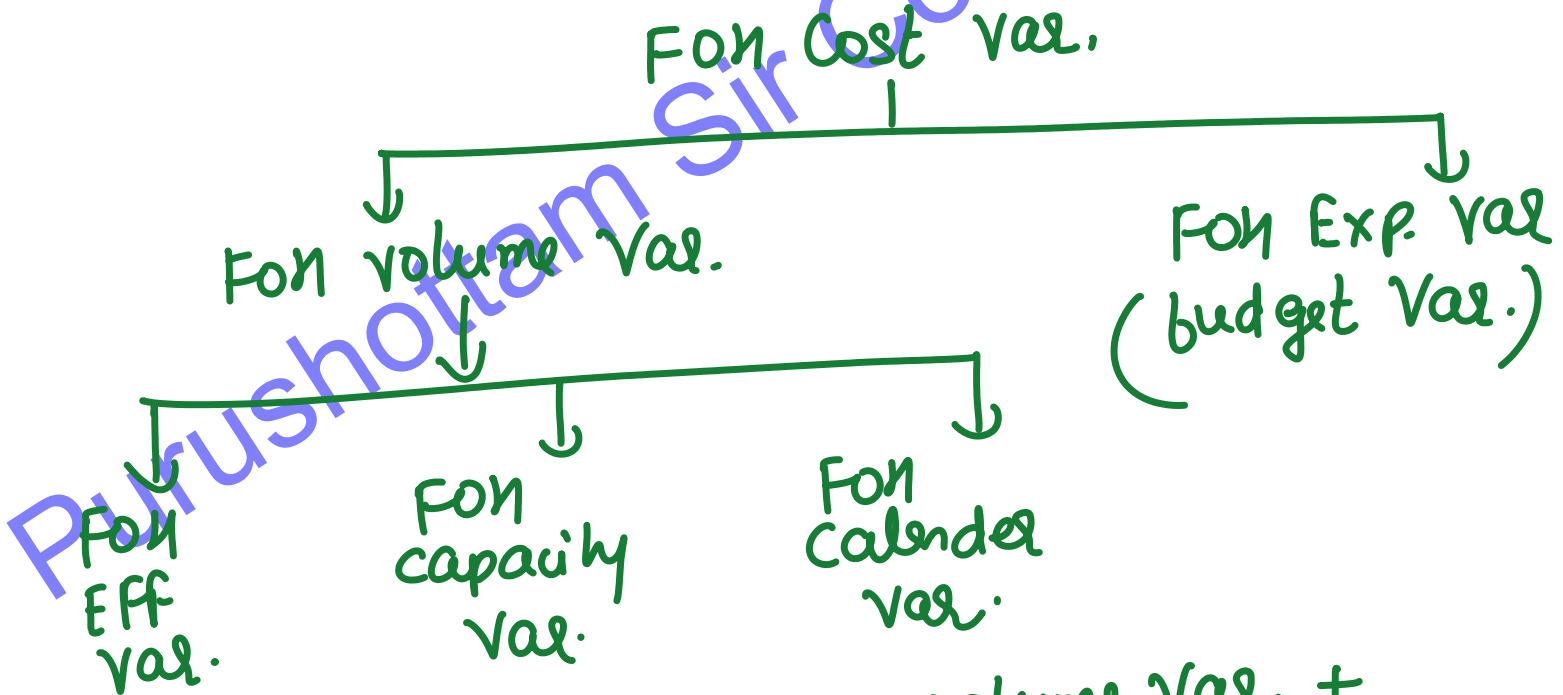
FOH Exp. Var. = $FO_3 - FO_4$

FOH Eff. Var = $FO_1 - FO_{2A}$

FOH idle time var = $FO_{2A} - FO_{2B}$

FOH capacity Var. = $FO_{2B} - FO_3$

Case 3 FOH Var. with calender var.



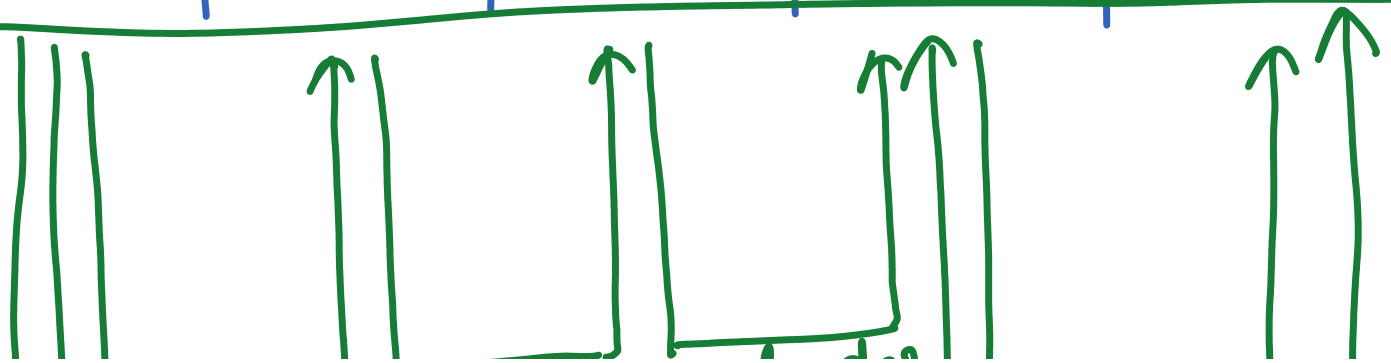
Note 1 FOH Cost Var = FOH volume Var. + FOH Exp. Var

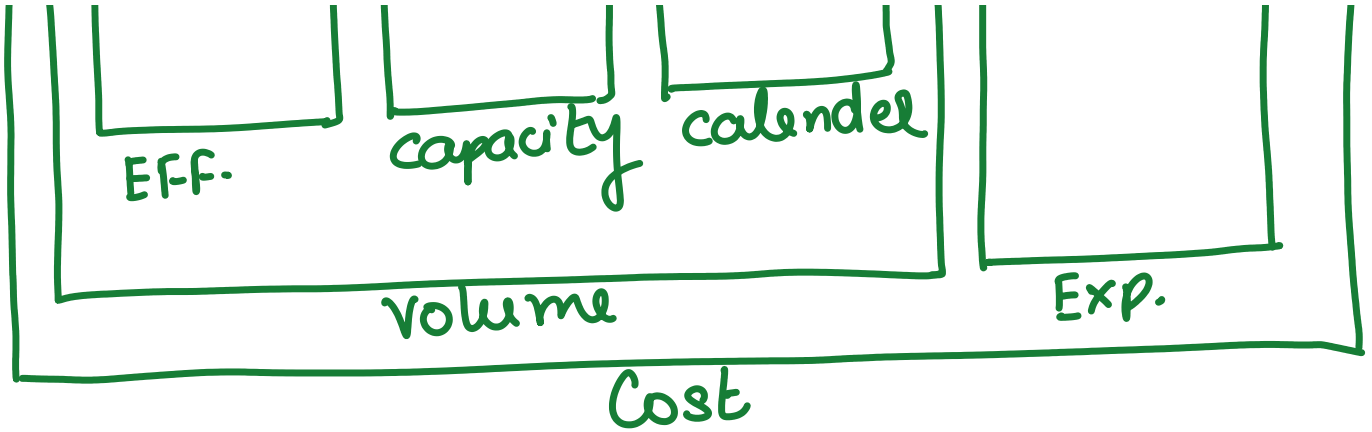
FOH volume Var = FOH eff. Var. + FOH Cap. Var. + FOH calender Var.

FOH calender var : → This variance shall arise when possible working hours & budgeted working hours are different.

BOX No. 8

Output absorbed FOH	Input absorbed FOH	possible FOH	Budgeted FOH	Actual FOH
F_1/F_2	F_1/F_2	F_1/F_2	F_1/F_2	F_1/F_2
FO_1	FO_2	FO_3	FO_4	FO_5





(1) FOH Cost Var. = $FO_1 - FO_5$

(2) FOH volume Var. = $FO_1 - FO_4$

(3) FOH Exp. Var. = $FO_4 - FO_5$

(4) FOH Eff. Var. = $FO_1 - FO_2$

(5) FOH capacity Var. = $FO_2 - FO_3$

(6) FOH calender Var. = $FO_3 - FO_4$