



STANDARD COSTING

OBJECTIVES

After studying this chapter, you should be able to :	Practical Question
* Understand the meaning of standard cost and variances.	----
* Compute variances related to material, labour, overhead, sales and profit.	Q. 1. to Q. 15.
* Understand the reporting pattern which may be adopted for control and decision making purposes.	Q. 16.

THEORY SECTION

(A) Brief Introduction :

In corporate sector, there is a separation of ownership from management. The owners do not manage the business and the managers are not the owners. Even in non-corporate sector, with gigantic business affairs, it is almost impossible for the owners to manage the business themselves. Accordingly, owners are compelled to delegate authority to the managers. Since the managers have no proprietary interest in the business, it is quite possible that they may tend to be inefficient and a bit careless and because of this, the sales may come down, cost and rejection may increase resulting thereby in substantial loss of profit.

For this reason, the owners feel, and rightly so, that the performance of various managers should be subjected to some degree of stringent control. There is a need to follow carrot and stick approach.

Control always presupposes some yardstick or standard. Accordingly, well before the period commences, detailed standards are laid down for various managers. These standards clearly show what is expected of the concerned managers. For example, in respect of sales, we lay down for sales manager, the types of products to be sold, the quantity of each of them to be sold and the price to be charged. At the end of the relevant period the actual results are compared with the expected ones (the standards) and the difference, known as **VARIANCE**, is analysed to throw light on the precise factors responsible for the variation. As far as the examination is concerned, this is the end. In real life, further investigation is undertaken, if the variance amount is very significant and corrective actions are taken so as to prevent adverse past from repeating itself in future.

We apply Standard Costing technique to six areas in all.

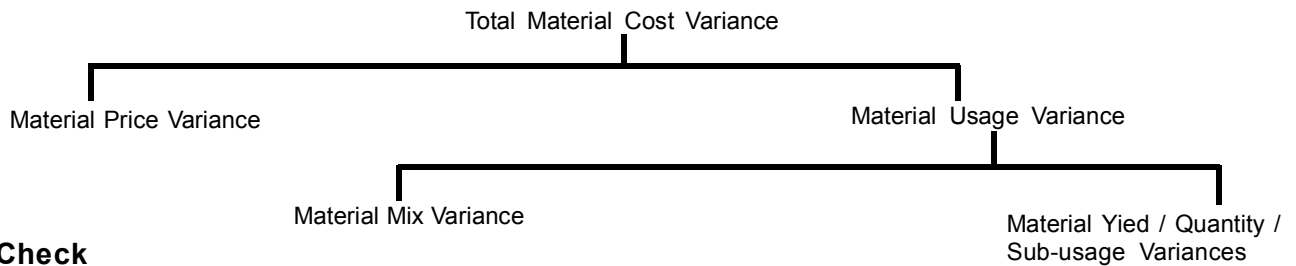
They are as follows :

1. Material Cost
2. Labour Cost
3. Variable Overheads
4. Fixed Overheads
5. Sales
6. Profit

(B) EXPLANATION OF THE METHOD FOLLOWED IN THE SOLUTIONS :

1. MATERIAL COST VARIANCES :

The following is the chart of the material cost variances



Check

Total Material Cost Variance = Material Price Variance + Material usage Variance

Material Usage Variance = Material Mix Variance + Material Yield Variance

Detailed Explanation :

(i) Setting the standards :

As we saw, the actual results are to be compared with the Standards and for this purpose, we must have comparable Standards.

The material cost is a variable cost item and the amount of cost that one incurs entirely depends on the quantity of output. Thus, if the standard material cost per unit is ₹ 5, and if the actual output is 100 units, then, the standard cost is ₹ 500. **In other words in the case of material cost, the standards are always for the actual output.** If the production manager has produced, say, 1000 units, then we should find out the cost that he should have incurred for 1000 units and this cost should be compared with the actual cost to get the variance.

EXAMPLE :

Standards for 1 unit of product X :

Material	Quantity	Price per Kg.	Total Cost (₹)
A	5 Kgs.	2	10
B	10 Kgs	3	30
	<u>15 Kgs.</u>		<u>40</u>

The production manager has produced 1000 units and incurred the cost as shown below.

Material	Quantity	Price per Kg.	Total Cost (₹)
A	4800 Kgs.	2.5	12,000
B	10600 Kgs.	2.9	30,740
	<u>15,400</u>		<u>42,740</u>

Very obviously, the given standards which are for the output level of 1 unit (₹ 40) can't be compared with the actual for 1000 units (₹ 42,740). The given standards are to be revised to make them represent actual output level, so that they become comparable.

This process of revising the standards is extremely simple. Since the cost is variable in nature, the quantity figures and therefore the total cost figures are just to be revised proportionately. For example, 1 unit of X needs 5 Kgs. of Material A and therefore 1000 units should need 5000 Kgs. of material A. The revised standard are shown below.

Material	Quantity	Price per Kg.	Total Cost (₹)
A	5000	2	10,000
B	10,000	3	30,000
	<u>15,000</u>		<u>40,000</u>

In order to solve the problem, one should first pick up the information about the output level represented by the given Standards. One should, then pick up the actual output figure. If these two are same, then they are comparable and one should proceed further to calculate the variances. If they are not same, then given the Standards are to be proportionately revised to make them represent actual output level. **Thus, whether the given Standards need to be revised or not depends on whether the output levels are same or not.**

(ii) Calculation of Variances :

Total Material Cost Variance :

This variance shows the total loss or gain because of change in the total material cost. The variance is the difference between the total Standard material cost (obviously for actual output) and the total actual material cost.

Thus Material Cost Variance is :

$$\text{Total Std. Material Cost} - \text{Total Actual Material Cost}$$

Material Price Variance : (see also notes on Single / Partial Plans)

This variance accounts for that part of the total material cost variance which comes into being because of change in the material purchase price. Here, our aim is to know the total gain or loss because of change in the material purchase price.

The loss / gain per unit purchased and consumed can be calculated by simply comparing standard purchase price with the actual purchase price. However, we want to know the total gain or loss. The total loss / gain depends on the actual quantity purchased and consumed.

Thus the price variance is :

$$\text{Actual Quantity X (Standard Price - Actual Price)}$$

Material Usage Variance :

This variance accounts for that part of the total material cost variance which comes into being because of change in the consumption of raw material. Here, our aim is to know the total gain/loss because of the difference between material quantity consumed and the material quantity that should have been consumed.

Obviously, therefore, we have to compare the standard material quantity with the actual material quantity, the difference being the quantity of material lost or gained. In order to quantify this loss in money terms, we need to multiply this difference by the price of raw material.

We have two prices: Standard Price and the Actual Price.

Which price should be used?

We have to use standard price for this. This is based on the following reasons.

It is possible that there is some difference between the standard price and the actual price. However, it is the job of the price variance to take care of that difference and once that is taken care of, we are left with standard price alone. The difference between the two prices always gets transferred to profit & loss account.

In the organisation, there is division of labour. For change in the price, purchase manager is answerable whereas for change in the consumption of raw material, production manager is accountable. Now, if we multiply the quantity difference by the actual price, then the efficiency or otherwise of the purchase manager would affect the variance for the production manager. The price, therefore, has to remain constant and only Standard price remains constant.

The standards are developed well before the period commences and we let our production manager know the quantity of raw material that he should consume and in case the actual consumption is more (or less) then we also let him know the rate at which the penalty, or reward, will be calculated. That means the price has to be known to the production manager well before the budget period commences. Obviously only the standard price can be known in advance.

Thus the usage Variance is :

Standard material price X (standard raw material quantity-actual raw material quantity)

Material Mix Variance and Material Yield Variance

These two variances, put together account for the total material usage variance. If the raw material consumed is not same as standard, then, that could be because of two reasons in all. Either the mix of the input may change and/or the absolute quantity of material may change. Consider the following example :

Material	Standard Quantity	Actual Quantity		
		(1)	(2)	(3)
X	50 Kgs.	40	55	55
Y	50 Kgs.	60	55	60
Total	100 Kgs.	100	110	115

As can be seen, in the first case, though the total input quantity is same as the standard, 10Kgs. of Y have replaced 10Kgs. of X. Thus, total quantity remaining same, the mix of input has changed. In the second case, though the mix of input items (1:1) has remained the same as the standard mix, the absolute quantity has gone up by 10Kgs. Thus, mix remaining constant, this time the actual quantity has changed. In the third case, the mix and the absolute quantity, both, have changed. In other words, change in the mix and / or change in the quantity account for total material usage variance. For the purpose of calculation of these variances, each of them is to be calculated by keeping the other of them constant. Thus, when we speak about the mix variance, we presume that the quantity consumed is quite upto the mark and when we take-up yield variance, we presume that the mix is quite upto the mark.

Material Mix Variance :

Here our aim is to know whether the actual input of raw materials is as per standard or has changed. For this, we pick up the figure of total actual input and we apply the standard mix ratio to it and we get the mix that ought to be, given the actual input. We compare this standard mix with the actual mix and multiply the difference by the standard material price. Thus material mix variance is :

$$\text{Std. Material Price} \times (\text{Std. Material Mix Quantity for Actual Input} - \text{Actual Mix Quantity})$$

Material Yield Variance :

This variance accounts for that part of the usage variance that comes into being because of change in the quantity of raw material consumed, the mix remaining constant. There are four methods for the calculation of this variance, as shown below :

1. Based on Input :

We just compare the total standard input quantity with the total actual input quantity and we multiply the difference by the standard average cost. The standard average cost is the total standard cost divided by the total standard input quantity.

Thus Material Yield Variance is :

$$\text{Std. Weighted Average Cost P.U. of Input} \times (\text{Total Std. Input} - \text{Total Actual Input})$$

2. Based on process loss.

Based on the actual input quantity, we find out the Standard process loss and we compare that with the actual process loss. The difference is output lost / gained because of excess / less rejection. We multiply this difference by the Standard average cost per unit of output.

$$\text{Std. Average Cost P.U. of Output} \times (\text{Std. Loss for Actual Input} - \text{Actual Loss})$$

3. Based on yield / output :

Based on the actual input quantity, we find out the Standard output and we compare that with the actual output. The difference is the output lost / gained. We multiply this difference by the Standard average cost per unit of output.

$$\text{Std. Average Cost P.U. of Output} \times (\text{Std. Output for Actual Input} - \text{Actual Output})$$

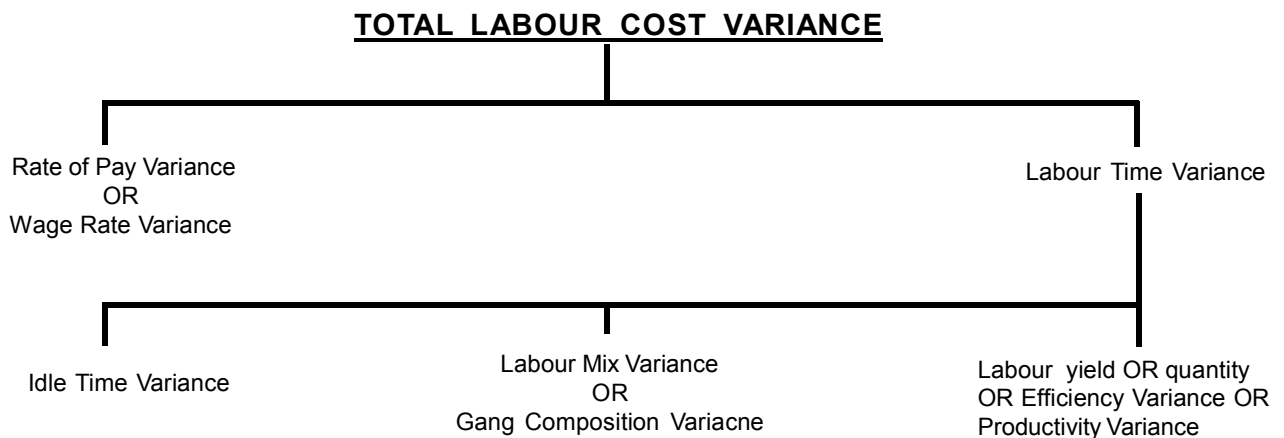
4. Based on mix :

This time we compare the Standard mix of standard input with the Standard mix based on actual input (developed for the purpose of mix variance) and we multiply the difference by the Standard price of relevant material item.

$$\text{Std. Material Price} \times (\text{Std. Mix for Std. Input} - \text{Std. Mix for Actual Input})$$

2. LABOUR COST VARIANCE :

The following is the chart of the labour cost variances :



Check :

$$\text{Total Labour Cost Variance} = \text{Rate of Pay Variance} + \text{Labour Time Variance}$$

$$\text{Labour Time Variance} = \text{Idle Time Variance} + \text{Mix Variance} + \text{Efficiency Variance}$$

Detailed Explanation**(i) Setting the Standard :**

Like Material cost, even this cost is also a variable cost item and therefore, like material cost, here also the Standards are to be for actual output. This means if the given Standards for labour cost do not represent actual output level, then, they must be proportionately revised to make them represent actual output level.

(ii) Calculation of variances :

The variance chart here almost resembles material variance chart with minor changes. In most of the cases the cost changes from material to labour and the variances are same. Accordingly, the explanations provided in respect of material cost variances is equally applicable to labour cost variances and therefore these details are not repeated.

Total Labour Cost Variance :

This variance is the difference between the total Standard labour Cost (for actual output) and total actual labour cost.

Thus Labour Cost Variance is :

$$\text{Total Std. Labour Cost} - \text{Total Actual Labour Cost}$$

Rate of Pay Variance :

This is just like material price variance. The Variance is actual number of hours paid for multiplied by the wage rate difference.

In other words, it is :

$$\text{Actual Hours} \times (\text{Standard Rate} - \text{Actual Rate})$$

Labour Time Variance :

This is just like material usage variance. The variance is Standard wage rate multiplied by the difference between Standard hours and actual hours paid for.

Thus Labour Time Variance is :

$$(\text{Std. Hours} - \text{Actual Hours}) \times \text{Standard Rate}$$

Idle time Variance : This is abnormal idle hours for various categories multiplied by applicable standard wage rates. If there are two or more categories, then category wise break-up of idle time would, normally, be given. If not given, we must put presumption to get the break up. Preferably, the presumption should be that idle hours were in standard ratio.

Thus Idle Time Variance is :

$$\text{Idle Time} \times \text{Standard Rate}$$

Labour Mix Variance :

This is just like material mix variance. Thus, we apply the Standard mix ratio to the actual input of hours worked and we get Standard mix for actual total hours. **If there is idle time, it should be deducted from the gross input hours and the Standard ratio should be applied to the actual or productive hours paid for.** This is because, out of gross hours, Idle time variance accounts for idle hours. Therefore, we now have to account for net hours worked.

Thus Labour Mix Variance is :

$$[\text{Std. Mix for Actual Net Hours} - \text{Actual Mix (Net)}] \times \text{Std. Rate Per Hour}$$

Labour Efficiency Variance :

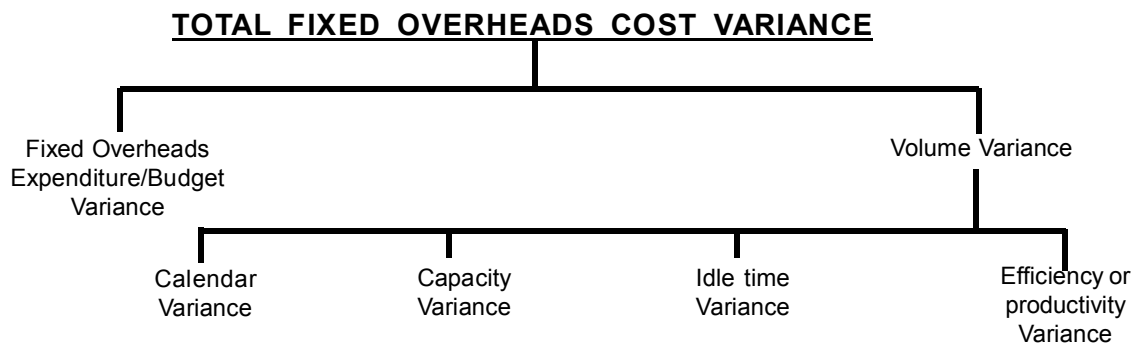
This is just like material yield variance based on input. We compare total standard hours with the total actual (but net i.e. excluding idle time) input hours and we multiply the difference by Standard average rate per hour (Total Standard Cost , Standard input hours)

Thus Labour Efficiency Variance is :

(Total Std. Hours - Total Actual Net Hours) x Std. Weighted Average per hour

3. FIXED FACTORY OVERHEADS VARIANCES : (BASED ON ABSORPTION COSTING) :

The following is the chart of the fixed factory overheads cost variances under absorption costing:



Check :

Total Cost Variance = Expenditure Variance + Volume Variance

Volume Variance = Calendar Variance + Capacity Variance + Idle item Variance + Efficiency Variance.

Detailed Explanation :

(i) Setting the Standards :

Unlike the Raw Material Cost, this cost does not depend on the output. Rather, it depends on the period because it is a period cost. Obviously, therefore, the standards or, say budgets, are always for a period. Very soon we shall see that for calculating variances, we sometimes compare days, hours, expenditure and output figures for the given period and therefore we should know budgets as regards these items.

(ii) Basic explanation about fixed overheads variances :

For setting the selling price of a product, we generally add profit margin to the total cost. The total cost is the sum total of variable cost and fixed cost. Variable cost per unit is reasonably simple to get because it depends on the output. However, the fixed cost has nothing to do with the output, and the total cost remains constant irrespective of the quantity of the product that we produce. Then, how do we get the fixed cost per unit?

For this, we have a system of recovering the overheads. Well before the budget period commences, we make an estimate as regards fixed overheads to be incurred and the quantity of the product to be produced. Though there is no nexus between the cost and the output, after all the output that we are going to have, must bear the charge of overheads cost that we are going to incur. Thus, we lay down nexus between the two and divide the budgeted overheads by the expected output and we get overheads per unit.

Once, we get the Fixed Overheads rate per unit, every time we produce a unit we charge the overheads at this predetermined rate. If everything goes as per our expectation, then, we notice at the end of the period that overhead amount charged to the output is exactly equal to the overheads cost incurred and thus, there is no variance. In other words, **the overheads cost variance comes into being if the overheads charged or, say, recovered are not same as overheads incurred.**

(iii) Calculation of variances :

Fixed Overheads Cost Variances :

This variance comes into being if there is some difference between overheads recovered (obviously, on the basis of actual output) and overheads cost incurred. Thus, this variance is under or over-absorption of overheads.

Consider the following example :

	Budget	Actuals			
		A	B	C	D
Fixed Overheads	₹ 1,00,000	1,00,000	90,000	1,10,000	96,000
Output (units)	25,000	24,000	25,000	24,000	24,000
Absorption rate per unit	<u>₹ 4</u>				

In situation A, the amount recovered is ₹ 96,000 (24,000 X 4) whereas amount spent is 1,00,000. The amount spent is more which means there is under-recovery of overheads and the variance comes into being. Here, whereas Fixed overheads, have remained constant, the output has changed. In situation B, the amount recovered is ₹ 1,00,000 whereas amount spent is ₹ 90,000. There is over-recovery of overheads and the variance comes into being. Here, whereas output has remained the same, the overheads have changed.

In situation C, the amount recovered is ₹ 96,000 whereas the amount spent is ₹ 1,10,000. Again, there is under recovery of overheads. This time overheads and output, both, have changed but **not proportionately**.

In situation D, though overheads and output, both, have changed, there is still no variance because the amount spent (₹ 96,000) and the amount recovered (24,000 X 4) are same. This should suggest that the total overheads cost variance comes into being, if either only overheads change, output remaining constant, or only output changes, overheads remaining constant, or both of them change, but not in the due proportion. Under-absorption implies that the actual fixed overheads cost per unit is more than the standard cost whereas over-absorption implies that the actual fixed overheads cost per unit is less than the standard cost. Absence of under / over absorption implies that the actual fixed overheads cost, per unit is same as standard cost. Accordingly, under-absorption is an adverse variance whereas over absorption is a favourable variance. In other words, if output and overheads, both remain constant or both of them change but just in due proportion, then, there is no overheads cost variance at all.

To conclude, one should compare the amount of overheads recovered with the amount of overheads spent and the difference is the variance. Over-recovery signifies the favourable variance whereas under recovery signifies the adverse variance.

Thus Fixed Overheads Cost Variance is :

$$\text{Fixed Overheads Absorbed} - \text{Actual Fixed Overheads}$$

Fixed Overheads Expenditure Variance :

Just compare budgeted overheads with the actual amount spent and the difference is the variance.

$$\text{Thus Fixed Overheads Expenditure Variance} = \text{Budgeted Fixed Overheads} - \text{Actual Fixed Overheads}$$

Fixed Overheads Volume Variance :

We just compare the volume or the output figures and the difference is to be multiplied by the recovery rate per unit. If the actual output is more than the budgeted output, the variance is favourable (because higher output reduces the overheads cost per unit) and if the actual output is less, the variance is adverse.

Thus Fixed Overheads Volume Variance is :

$$(\text{Budgeted Output} - \text{Actual Output}) \times \text{Absorption Rate P.U.}$$

The analysis of volume variance is required to know the precise factors responsible for change in the output. The output depends on so many factors like number of working days, number of hours in working days, unproductive (idle) time and efficiency level.

Consider the following budget:

No. of days	250
Hours per day	500
Hours per unit	5
∴ Total Hours p.a.	1,25,000
∴ Total output p.a.	25,000

Calendar Variance

Now if, instead of working for 250 days, the workers work for 251 days, then, other factors remaining constant, hours would increase by 500 and the output would increase by 100. The variance that comes into being because of change in number of days is called **calendar Variance**. We should compare the number of days as per budget with actual number of days and the difference should be multiplied by the recovery rate per day. If the actual number of days is more, then, the variance is favourable because the more the days, the more the hours and the more the output.

Thus Calendar Variance is :

$$(\text{Budgeted Days} - \text{Actual Days}) \times \text{Absorption Rate Per Day}$$

Capacity Variance

Now, days remaining constant, if the workers work for more or less than 500 hours per day, then, again the output would change. The variance that comes into being because of change in such capacity utilization is known as **capacity Variance**. We find out the number of hours that should have been paid for in actual number of days and we compare this with the actual number of hours paid for. The difference is multiplied by the recovery rate per hour. If the actual number of hours is more, then, the resultant variance is favourable because the more the hours, the more the output.

$$\text{Capacity Variance} = (\text{Std. hours for Actual Days} - \text{Actual Hours}) \text{ Absorption Rate per Hour}$$

Sometimes in the problem, the student is not given information about number of days. In such cases, the calendar variance cannot be calculated. Even the capacity variance, in the manner shown above, cannot be calculated. In such cases, we compare budgeted hours with actual hours paid for. The difference is to be multiplied by the recovery rate per hour. This comparison takes care of calendar and capacity both. Therefore, if the information about days is not given, then, we calculate this variance and call it capacity variance. If the information about days is given, then we calculate calendar variance and capacity variance in a normal way but we use this variance (direct comparison of hour) as crosscheck. This variance has to be equal to calendar variance plus capacity variance.

If No. of Days are not given

Capacity Variance = Budgeted hours - Actual hours) Absorption per hour Rate

Capacity Variance by Alternate Method = Calendar Variance + Capacity Variance by Normal Method

The idle time variance is calculated by multiplying idle hours by recovery rate per hour.

Idle Time Variance = Idle Time x Absorption Rate per hour

The Efficiency Variance can be calculated in one of the two possible ways, as shown below:

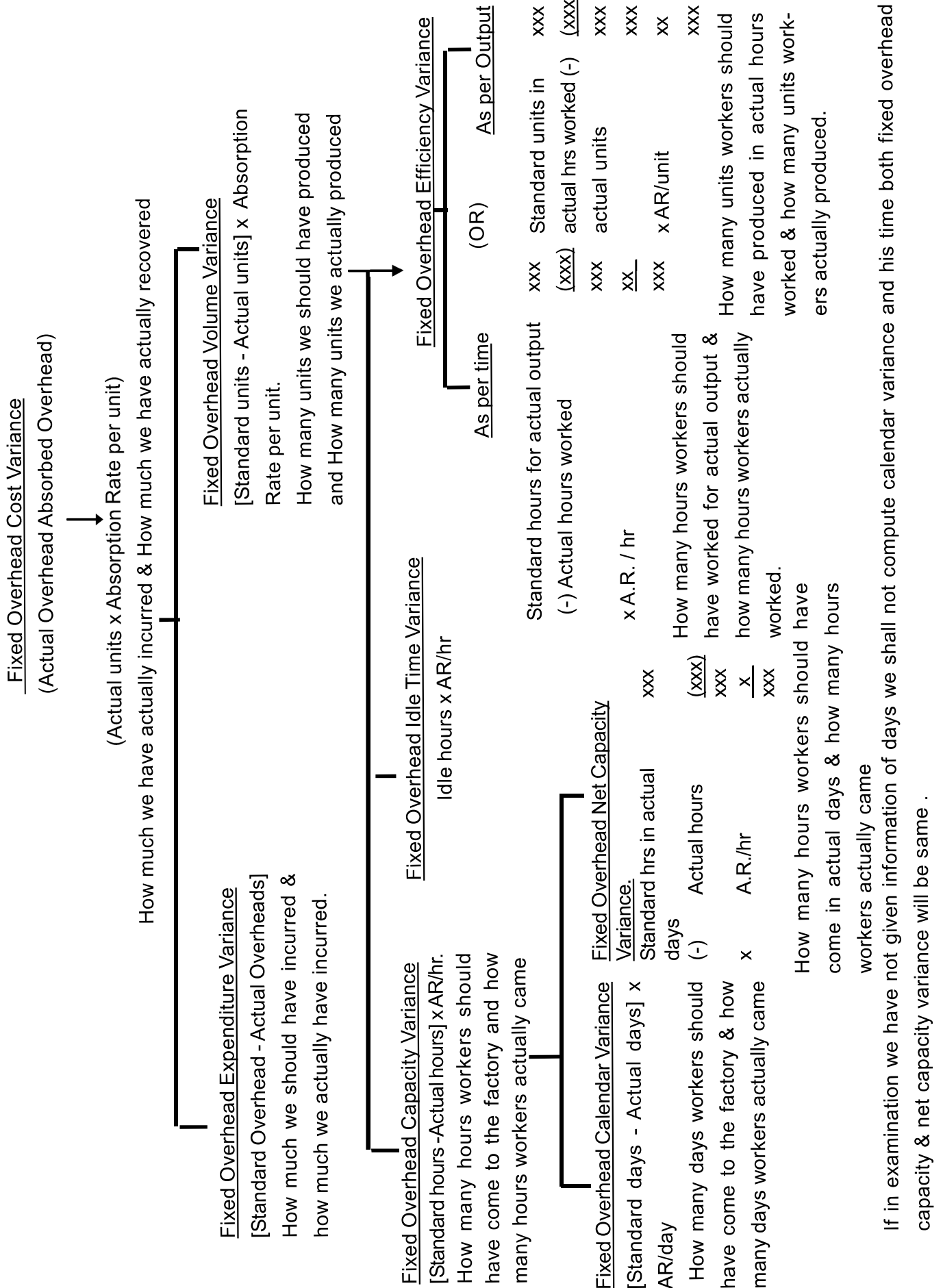
- i) We find out the number of units that should have been produced in actual number of hours (**net, excluding idle time**). We compare this with the actual output and the difference is to be multiplied by the recovery rate per unit.

Efficiency Variance = [(Std. output in Actual Net hours - Actual output)] x Absorption rate p.u.

OR

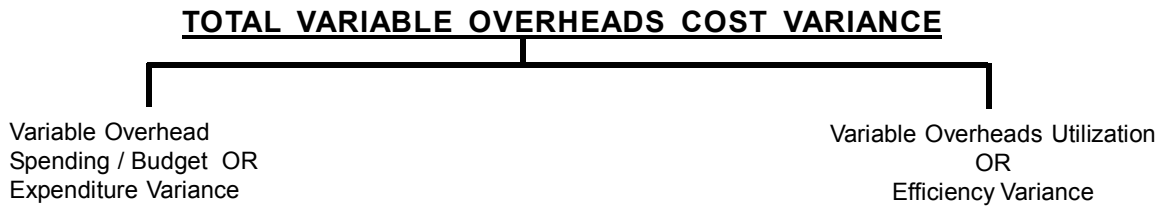
- ii) We find out the number of hours that should have been taken for the actual production and we compare this with actual number of hours (**net, excluding idle time**) taken. The difference is to be multiplied by the recovery rate per hour.

Efficiency Variance = (Std. hours for Actual Output - Actual Net hours) Absorption rate per hour



4. VARIABLE FACTORY OVERHEADS VARIANCES :

The following is the chart showing variable factory overheads variances.



Check :

Total Variable Overheads Cost Variance = Spending Variance + Utilization Variance

Detailed Explanation :

i) Setting the Standards :

This cost, being variable in nature, depends on the actual output and therefore, like material cost and labour cost, the Standards are always for actual output.

ii) Calculation of Variances :

Total Variable Overheads Cost Variance :

This is the difference between total Standard Variable Cost and total actual variable cost.

$$\text{Variable Overheads Cost Variance} = \text{Total Standard Cost} - \text{Total Actual Cost}$$

Variable Overheads Spending Variance :

This is just like labour rate of pay variance. Thus, we multiply the rate difference by the actual labour hours paid for.

$$\text{Variable Overheads Spending Variance} = (\text{Standard Rate} - \text{Actual Rate}) \text{ Actual hours}$$

Variable Overheads Utilization Variance :

This is just like labour time variance. Thus, we multiply the labour hours difference by the standard variable overheads rate per hour.

$$\text{Variable Overheads Utilisation Variance} = (\text{Standard Hours} - \text{Actual Hours}) \text{ Standard Rate}$$

Here, the actual no. of hours to be used should be gross no. of hours if the variable overheads cost is incurred during the idle time. if it is not incurred during the idle time, then, we should use net no. of hours.

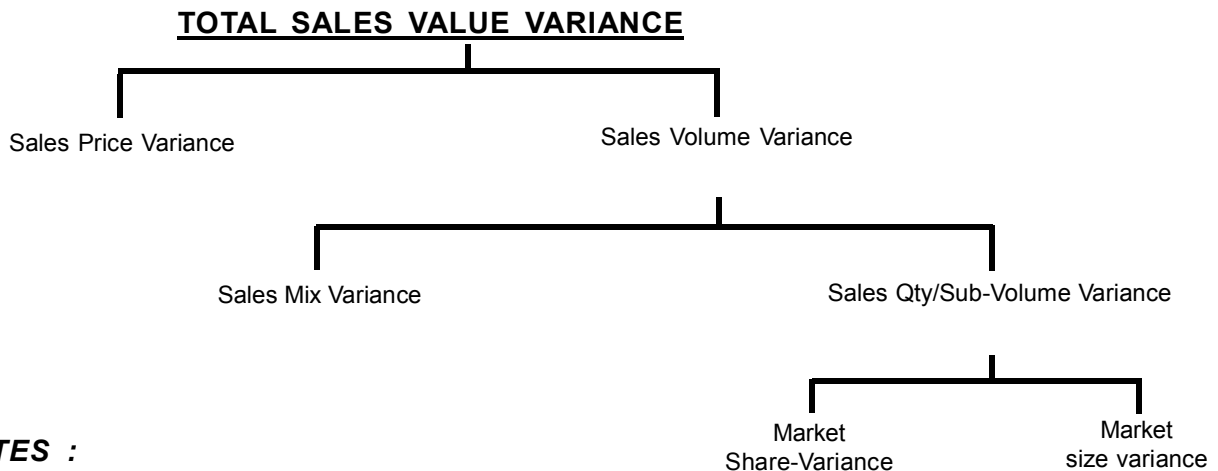
Note :

Though the analysis of Variable Overheads Cost Variance, as explained above is possible, normally people calculate only the total variable overheads cost variance. The other variances are not calculated normally. There are some obvious reasons for this. The Spending Variance is rarely controllable. (Example: Increase in the electricity rate) The Utilization variance comes into being if workers take more or less time and this factor is looked into when we calculate labour time variance. There is no point, in real life situation, in repeating the investigation. Thus, once workers take more time, variable overheads utilization also increases. Therefore, the people are not interested in analysing the total variable overheads cost variance.

It may also be noted that labour hours are common for labour cost variances and variable overheads cost variance.

5) SALES VARIANCES :

The chart is as shown below :



NOTES :

1) **Budget for Comparison :** The sales targets are always for a period. The budget to be compared with the actual result has to be for the same period for which the actual results are given. Thus, whenever the budget is for the same period for which the actual results are given, the given budget itself is comparable with the actual and no revision is required. On the other hand, if the budget is not for the same period for which the actual results are given, the given budget has to be revised to make it represent the same period for which the actual results are given. Since we are talking about revenue and not the expenses, it is obvious that if actual quantity or price is more than the budget, then it gives us favourable variance.

2) **Total sales value variance :** This is the difference between the budgeted sales and the actual sales.

$$\text{Total Sales Value Variance} = \text{Total Budgeted Sales} - \text{Total Actual Sales}$$

3) **Sales Price variance :** This is just like material price variance and we get it by multiplying the sales price difference by actual quantity sold.

$$\text{Sales Price Variance} = (\text{Standard Sales Price} - \text{Actual Sales Price}) \times \text{Actual Sales Quantity}$$

4) **Volume Variance :** This is just like material usage variance and we get it by multiplying the sales quantity difference of each product by standard selling price.

$$\text{Sales Volume Variance} = (\text{Budgeted Sales Qty.} - \text{Actual Sales Qty.}) \times \text{Standard Sales Price}$$

5) **Sales Mix Variance :** This is very usual mix variance. Accordingly, we apply standard ratio to the actual total quantity sold and we develop standard sales mix.

We compare this with the actual sales mix and the difference is to be multiplied by standard selling price of each product.

$$\text{Sales Mix Variance} = (\text{Standard Sales Mix for Actual Total Sales Qty.} - \text{Actual Sales mix}) \times \text{Std. S.P.}$$

6) **Sales Qty./Sub-Volume Variance :** This is just like material yield variance based on input and we get it by multiplying the total sales quantity difference by the standard average selling price per unit.

$$\text{Sales Qty. Variance} = (\text{Total Std. Sales Qty.} - \text{Total Actual Sales Qty.}) \times \text{Std. Weighted Avg. Sales Price p.u.}$$

7) **Market Share Variance** : This is the change in total sales quantity due to change in market share. We multiply the actual market size by standard market share percentage to get standard sales quantity figure. We compare this with actual sales quantity and multiply the difference by standard average sales price per unit.

Market Share Variance = Change in Sales Qty. due to change in Mkt. Share x Std. Weighted Avg. S.P.P.U.

8) **Market Size Variance** : This is the change in total Sales quantity due to change in market size, multiplied by standard average sales per unit. We multiply the market size difference by standard market share percentage to get the change in total sales quantity.

Market Size Variance = Change in Sales Qty. due to Change in Mkt. Size x Std. Weighted Avg. S.P.P.U.

PROFIT VARIANCES

The Chart is as shown on the last page of notes on this chapter.

NOTES :

1) Like Sales, the profit targets are also for the period and whenever the given budget is not for the same period for which the actuals are given, the given budget has to be revised. Also, the actual profit being more would be a favorable variance.

2) **Total Profit Variance** :

This is the difference between total budgeted profit and actual profit.

(A) **Profit Variance due to change in Sales** :

This part of the chart is very similar to sales value variance chart. The only difference being the sales quantity difference is to be multiplied by standard sales price in sales value chart whereas the same quantity difference is to be multiplied by standard profit per unit in this part of the chart. The quantity variances in the two charts would be different only because of the difference between standard sales price and standard profit. The sales price variance in both charts is the same.

(i) **Profit Variance due to change in S.P.**

This is usual price variance which we get by multiplying actual sales quantity by the sales price difference.

(ii) **Profit Variance due to change in sales volume** :

We get this variance by multiplying the sales quantity difference of **each product** by the standard profit per unit.

(iii) **Profit Variance due to change in Sales Mix** :

This is usual mix variance and we get it by multiplying standard profit by the mix difference.

(iv) **Profit Variance due to change in Sales Qty.**

This is usual quantity variance and we get it by multiplying the **total sales quantity** difference by standard average profit per unit.

(a) / (b) : These Variances are same as those in the sales chart, the only difference being, we multiply the quantity difference by standard average **net profit** per unit.

(B) **Profit Variance due to change in Cost** :

If only the total standard cost and actual cost per unit are given without breakup into material cost, labour cost etc., then we calculate only the total variance in the same way as we calculate sales price variance. Thus, we get it by multiplying the cost difference by the actual quantity **Produced** per unit.

If the break-up of cost is given then all variances in respect of each cost item are to be calculated by following usual principles applicable to a particular cost item.

(i) Change in Material Cost :

These are usual material cost variances and we compare the standards for actual output with the actuals and get normal Material Cost Variances.

(ii) Change in Labour Cost :

We follow usual principles applicable to labour cost variances and get the normal variances.

(iii) Change in Variable Cost :

We follow usual principles applicable to Variable Overheads cost Variances and get the normal variances.

(iv) Change in Fixed Overheads Cost :

We follow usual principles applicable to Fixed overheads cost variances and get the normal Variances.

(v) Change in Administration / Fixed S & D overheads : (under financial accounting)

As regards fixed expenses, we calculate only one variance which is Fixed Overheads expenditure variance. We calculate the same by comparing budgeted fixed overheads with actual Fixed Overheads. It should be noted that whereas Fixed production overheads cost variance is to be analysed into expenditure and volume variance, under absorption costing, the admn. and S & D fixed cost variance is only in respect of expenditure and there is nothing like volume variance here.

Under marginal costing, there would be only expenditure variance for all types of fixed overheads. If there is variable S & D overheads given then we develop the standards for actual quantity sold and the standard S & D variable cost would be compared with actual S & D cost to get Total variable S & D cost variance.

Valuation of raw material stock and calculation of price variance

There are two methods for accounting for variances and the stock valuation as well as the calculation of price variance would depend on the method of accounting selected. The methods are :

- a) Single Plan b) Partial Plan

A) Single Plan :

Under this method the price variance is based on actual quantity purchased and accordingly the stock would be obviously valued at standard price. The usual stock valuation methods like FIFO, LIFO, etc. have no relevance because the opening stock and closing stock would both be valued at standard price.

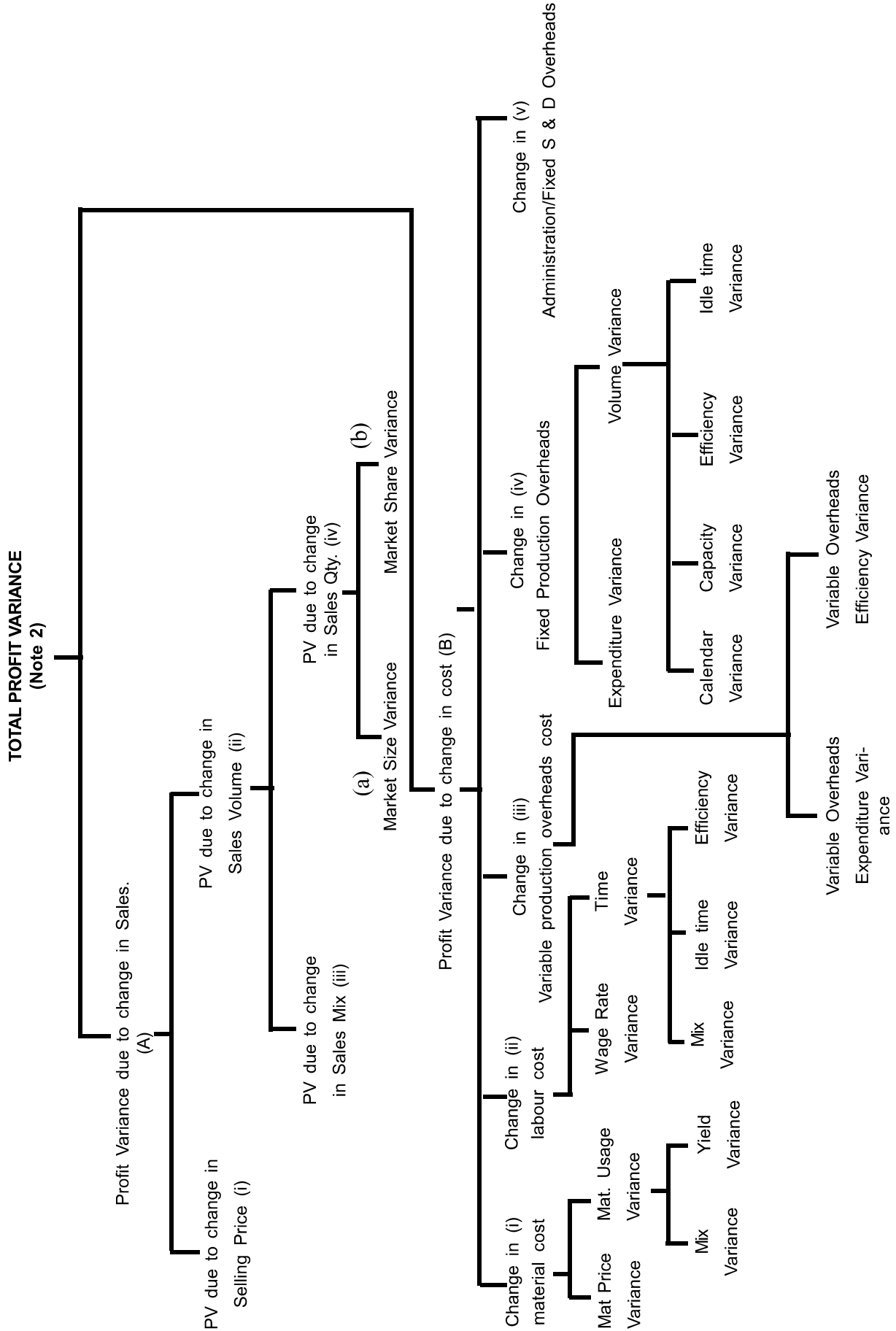
In case the standards are revised, then the opening stock valuation would be revised by valuing the quantity at revised standard price and the difference would be treated as the price variance of the period in which the revision takes place.

B) Partial Plan :

Under this method, the price variance is based on actual quantity consumed and accordingly, the stock has to be valued at actual purchase price.

If the opening stock is there, purchased at a price other than the current purchase price, we need to follow FIFO or LIFO method for valuation of stock as well as calculation of price variance.

It may be noted that revision of standards would not affect the opening stock valuation because the opening stock is valued at actual price.



CLASSWORK SECTION

Q. 1. Stick - well Ltd. is operating a standard costing technique. Standards for one batch revealed the following :

Materials	Quantity	Price	Total Cost
A	30	4	120
B	25	2.4	60
C	45	4	180
Input	100		
Loss	10		
Output	90		360

In a particular period, when five batches were produced, records revealed the following data :

Materials	Quantity	Price	Total Cost
A	180	4.5	810
B	160	3	480
C	260	3	780
Input	600		
Loss	150		
Output	450		2,070

You are required to compute the materials cost variances.

Q. 2. XYZ company manufactures product ABC by mixing three raw materials. For every 100 kgs of ABC, 125 kgs of raw materials are used. In April, 60 batches were prepared to produce at output of 5600 kgs of ABC. The standard and actual particulars are as follows :

	Standard		Actual	
	Mix %	Price per kg. ₹	Mix %	Price per kg. ₹
	Raw Material - I	50	40	60
Raw Material - II	30	20	20	16
Raw Material - III	20	10	20	12

You are required to compute the materials cost variances.

Q. 3. The standard material cost for 100 kg. of chemical D is made up of :

Chemical A - 30 kgs. @ ₹ 4.00 per kg.

Chemical B - 40 kgs. @ ₹ 5.00 per kg.

Chemical C - 80 kgs. @ ₹ 6.00 per kg.

In a batch, 500 kg. of chemical D were produced from a mix of :

Chemical A - 140 kgs. at a cost of ₹ 588

Chemical B - 220 kgs. at a cost of ₹ 1,056

Chemical C - 440 kgs. at a cost of ₹ 2,860

How do the yield, mix and the price factors contribute to the variance in the actual cost per 100 kg. of chemical D over the standard cost?

Q. 4. X Ltd. manufactures product X, each unit of which requires two kgs. of raw materials Y and 3 kgs of raw materials Z, to be bought at ₹ 5/- and ₹ 10/- respectively.

During the year, the company completed the production of 6,000 units. The details about purchases and stocks are given below :

	Particulars	Type	Qty.	Actual price
i)	Opening stock	Y	2000	₹ 6/-
		Z	4000	₹ 8/-
ii)	Purchases	Y	14000	₹ 4.50/-
		Z	17000	₹ 11/-
iii)	Closing stock	Y	3000	?
		Z	5000	?

Calculate the material cost variances. Solve by single & partial plan.

Q. 5. From the following details, compute the labour cost variances.

Standard Data (500 units)				Actual data (600 units)			
Type	Hours	Rate	Total	Type	Hours	Rate	Total
Skilled Men	300	3	900	Skilled Men	248	4	992.00
Skilled Women	120	2	240	Skilled Women	93	1.5	139.50
Unskilled	180	1	180	Unskilled	279	1	279.00
	600		1320		620		1410.50

Q. 6. X Ltd. manufactures product X which requires 2 hours of skilled men, 3 hours of semi-skilled men and 5 hours of unskilled men per unit at ₹ 5, 3 & 2 per hour respectively.

During January 2018, the production department reported output of 5000 units of product X. The labour cost incurred was as detailed below :

Type	Hours paid for	Rate per hour
Skilled	9,000	₹ 7
Semi-skilled	17,000	₹ 2.75
Unskilled	30,000	₹ 1.50
	56,000	

The total hours paid for included 1000 idle hours due to machine break down etc., out of which 500 hours pertained to skilled men, 400 hours pertained to semi skilled men and balance to unskilled men.

Required :

1. Calculate labour cost variances.
2. Recalculate the labour cost variances, given that the break up of 1000 idle hours is not given.

Q. 7. A company produces a single product from a single material, It operates a standard cost system and furnishes you the following information.

Particulars	Standard	Actual
Production	8,000	6,000
Materials :		
Total Quantity - Kgs	16,000	13,000
Total Amount	32,000	27,300
Labour :		
Total hours	2,400	2,000
Total amount	3,000	3,000
Variable overheads expenses :		
Total Amount	2,400	2,200

You are required to compute the necessary variances.

Q. 8. ABC Ltd. had prepared the following estimation for the month of April:

	Quantity	Rate (₹)	Amount (₹)
Material-A	800 kg.	45.00	36,000
Material-B	600 kg.	30.00	18,000
Skilled labour	1,000 hours	37.50	37,500
Unskilled labour	800 hours	22.00	17,600

Normal loss was expected to be 10% of total input materials and an idle labour time of 5% of expected labour hours was also estimated.

At the end of the month the following information has been collected from the cost accounting department:

	Quantity	Rate (₹)	Amount (₹)
Material-A	900 kg.	43.00	38,700
Material-B	650 kg.	32.50	21,125
Skilled labour	1,200 hours	35.50	42,600
Unskilled labour	860 hours	23.00	19,780

The company has produced 1,480 kg. finished product by using the followings:

You are required to calculate:

- (a) Material Cost Variance;
- (b) Material Price Variance;
- (c) Material Mix Variance;
- (d) Material Yield Variance;
- (e) Labour Cost Variance;
- (f) Labour Efficiency Variance and
- (g) Labour Yield Variance.

Q. 9. Following information is available from the books of Ex. Ltd.

	Standard data	Actual data
Days	25	27
Hours	5000	5500
Units	2500	2550
Overheads	50000	53000
Idle hours	--	200

You are required to compute fixed overheads cost variances and compute ratios in respect of fixed overheads.

Q. 10. Vinak Ltd. has furnished you the following information for the month of August.

	Budget	Actual
Output (units)	30,000	32,500
Hours	30,000	33,000
Fixed overheads	45,000	50,000
Days	25	26
Ideal Hours	----	200

Calculate the fixed overheads cost variances and ratios.

Q. 11. SJ Ltd. has furnished the following information:

Standard overhead absorption rate per unit	₹20
Standard rate per hour	₹4
Budgeted production	12,000 units
Actual production	15,560 units

Actual overheads were ₹ 2,95,000 out of which ₹ 62,500 fixed.

Actual hours 74,000

Overheads are based on the following flexible budget

Production (units)	8,000	10,000	14,000
Total Overheads (₹)	1,80,000	2,10,000	2,70,000

You are required to calculate the following overhead variances (on hour's basis) with appropriate workings:

- (i) Variable overhead efficiency and expenditure variance
- (ii) Fixed overhead efficiency and capacity variance.

Q. 12. In department A, the following data is submitted for the week ended 31st October :

Standard output for 40 hours per week	1,400	units
Standard fixed overheads	₹ 1,400/-	
Actual output	1,200	units
Actual hours worked	32	
Actual fixed overhead	₹ 1,500/-	

Prepare a statement of variances and ratios in respect fixed overheads. Assume practical capacity to be 2,000 units and also find capacity usage ratio.

Q. 13. Compute the missing data indicated by the question marks from the following :

Particulars	A	B
Standard price / unit	₹ 12	₹ 15
Actual price / unit	₹ 15	₹ 20
Standard Input (kgs.)	50	?
Actual Input (kgs.)	?	70
Material Price Variance	?	?
Material Usage Variance	?	₹ 300 A
Material Cost Variance	?	?

Material mix variance for both products together was ₹ 45 adverse.

Q. 14. From the following information about sales, calculate necessary sales variances.

Product	Standard			Actual		
	Nos	Rate in ₹ Per unit	Total ₹	Nos	Rate in ₹ Per unit	Total ₹
A	5,000	5	25,000	6,000	6	36,000
B	4,000	6	24,000	5,000	5	25,000
C	3,000	7	21,000	4,000	8	32,000
	12,000		70,000	15,000		93,000

The company's Budget market share was 20% and the actual market size was 90,000 units.

Q. 15. Modern Toys Ltd. had budgeted the following for a month :

Toy A	900 units at	₹	50	per unit.
Toy B	600 units at	₹	100	per unit.
Toy C	1500 units at	₹	75	per unit.

As against this, the actual sales were :

Toy A	1000 units at	₹	55	per unit
Toy B	700 units at	₹	95	per unit
Toy C	1100 units at	₹	78	per unit

The standard costs per unit of A, B, C were ₹ 45/- ₹ 85/- and ₹ 65/- respectively whereas actual costs per unit were ₹ 50/, ₹ 80/- and ₹ 70/- respectively.

Compute necessary sales and profit variances.

Q. 16. The standard profit per unit of Y is ₹ 3/-, ascertained as follows :

Materials (4 Kg at ₹ 1.50)	6.00
Labour (5 hours at Re. 0.80)	4.00
Overheads : variable at Re. 0.30 per hour	1.50
fixed at Re. 0.50 per hour	2.50
Total cost per unit	14.00
Profit per unit	3.00
Selling price	17.00

The standard cost statement has been drawn up on the basis of the production and sales of 4000 units per month as against the available capacity of 5000 units. For the month of March, 2014, the following profit and loss emerged :

	₹	₹
Sales (3,500 units)		66,000
Less : Cost of goods produced :		
Materials at ₹ 1.40 per Kg	21,000	
Labour at ₹ 0.85 per hour	15,640	
Variable overheads	5,200	
Fixed overheads	10,500	52,340
Actual Profit		13,660

Failure of power led to idleness of 1,000 hours.

You are required to reconcile the actual and standard profits on the basis of variances.