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CPA STUDY NOTES

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Business Environment and Concepts

AREA V- Planning and measurement (22%-28%)

GROUP C

COST MEASUREMENT

**Detail for Content Specification Outline
GROUP C – COST MEASUREMENT**

The candidate should be able to:

- Calculate gross profit margin.
- Define, identify, and/or calculate:
 - Fixed costs
 - Variable costs
 - Controllable costs
 - Sunk costs
 - Accounting costs
 - Opportunity costs
 - Standard cost variances
 - Regression analysis
- Identify, recognize and determine the effects of various inventory systems, such as just-in-time, including:
 - Advantages and disadvantages
 - Types of inventory techniques/innovations
 - Effect of specific inventory techniques/innovations on production costs in selected circumstances
- Identify and apply cost estimation and cost determination, especially through the use of cost drivers.
- Differentiate between cost-volume-profit analysis, target costing, and transfer pricing.
- Define and differentiate among job costing, process costing, and activity-based costing.
- Define and calculate joint and by-product costing, variable and absorption costing.

CONTENTS

1. *Classification of costs*
2. *Definitions of costs*
3. *Cost sheet format*
4. *Material Levels*
5. *Accounting Treatment*
6. *Job and Batch costing*
7. *Process costing*
8. *Joint product and By product costing*
9. *Operation costing*
10. *Marginal costing*
11. *Standard costing (Different methods of learning and remembering)*
12. *Transfer pricing*
13. *Budgetary control*
14. *Zero based budgeting*
15. *Activity based costing*
16. *Relevant costing*

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CLASSIFICATION OF COSTS:

We first classify costs according to the three elements of cost:

- a) Materials
- b) Labor
- c) Expenses

Product and Period Costs: We also classify costs as either

- 1 Product costs: the costs of manufacturing our products; or
- 2 Period costs: these are the costs other than product costs that are charged to, debited to, or written off to the income statement each period.

The classification of Product Costs:

1. Direct costs
2. Indirect costs

Definitions:

- Controllable costs
- Sunk costs
- Accounting costs
- Opportunity costs

Controllable costs:

Variable costs such as direct materials, direct labor, and variable overhead are usually considered controllable by the department manager. Further, a certain portion of fixed costs can also be controllable. For example, certain advertising spent specifically for a given department would be an expense controllable by the manager of that department. Advertising expenses that benefit many departments or products are, however, Non controllable Costs.

Sunk costs:

Sunk costs are unrecoverable past expenditures. These should not normally be taken into account when determining whether to continue a project or abandon it, because they cannot be recovered either way. It is a common instinct to count them, however.

Accounting costs:

The total amount of money or goods expended in an endeavor. It is money paid out at some time in the past and recorded in journal entries and ledgers.

Opportunity costs:

The cost of an alternative that must be forgone in order to pursue a certain action. Put another way, the benefits you could have received by taking an alternative action.

The difference in return between a chosen investment and one that is necessarily passed up. Say you invest in a stock and it returns a paltry 2% over the year. In placing your money in the stock, you gave up the opportunity of another investment - say, a risk-free government bond yielding 6%. In this situation, your opportunity costs are 4% (6% - 2%).

Direct costs: Direct costs are generally seen to be variable costs and they are called direct costs because they are directly associated with manufacturing. In turn, the direct costs can include:

- Direct materials: plywood, wooden battens, fabric for the seat and the back, nails, screws, glue.
- Direct labour: sawyers, drillers, assemblers, painters, polishers, upholsterers
- Direct expense: this is a strange cost that many texts don't include; but (International Accounting Standard) IAS 2, for example, includes it. Direct expenses can include the costs of special designs for one batch, or run, of a particular set of tables and/or chairs, the cost of buying or hiring special machinery to make a limited edition of a set of chairs.

Total direct costs are collectively known as Prime Costs and we can see that Product Costs are the sum of Prime costs and Overheads.

Indirect Costs: Indirect costs are those costs that are incurred in the factory but that cannot be directly associate with manufacture. Again these costs are classified according to the three elements of cost, materials labour and overheads.

- Indirect materials: Some costs that we have included as direct materials would be included here.
- Indirect labour: Labour costs of people who are only indirectly associated with manufacture: management of a department or area, supervisors, cleaners, maintenance and repair technicians
- Indirect expenses: The list in this section could be infinitely long if we were to try to include every possible indirect cost. Essentially, if a cost is a factory cost and it has not been included in any of the other sections, it has to be an indirect expense. Here are some examples include:

Depreciation of equipment, machinery, vehicles, buildings

Electricity, water, telephone, rent, Council Tax, insurance

Total indirect costs are collectively known as Overheads.

Finally, within Product Costs, we have Conversion Costs: these are the costs incurred in the factory that are incurred in the conversion of materials into finished goods.

The classification of Period Costs:

The scheme shows five sub classifications for Period Costs. When we look at different organisations, we find that they have period costs that might have sub classifications with entirely different names. Unfortunately, this is the nature of the classification of period costs; it can vary so much according to the organisation, the industry and so on. Nevertheless, such a scheme is useful in that it gives us the basic ideas to work on.

Administration Costs: Literally the costs of running the administrative aspects of an organisation. Administration costs will include salaries, rent, Council Tax, electricity, water, telephone, depreciation, a potentially infinitely long list. Notice that there are costs here such as rent, Council Tax, that appear in several sub classifications; in such cases, it should be clear that we are paying rent on buildings, for example, that we use for manufacturing and storage and administration and each area of the business must pay for its share of the total cost under review.

Without wishing to overly extend this listing now, we can conclude this discussion by saying that the costs of Selling, the costs of Distribution and the costs of Research are all accumulated in a similar way to the way in which Administration Costs are accumulated. Consequently, our task is to look at the selling process and classify the costs of running that process accordingly: advertising, market research, salaries, bonuses, electricity, and so on. The same applies to all other classifications of period costs that we might use.

Finance Costs: Finance costs are those costs associated with providing the permanent, long term and short term finance. That is, within the section headed finance costs we will find dividends, interest on long term loans and interest on short term loans.

Finally, we should say that we can add any number of sub classifications to our scheme if we need to do that to clarify the ways in which our organisation operates. We will also add further sub classifications if we need to refine and further refine our cost analysis.

COST SHEET – FORMAT

<u>Particulars</u>	<u>Amount</u>	<u>Amount</u>
Opening Stock of Raw Material	***	
<u>Add:</u> Purchase of Raw materials	***	
<u>Add:</u> Purchase Expenses	***	
<u>Less:</u> Closing stock of Raw Materials —	***	
Raw Materials Consumed	***	
Direct Wages (Labour)	***	
Direct Charges	***	
Prime cost (1)		***
<u>Add</u> :- Factory Over Heads:		
Factory Rent	***	
Factory Power	***	
Indirect Material	***	
Indirect Wages	***	
Supervisor Salary	***	
Drawing Office Salary	***	
Factory Insurance	***	
Factory Asset Depreciation	***	
Works cost Incurred		***
<u>Add:</u> Opening Stock of WIP	***	
<u>Less:</u> Closing Stock of WIP —	***	
Works cost (2)		***
<u>Add</u> :- Administration Over Heads:-		
Office Rent	***	
Asset Depreciation	***	
General Charges	***	
Audit Fees	***	
Bank Charges	***	
Counting house Salary	***	
Other Office Expenses	***	
Cost of Production (3)		***
<u>Add:</u> Opening stock of Finished Goods	***	
<u>Less:</u> Closing stock of Finished Goods —	***	
Cost of Goods Sold		***
<u>Add</u> :- Selling and Distribution OH:-		
Sales man Commission	***	
Sales man salary	***	

Traveling Expenses	***	
Advertisement	***	
Delivery man expenses	***	
Sales Tax	***	
Bad Debts	***	
Cost of Sales (5)		***
Profit (balancing figure)		***
Sales		***

Notes:-

- 1) Factory Over Heads are recovered as a percentage of direct wages
- 2) Administration Over Heads, Selling and Distribution Overheads are recovered as a percentage of works cost.

MATERIAL LEVELS

- 1) Reorder level = Maximum usage * Maximum lead time
(Or) Minimum level + (Average usage * Average Lead time)
- 2) Minimum level = Reorder level – (Average usage * Average lead time)
- 3) Maximum level = Reorder level + Reorder quantity – (Minimum usage * Minimum lead time)
- 4) Average level = $\frac{\text{Minimum level} + \text{Maximum level}}{2}$ (or)
Minimum level + $\frac{1}{2}$ Reorder quantity
- 5) Danger level (or) safety stock level
= Minimum usage * Minimum lead time (preferred)
(or) Average usage * Average lead time
(or) Average usage * Lead time for emergency purposes
- 6) EOQ (Economic Order Quantity - Wilson's Formula) = $\sqrt{2AO/C}$
Where A = Annual usage units
O = Ordering cost per unit
C = Annual carrying cost of one unit
i.e. Carrying cost % * Carrying cost of unit
- 7) Associated cost = Buying cost pa + Carrying cost pa
- 8) Under EOQ Buying cost = Carrying cost
- 9) Carrying Cost = Average inventory * Carrying cost per unit pa * Carrying cost %
(Or) Average Inventory * Carrying cost per order pa
- 10) Average inventory = EOQ/2
- 11) Buying cost = Number of Orders * ordering cost
- 12) Number of Orders = Annual Demand / EOQ
- 13) Inventory Turnover (T.O) Ratio = $\frac{\text{Material consumed}}{\text{Average Inventory}}$

- 14) Inventory T.O Period = $\frac{365}{\text{Inventory Turn over Ratio}}$
- 15) safety stock = $\frac{\text{Annual Demand}}{365} * (\text{Maximum lead time} - \text{Average lead time})$
- 16) Total Inventory cost = Ordering cost + Carrying cost of inventory + Purchase cost
- 17) Input Output Ratio = $\frac{\text{Quantity of input of material to production}}{\text{Standard material content of actual output}}$

Remarks :-

- 1) High Inventory T.O Ratio indicates that the material in the question is fast moving
- 2) Low Inventory T.O Ratio indicates over investment and locking up of working Capital in inventories

ACCOUNTING TREATMENT

- 1) Normal Wastage = It should be distributed over goods output increasing per unit cost
- 2) Abnormal Wastage= It will be charged to costing profit and loss a/c
- 3) Sale value of scrap is credited to costing profit and loss a/c as an abnormal gain.
- 4) Sale proceeds of the scrap can be deducted from material cost or factory overheads.
- 5) Sale proceeds of scrap may be credited to particular job.
- 6) Normal Defectives = cost of rectification of defectives should be charged to specific
- 7) Abnormal Defectives = This should be charged to costing profit and loss a/c
- 8) Cost of Normal spoilage is to borne by good units
- 9) Abnormal spoilage should be charged to costing profit and loss a/c

Treatment of Over/Under absorption of overheads:-

- i) If under absorbed and over absorbed overheads are of small value then it should be transferred to costing profit and loss a/c
- ii) If under and over absorption occurs due to wrong estimates then cost of product manufactured should be adjusted accordingly.
- iii) If the same accrued due to same abnormal reasons the same should be transferred to costing profit & loss a/c

JOB AND BATCH COSTING

With job costing, we are dealing with one off situations. We are dealing with organisations that carry out functions and services on a one at a time basis. Good examples of job costing situations include jobbing builders: the builder who will provide a householder, or a shop owner, or a factory owner with a service that he provides for no one else. The jobbing builder will build an extension, or renovate some property to a design that will probably not be copied anywhere else at any time: it is a one off job. Job costing can apply in non manufacturing situations as well as in manufacturing situations.

Even though many jobbing enterprises are small scale, we are not suggesting that all jobbing enterprises are small scale enterprises. An engineering shop may be working on a job for a customer that takes several months and many man and machine hours to complete.

Here are two definitions:

A job is “A customer order or task of relatively short duration”

Job costing is “A form of specific order costing; the attribution of cost to jobs”

Batch costing is not normally seen as much of an advance on job costing.

A batch is A group of similar articles which maintains its identity throughout one or more stages of production and is treated as a cost unit Batch costing is A form of specific order costing; the attribution of costs to batches.

Economic Batch Quantity = $EBQ = \sqrt{2AS/C}$

Where A = Annual Demand

S = Setting up cost per batch

C= Carrying cost / unit of production.

PROCESS COSTING

Format of process a/c

Particulars	Unit	Rate	Rs.	Particulars	Unit	Rate	Rs.
To Direct material				By Normal Loss			
To Direct Labour				By Units transferred to other process			
To Indirect material				By Abnormal loss (B/F)			
To Other Expenses							
To Abnormal gain(B/F)							
Total				Total			

Format of Abnormal loss

Particulars	Unit	Rs.	Particulars	Unit	Rs.
To Process a/c			By Sale of wasted units		
			By costing P & L a/c		
Total			Total		

Format of Abnormal gain a/c

Particulars	Units	Rs.	Particulars	Units	Rs.
To Normal Loss a/c			By Process a/c (names of different process)		
To costing P&L a/c					
Total			Total		

- 1) To find the cost per unit for valuation of units to be trans. to next process and also for abnormal, loss or gain = $\frac{\text{Total process cost} - \text{Salvage value of normal spoilage}}{\text{Total units introduced} - \text{Normal loss in units}}$
- 2) To find abnormal loss (or) gain (all in units):

$$= \text{Units from previous process} + \text{fresh units introduced} - \text{Normal loss} - \text{units transferred to next process}$$
 (If the result is positive then abnormal loss. If negative then abnormal gain)
- 3) In case of opening WIP and closing WIP are given then there are different methods of valuation of closing WIP
 - i) FIFO Method
 - ii) LIFO Method
 - iii) Average Method
 - iv) Weighted Average Method
- 4) Various statements to be prepared while WIP is given:
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- i) Statement of equivalent production
 - ii) Statement of cost
 - iii) Statement of apportionment of cost
 - iv) Process cost a/c
- 5) FIFO Method: In these method total units transferred to next process includes full opening stock units and the closing stock includes the units introduced during the process. In this method the cost incurred during the process is assumed as to be used
- a) First to complete the units already in process
 - b) Then to complete the newly introduced units
 - c) For the work done to bring closing inventory to given state of completion
- 6) LIFO Method = Cost incurred in process is used for:
- a) First to complete newly introduced units
 - b) Then to complete units already in process in this method closing stock is divided into two :
 - i) Units which represent opening stock but lie at the end of the period
 - ii) Newly introduced units in closing stock.
- 7) Average Method: In this method
- a) No distinction is made between opening stock and newly introduced material.
 - b) In finding cost per unit, cost incurred for opening stock is also to be added with current cost. (This addition is not done in LIFO & FIFO method as cost incurred in that process is only taken)
- 8) Weighted average method: This method is only used when varied product in processed through a single process. General procedure is adopted here.
- a) Statement of weighted average production should be prepared. Under this statement output of each products is expressed in terms of points.
 - b) Cost of each type of product is computed on basis of Points.
- Points of vital importance in case of Abnormal Gain / Loss:
- a) Calculate cost per unit by assuming there is no abnormal loss / gain
 - b) Cost per unit arrived above should be applied for valuation of both abnormal Loss/gain units and output of the process.

c) Separate a/c for both abnormal loss/gain is to be prepared.

JOINT PRODUCT AND BY PRODUCT COSTING

Methods of apportioning joint cost over joint products :

- 1) Physical unit method = Physical base to measure (i.e.) output quantity is used to separate joint cost. Joint cost can be separated on the basis of ratio of output quantity. While doing this wastage is also to be added back to find total quantity.
- 2) Average unit cost method = In this method joint cost is divided by total units Produced of all products and average cost per unit is arrived and is multiplied With number of units produced in each product.
- 3) Survey method or point value method = Product units are multiplied by points or weights and the point is divide on that basis.
- 4) Standard cost method = Joint costs are separated on the basis of standard cost set for respective joint products.
- 5) Contribution margin method = Cost are divided into two categories (i.e.) variable and fixed. Variable costs are separated on unit produced. Fixed on the basis of contribution ratios made by different products.
- 6) Market value method:-
 - a) Market value at the point of separation: Joint cost to sales revenue[£] percentage is found which is called as multiplying factor = $\frac{\text{Joint cost}}{\text{Sales Revenue}} * 100$
 - Joint cost for each product is apportioned by applying this % on sales revenue of each product.
 - Sales revenue = Sales Revenue at the point of separation.
 - This method cannot be done till the sales revenue at the separation point is given.
 - b) Market value after processing: Joint cost is apportioned on the basis of total sales Value of each product after further processing.
 - c) Net Realizable value method = Form sales value following items are deducted

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- i) Estimated profit margin
- ii) Selling and distribution expenses if any included.
- iii) Post split off cost

The resultant amount is net realizable value. Joint cost is apportioned on this basis.

Bi-product → Method of accounting

- Treat as other income in profit and loss a/c
- Net Realizable value of Bi-product is reduced from cost of main product.
- Instead of standard process, Standard cost or comparative price or re-use price is credited to joint process a/c.

OPERATION COSTING

Service costing is “A cost accounting method concerned with establishing the costs of services rendered”. Service costing is also applied within a manufacturing setting.

The Differences Between Product Costing and Service Costing?

- There may be very few, if any, materials to worry about
- Overheads will comprise the most significant portion of any costs of which, labour costs may well comprise as much as 70%

No.	Enterprise	Cost per unit
1.	Railways or bus companies	Per passenger-kilometer
2.	Hospital	Per patient/day, per bed/day
3.	Canteen	Meals served , cups of tea
4.	Water supply service	Per 1000 gallons
5.	Boiler House	1000 kg of steam
6.	Goods Transport	Per tonne km, quintal km
7.	Electricity Boards	Per kilowatt – hours
8.	Road maintenance department	Per mile or road maintenance
9.	Bricks	One thousand
10.	Hotel	Per room/day

In this various terms such as passenger km, quintal km, tonne km, these are all known as composite units and are computed in 2 ways:

- a) Absolute (weighted average): (e.g.) tones km - Multiplying total distance by respective load quantity.
- b) Commercial (simple average): (e.g.) tonne Km–Multiplying total distance by average load quantity

All accumulated cost is classified into 3 categories:

- 1) Standing charges (or) fixed cost
- 2) Running cost (or) variable cost
- 3) Maintenance charges (or) semi variable cost

Running charges = Fuel, Driver Wages, Depreciation, oil etc.

Maintenance charges = Supervision salary, Repairs and Maintenance

Note:-

- % of factory overheads on direct wages
- % of administration overheads on works cost
- % of selling & distribution overheads on works cost
- % of profit on sales

Operating cost sheet :-

	Particulars	Total cost	Cost per km
A	<u>Standing charges :-</u> License fees Insurance Premium Road tax Garage rent Driver's wages Attendant-cum-cleaner's wages Salaries and wages of other staff		
	Total		
B	<u>Running charges :-</u> Repairs and maintenance Cost of fuel (diesel, petrol etc.) Lubricants, grease and oil Cost of tires, tubes and other spare parts Depreciation		
	Total		
C	Total charges [(A) + (B)]		

MARGINAL COSTING

Statement of profit:-

Particulars	Amount
Sales	***
Less:- Variable cost	***
Contribution	***
Less:- Fixed cost	***
Profit	***

- 1) Sales = Total cost + Profit = Variable cost + Fixed cost + Profit
- 2) Total Cost = Variable cost + Fixed cost
- 3) Variable cost = It changes directly in proportion with volume
- 4) Variable cost Ratio = {Variable cost / Sales} * 100
- 5) Sales – Variable cost = Fixed cost + Profit
- 6) Contribution = Sales * P/V Ratio
- 7) Profit Volume Ratio [P/V Ratio]:-
 - {Contribution / Sales} * 100
 - {Contribution per unit / Sales per unit} * 100
 - {Change in profit / Change in sales} * 100
 - {Change in contribution / Change in sales} * 100
- 8) Break Even Point [BEP]:-
 - Fixed cost / Contribution per unit [in units]
 - Fixed cost / P/V Ratio [in value] (or) $\frac{\text{Fixed Cost} * \text{Sales value per unit}}{(\text{Sales} - \text{Variable cost per unit})}$
- 9) Margin of safety [MOP]
 - Actual sales – Break even sales
 - Net profit / P/V Ratio
 - Profit / Contribution per unit [In units]

10) Sales unit at Desired profit = {Fixed cost + Desired profit} / Cont. per unit

11) Sales value for Desired Profit = {Fixed cost + Desired profit} / P/V Ratio

12) At BEP Contribution = Fixed cost

13) Variable cost Ratio = $\frac{\text{Change in total cost}}{\text{Change in total sales}} \times 100$

14) Indifference Point = Point at which two Product sales result in same amount of profit

$$= \frac{\text{Change in fixed cost}}{\text{Change in variable cost per unit}} \quad (\text{in units})$$

$$= \frac{\text{Change in fixed cost}}{\text{Change in contribution per unit}} \quad (\text{in units})$$

$$= \frac{\text{Change in Fixed cost}}{\text{Change in P/Ratio}} \quad (\text{in Rs.})$$

$$= \frac{\text{Change in Fixed cost}}{\text{Change in Variable cost ratio}} \quad (\text{in Rs.})$$

15) Shut down point = Point at which each of division or product can be closed

$$= \frac{\text{Maximum (or) Specific (or) Available fixed cost}}{\text{P/V Ratio (or) Contribution per unit}}$$

If sales are less than shut down point then that product is to shut down.

Note :-

1) When comparison of profitability of two products if P/V Ratio of one product is greater than P/V Ratio of other Product then it is more profitable.

2) In case of Indifference point if

Sales > Indifference point --- Select option with higher fixed cost (or) select option with lower fixed cost.

STANDARD COSTING

Method one of reading:-

Material:-

- | <u>SP * SQ</u> | <u>SP * AQ</u> | <u>SP * RSQ</u> | <u>AP * AQ</u> |
|----------------------------|----------------|-----------------|----------------|
| (1) | (2) | (3) | (4) |
| a) Material cost variance | = | (1) – (4) | |
| b) Material price variance | = | (2) – (4) | |
| c) Material usage variance | = | (1) – (2) | |
| d) Material mix variance | = | (3) – (2) | |
| e) Material yield variance | = | (1) – (3) | |

Labour :-

- | <u>SR*ST</u> | <u>SR*AT (paid)</u> | <u>SR*RST</u> | <u>AR*AT</u> | <u>SR*AT(worked)</u> |
|-------------------------------|---------------------|---------------|--------------|----------------------|
| (1) | (2) | (3) | (4) | (5) |
| a) Labour Cost variance | = | (1) – (4) | | |
| b) Labour Rate variance | = | (2) – (4) | | |
| c) Labour Efficiency variance | = | (1) – (2) | | |
| d) Labour mix variance | = | (3) – (5) | | |
| e) Labour Idle time variance | = | (5) – (2) | | |

Variable Overheads cost variance :-

- | <u>SR * ST</u> | <u>SR * AT</u> | <u>AR * AT</u> |
|--|----------------|----------------|
| (1) | (2) | (3) |
| a) Variable Overheads Cost Variance | = | (1) – (3) |
| b) Variable Overheads Expenditure Variance | = | (2) – (3) |
| c) Variable Overheads Efficiency Variance | = | (1) – (2) |

[Where: SR =Standard rate/hour = $\frac{\text{Budgeted variable OH}}{\text{Budgeted Hours}}$]

Fixed Overheads Cost Variance:-

- | <u>SR*ST</u> | <u>SR*AT(worked)</u> | <u>SR*RBT</u> | <u>SR*BT</u> | <u>AR*AT(paid)</u> |
|----------------------------------|----------------------|---------------|--------------|--------------------|
| (1) | (2) | (3) | (4) | (5) |
| a) Fixed Overheads Cost Variance | = | (1) – (5) | | |

- b) Fixed Overheads Budgeted Variance = (4) – (5)
- c) Fixed Overheads Efficiency Variance = (1) – (2)
- d) Fixed Overheads Volume Variance = (1) – (4)
- e) Fixed Overheads Capacity Variance = (2) – (3)
- f) Fixed Overheads Calendar Variance = (3) – (4)

Sales value variance:-

<u>Budgeted Price*BQ</u>	<u>BP*AQ</u>	<u>BP*Budgeted mix</u>	<u>AP*AQ</u>
(1)	(2)	(3)	(4)

- a) Sales value variance = (4) – (1)
- b) Sales price variance = (4) – (2)
- c) Sales volume variance = (2) – (1)
- d) Sales mix variance = (2) – (3)
- e) Sales quantity variance = (3) – (1)

Note :-

i) Actual margin per unit (AMPU) = Actual sale price – selling cost per unit

ii) Budgeted margin per unit (BMPU) = Budgeted sale price – selling price per unit

Sales margin variance :-

<u>BMPU*BQ</u>	<u>BMPU*AQ</u>	<u>BMPU*Budgeted mix</u>	<u>AMPU*AQ</u>
(1)	(2)	(3)	(4)

- a) Sales margin variance = (4) – (1)
- b) Sales margin price variance = (4) – (2)
- c) Sales margin volume variance = (2) – (1)
- d) Sales margin mix variance = (2) – (3)
- e) Sales margin quantity variance = (3) – (1)

Control Ratio :-

1) Efficiency Ratio = $\frac{\text{Standard hours for actual output}}{\text{Actual hours worked}} * 100$

2) Capacity Ratio = $\frac{\text{Actual Hours Worked}}{\text{Budgeted Hours}} * 100$

3) Activity Ratio = $\frac{\text{Actual hours worked}}{\text{Budgeted hours}} * 100$

Verification: Activity Ratio = Efficiency * Capacity Ratio

STANDARD COSTING

Method two of reading:-

Material:-

- a) Material cost variance = $SC - AC = (SQ * AQ) - (AQ * AP)$
- b) Material price variance = $AQ (SP - AP)$
- c) Material usage variance = $SP (SQ - AQ)$
- d) Material mix variance = $SP (RSQ - AQ)$
- e) Material yield variance = $(AY - SY \text{ for actual input}) \text{ Standard material cost per unit of output}$
- f) Material revised usage variance (calculated instead of material yield variance)
= $\left[\begin{array}{cc} \text{standard quantity} & - \text{Revised standard} \\ \text{for actual output} & \text{quantity} \end{array} \right] * \text{Standard price}$

Labour :-

- a) Labour Cost variance = $SC - AC = (SH * SR) - (AH * AR)$
- b) Labour Rate variance = $AH (SR - AR)$
- c) Labour Efficiency or time variance = $SR (SH - AH)$
- d) Labour Mix or gang composition Variance = $SR (RSH - AH)$
- e) Labour Idle Time Variance = $\text{Idle hours} * SR$
- f) Labour Yield Variance = $\left[\text{Actual Output} - \text{Standard output for actual input} \right] * \text{Standard labour cost/unit of output}$
- g) Labour Revised Efficiency Variance (instead of LYV) =
 $\left[\text{Standard hours for actual output} - \text{Revised standard hours} \right] * \text{Standard rate}$

Notes :- i) $LCV = LRV + LMV + ITV + LYV$

ii) $LCV = LRV + LEV + ITV$

iii) $LEV = LMV, LYV$ (or) $LREV$

Overhead variance :- (general for both variable and fixed)

a) Standard overhead rate (per hour) = $\frac{\text{Budgeted Overheads}}{\text{Budgeted Hours}}$

b) Standard hours for actual output = Budgeted hours * $\frac{\text{Actual Output}}{\text{Budgeted output}}$

c) Standard OH = Standard hrs for actual output * Standard OH rate per hour

d) Absorbed OH = Actual hrs * Standard OH rate per hour

e) Budgeted OH = Budgeted hrs * Standard OH rate per hour

f) Actual OH = Actual hrs * Actual OH rate per hour

g) OH cost variance = Absorbed OH – Actual OH

Variable Overheads variance :-

a) Variable OH Cost Variance = Standard OH – Actual OH

b) Variable OH Exp. Variance = Absorbed OH – Actual Variable OH

c) Variable OH Efficiency Variance = Standard OH – Absorbed OH
= $\left[\frac{\text{Standard hours for actual output} - \text{Actual hours}}{\text{actual output}} \right] * \text{Standard rate for variable OH}$

Fixed Overheads variance :-

a) Fixed OH Cost Variance = Standard OH – Actual OH

b) Fixed OH expenditure variance = Budgeted OH – Actual OH

c) Fixed OH Efficiency Variance = Standard OH (units based) – Absorbed OH (Hours based)

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$$\begin{aligned} \text{d) Fixed OH Volume Variance} &= \text{Standard OH} - \text{Budgeted OH} \\ &= [\text{Standard hrs for actual output} - \text{Budgeted hrs}] * \text{standard rate} \end{aligned}$$

$$\text{e) Fixed OH capacity variance} = \text{Absorbed OH} - \text{Budgeted OH}$$

$$\begin{aligned} \text{f) Fixed OH Calendar Variance} &= [\text{Revised budgeted hrs} - \text{Budgeted hrs}] \\ &\quad * \text{Standard rate/hrs} \end{aligned}$$

Note:- When there is calendar variance capacity variance is calculated as follows :-

$$\begin{aligned} \text{Capacity variance} &= [\text{Actual hours} - \text{Revised Budgeted hrs}] * \text{Standard rate/hour} \\ &\quad (\text{Revised}) \end{aligned}$$

Verification :-

$$\begin{aligned} \text{i) variable OH cost variance} &= \text{Variable OH Expenditure variance} \\ &\quad + \text{Variable OH Efficiency variance} \end{aligned}$$

$$\text{ii) Fixed OH cost variance} = \text{Fixed OH Expenditure variance} + \text{Fixed OH volume variance}$$

$$\begin{aligned} \text{iii) Fixed OH volume variance} &= \text{Fixed OH Efficiency variance} + \text{Capacity variance} \\ &\quad + \text{Calendar variance} \end{aligned}$$

Sales variances :-

Turnover method (or) sales value method :-

$$\text{a) Sales value variance} = \text{Actual Sales} - \text{Budgeted Sales}$$

$$\begin{aligned} \text{b) Sales price variance} &= [\text{Actual Price} - \text{Standard price}] * \text{Actual quantity} \\ &= \text{Actual sales} - \text{standard sales} \end{aligned}$$

$$\begin{aligned} \text{c) Sales volume variance} &= [\text{Actual-Budgeted quantity}] * \text{Standard price} \\ &= \text{Standard sales} - \text{Budgeted sales} \end{aligned}$$

$$\begin{aligned} \text{d) Sales mix variance} &= [\text{Actual quantity} - \text{Revised standard quantity}] * \text{Standard price} \\ &= \text{Standard sales} - \text{Revised sales} \end{aligned}$$

$$\begin{aligned} \text{e) Sales quantity variance} &= [\text{Revised standard variance} - \text{Budgeted quantity}] \\ &\quad * \text{Standard price} \end{aligned}$$

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= Revised Standard sales – Budgeted sales

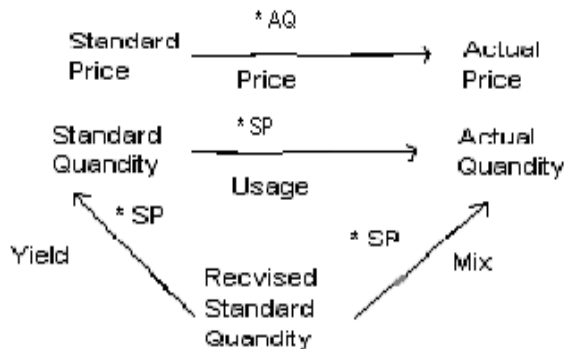
Profit method:-

- a) Total sales margin variance = (Actual Profit–Budgeted price)
= {Actual quantity * Actual profit per unit} -
 {Budgeted quantity * Standard profit per unit}
- b) Sales margin price variance=Actual profit–Standard profit
= {Actual Profit per unit – Standard profit per unit} * Actual quantity of sales
- c) Sales margin volume variance = Standard profit – Budgeted Profit
= {Actual quantity – Budgeted quantity} * Standard profit per unit
- d) Sales margin mix variance = Standard profit – Revised Standard profit
= {Actual quantity – Revised standard quantity} * Standard profit per unit
- e) Sales margin quantity variance = Revised standard profit - Budgeted profit
= {Revised standard quantity – Budgeted quantity} * Standard profit per unit

STANDARD COSTING

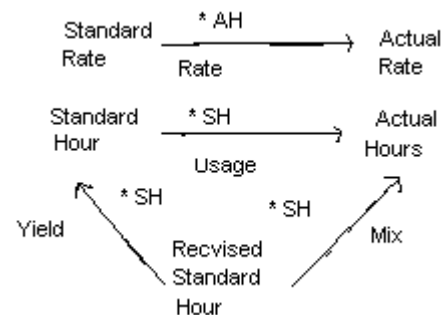
Diagrammatic Representation: -

Material Variance: -



$$\text{Material cost variance} = SC - AC = (SQ * AQ) - (AQ * AP)$$

Labour Variances:-

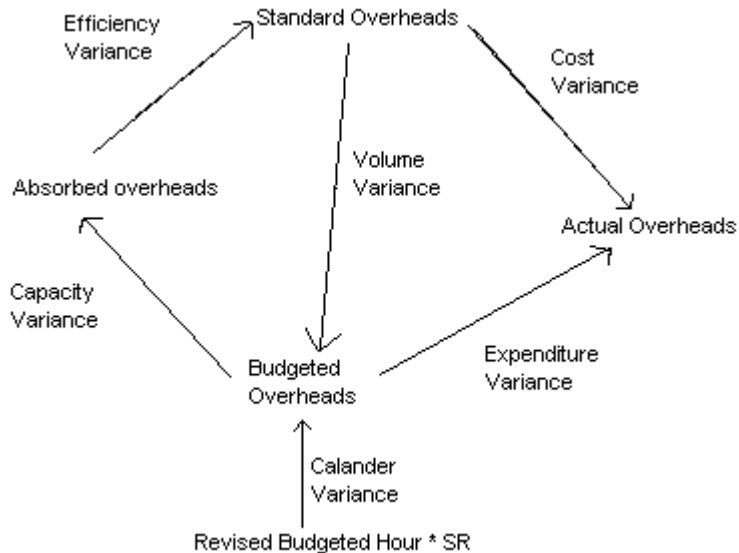


$$\text{Labour Cost variance} = SC - AC = (SH * SR) - (AH * AR)$$

Fixed Overhead Variance : -

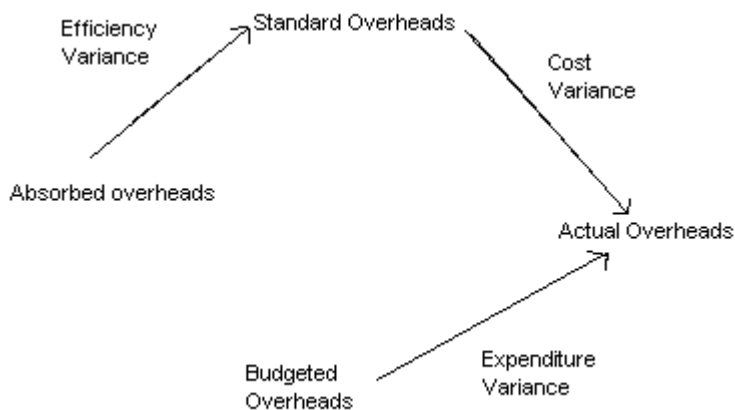
- Standard OH = Standard hrs for actual output * Standard OH rate per hour
- Absorbed OH = Actual hrs * Standard OH rate per hour
- Budgeted OH = Budgeted hrs * Standard OH rate per hour
- Actual OH = Actual hrs * Actual OH rate per hour
- Revised Budgeted Hour = Actual Days * Budgeted Hours per day
(Expected hours for actual days worked)

When Calendar variance is asked then for capacity variance Budgeted Overhead is (Budgeted days * Standard OH rate per day)

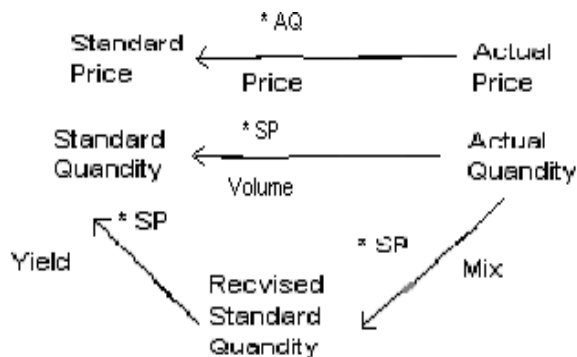


Revised Budgeted Hour (Budgeted hours for actual days) = Actual days * Budgeted hours per day

Variable Overhead Variance :-

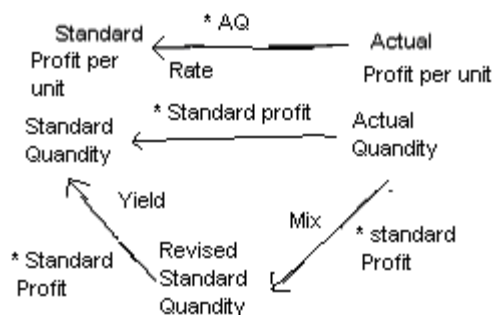


Sales Value Variances : -



Sales value variance = Actual Sales – Budgeted Sales

Sales Margin Variances : -



Total sales margin variance = (Actual Profit–Budgeted price)
 = {Actual quantity * Actual profit per unit}-
 {Budgeted quantity * Standard profit per unit}

[Where :-

SC = Standard Cost,
 SP = Standard Price,
 AP = Actual Price,
 AY = Actual Yield,
 RSQ = Revised Standard Quantity,
 ST = Standard Time

AC = Actual Cost
 SQ = Standard Quantity
 AQ = Actual Quantity
 SY = Standard Yield
 SR = Standard Rate,
 AR = Actual Rate,

AT = Actual Time

BP = Budgeted Price,

RBT = Revised Budgeted Time

BMPU = Budgeted Margin per Unit

AMPU = Actual Margin per Unit

RST = Revised Standard Time,

BQ = Budgeted Quantity

Reconciliation:-

Reconciliation statement is prepared to reconcile the actual profit with the budgeted profit

Particulars	Favorable	Unfavorable	(Rs)
Budgeted Profit :			
Add Favorable variances			
Less Unfavorable variances			
Sales Variances :			
Sales price variance			
Sales mix variance			
Sales quantity variance			
Cost variance :-			
Material :			
Cost variance			
Usage variance			
Mix variance			
Labour :			
Rate variance			
Mix variance			
Efficiency variance			
Idle time variance			
Fixed overhead variance :			
Expenditure variance			
Efficiency variance			
Fixed overhead variance :			
Expenditure variance			
Efficiency variance			
Capacity variance			
Calendar variance			

Transfer Pricing

A transfer price is the amount of money that one unit of an organisation charges for goods and services to another unit of an organisation.

One of the key aspects here is that a transfer price is equivalent to an ordinary selling price and that any department or division that sets a transfer price is effectively selling its goods and services at a profit or a loss to another department or division within its organisation. Any part of an organisation using transfer pricing will be classed as a profit centre: since it is operating with a view to making a profit (whether positive, profit, or negative, loss). If goods and services are transferred between departments and divisions at cost, then no profit or loss arises and the issue of transfer pricing does not, or should not, arise.

Organisations have a system of transfer pricing, therefore, in order to assess the efficiency and effectiveness of its department and divisional managers. This maybe in spite of the fact that transfer prices may be artificial in the sense that it is felt that there is no rationale for “selling” between departments and divisions.

Criteria for fixing Transfer Pricing:-

- i) External Capacity not fully utilized = Variable Cost
- ii) Capacity fully Utilized
 - a) If single product :-
Selling Price (–) Selling Expenses
 - b) If multiple product
Variable cost + Opportunity cost (measured on the basis of Product actually sacrificed)
- iii) If no market for Intermediate product
Cost of supplying division of optimum level
(–) Cost of the supplying division at previous output level.
Difference in Output

(This would be equal to Variable cost when Fixed Cost is same at all levels)

Note:-

- i) Ignore Variable Selling expenses on Inter Department Transfer
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- ii) In case of (ii) above If selling expenses is not given we have to assume some % as selling Expenses but it should not exceed 5% .

Budgetary Control

Budget Ratios:-

- 1) Capacity usage Ratio
= $\frac{\text{Budgeted Hours}}{\text{Maximum possible working hours in budget period}} \times 100$
- 2) Standard Capacity Employed Ratio
= $\frac{\text{Actual Hours Worked}}{\text{Budgeted hours}} \times 100$
- 3) Level of Activity Ratio
= $\frac{\text{Standard Hours for Actual Production}}{\text{Standard Hours for Budgeted Production}} \times 100$
- 4) Efficiency Ratio
= $\frac{\text{Standard Hours for Actual Production}}{\text{Actual Hours}} \times 100$
- 5) Calendar Ratio
= $\frac{\text{Actual Working days}}{\text{Budgeted working days}} \times 100$

Zero Base Budgeting:

The name zero base budgeting derives from the idea that such budgets are developed from a zero base: that is, at the beginning of the budget development process, all budget headings have a value of ZERO. This is in sharp contrast to the incremental budgeting system in which in general a new budget tends to start with a balance at least equal to last year's total balance, or an estimate of it.

Definition of Zero Base Budgeting (ZBB)

“A method of budgeting whereby all activities are reevaluated each time a budget is set. Discrete levels of each activity are valued and a combination chosen to match funds available”.

Objectives and Benefits of ZBB

What zero base budgeting tries to achieve is an optimal allocation of resources that incremental and other budgeting systems probably cannot achieve. ZBB starts by asking managers to identify and justify their area(s) of work in terms of decision packages (qv).

An effective zero base budgeting system benefits organisations in several ways. It will

- Focus the budget process on a comprehensive analysis of objectives and needs
- Combine planning and budgeting into a single process
- Cause managers to evaluate in detail the cost effectiveness of their operations
- Expand management participation in planning and budgeting at all levels of the organisation

Activity Based costing

In Traditional Method we split the Over Head incurred in production, based on machine hours which are not acceptable for many reasons.

In ABC method Over Head are splitted according to the related activity, for each type of Over Head. Overhead are apportioned among various Production cost centers on the basis of Activity cost drivers.

Relevant Costing - some theory

Introduction: -

A management decision involves predictions of costs & revenues. Only the costs and revenues that will differ among alternative actions are relevant to the decision. The role of historical data is to aid the prediction of future data. But historical data may not be relevant to the management decision itself. Qualitative factors may be decisive in many cases, but to reduce the number of such factors to be judged, accountants usually try to express many decision factors as possible in quantitative terms.

Meaning of Relevant Costs: -

Relevant costs represent those future costs that will be changed by a particular decision. While irrelevant costs are those costs that will not be affected by a decision. In the short run, if the relevant revenues exceed the relevant costs then it will be worthwhile accepting the decision. Therefore relevant costs play a major role in the decision-making process of an organization. A particular cost can be relevant in one situation but irrelevant in another, the important point to note is that relevant costs represent those future costs that will be changed by a particular decision, while irrelevant costs are those costs that will not be affected by that decision. We shall now see what are relevant costs and revenues for decision-making process. In summary relevant information concerns:

Other Important Terminologies : -

Relevant costs are costs appropriate to aiding the making of specific management decisions. Actually, to affect a decision a cost must be:

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Future: Past costs are irrelevant as they are not affected them by future decisions & decisions should be made as to what is best now.

Incremental: This refers to additional revenue or expenditure, which may appear as a result of our decision-making.

(A cash flow - Such charges as depreciation may be future but do not represent cash flows and, as such, are not relevant.)

Sunk costs: Past costs, not relevant for decision making

Committed costs: This is future in nature but which arise from past decisions, perhaps as the result of a contract.

Disclaimer: This material is a compilation of various resources available on net. Let me know if you come across any mistakes and know that I am not responsible for these mistakes. I used this material for my preparation and wanted to share this with fellow CPA Students.