**IMPORTANT COSTING FORMULAS-mainly for CA-IPCC,CS-Inter,CWA-Inter & to some extent helpful for CA final**

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 **STANDARD COSTING**

**(a)Material cost variances**

 **(1)price variance=(Sp-AP)\*aq consumed**

 **(2)usage variance=(SQAO-Aq) sp**

 **(3)mix variance=(RSQ-AQ) \*SP**

 **(4)yield variance=(SQAO-RSQ)sp or (SQ-AQ)weighted avg std price**

**(B) labour variances**

 **(1) labour rate variance =(SR-AR)AHP**

 **(2)labour efficiency variance=(SHAO-AHW)SR**

 **(3)Idle time variance=Idle hrs\*SR**

 **(4)yield variance=(SHAO-RSH)SR**

 **(5)labour mix variance or gang variance=(RSH-ASH)SP**

**(c) variable overhead variances**

 **(1) expenditure variance=(SR- AR)AHW**

 **(2)Efficiency variance=(SH-AHW)SR**

**(d) fixed overhead variances**

 **(1)volume variance=recovered(actual hrs\*budgeted rate /hr)-budgeted hrs**

 **(2)expenditure variance=budgeted oh- actual**

 **(3) capacity variance=(AHW-budgted hrs)recovery rate/hr**

 **(4)calendar variance=(actual days- budgeted days)\*recovery rate/day**

 **(5) efficiency variance=(SHAO-AHW)\*recovery rate/hr**

**(E) Total cost/price/oh variance =Expenditure variance+ efficiency variance**

**(F) volume variance=efficiency variance + capacity variance**

**(G) sales variance(turnover based)**

 **(a) sales price variance=(BSP-AP)AQ**

 **(b) sales volume variance=(BQ-AQ)BSP**

 **(c) sales mix variance=(RSQ-AQ sold) BSP**

 **(d)sales yield variance=(SQ-RSQ)BSP**

 **(e) sales qty variance=budgeted sales- revised std sales**

**(H) Sales variance( margin based/profit variance)**

 **(a) sales margin price variance=(BSP-ASP)AQ**

 **(b) sales margin qty/volume variance=(BQ-AQ)budgeted margin p.u.**

 **(c ) yield variance= (BQ-RSQ) BM/unit**

 **(d) mix variance=(RSQ-AQ) Bm/unit**

**(I) market variance**

 **(a) market size variance=budget market share % \*(budgeted industry sale-actual industry sale)budgeted contribution p.u.**

 **(b) market share variance= change in share \*Actual industry sale\*weighted avg budgeted contribution p.u.**

 **PLANNING OPERATING VARIANCE**

**ORIGINAL REVISED ACTUAL**

**(qty\* rate=amount) (original qty\*revised rate=amt) (actual qty\*actual**

 **Rate=actual amount)**

**(a)planning variance=sp\*sq-sq\*rsp i.e. original-revised (UNCONTROLLABLE VARIANCE)**

**(b) operating variance= sq\*rsp- aq\*ap i.e. revised –actual (CONTROLLABLE VARIANCE)**

 **(i) price variance =(rsp-ap)aq consumed**

 **(ii)usage variance=(rsq-aq)rsp**

 **(iii) mix variance=(rsq-aq)rsp**

 **(iv)yield variance=(Sq-Rsq)RSP**

**(c) total variance=planning+ operational variance**

**(d) traditional variance=original – actual**

 **RECONCILIATION STATEMENT**

**(A)ABSORPTION**

**Budgeted profit**

 **+/-sales variance(price/volume variance)-based on profit**

 **+/- cost variances**

 **DM(price & usage variance)/DL(rate & efficiency) /D oh(expenditure & efficiency)/ fixed oh (expenditure/volume)**

**ACTUAL PROFIT**

**(B)MARGINAL**

**As above but volume variance based on budgeted contribution per unit.**

**And fixed oh volume variance not to be computed**

 **SAMPLE BALANCED SCORECARD**

**GROWTH FACTOR PRICE RECOVERY FACTOR PRODUCTIVITY**

**(A)revenue effect of (a)revenue effect of price favourable/**

**Growth Sales price variance adverse material**

**(sales vol.variance (BSP-AP)aq sold usage variance**

**(BQ-AQ)\*BSP (b)cost effect of price**

**(B)cost effect of growth (material price variance)**

**(total cost variance) (i) (SR-AR)AQ purchased**

**(BQ-AQ)budgeted VC (ii)fixed oh expenditure variance**

 **=budgeted –actual**

 **(III) any other cost effect**

 **BUDGETARY CONTROL**

**OBJECTIVE- To compare actual performance with the budgeted performance to find out varaiance and to avoid these variance in future**

**CONTROL RATIOS-**

**(1)Activity ratio=SHAO/Budgeted hrs\*100**

**(2)Capacity ratio=AHW/budgeted hrs\*100**

**(3) Efficiency ratio=SHAO/AHW\*100**

**BUDGETS-**

**(1)SALES BUDGET-**

**Particulars qty rate pu. Amount**

**(2) CASH BUDGET**

**Opening balance**

**+receipts**

**-payments**

**Closing balance**

**(3)PRODUCTION BUDGET**

**Sales budget**

**+closing budget**

**=total production**

**-opening stock**

**=production budget**

**(4)RAW MATERIAL CONSUMPTION BUDGET**

 **Raw material consumed p.u. of finished goods\*total units of finished goods**

**(5)PURCHASE BUDGET**

**Consumption of raw material**

**+closing stock of raw material**

**-opening stock**

 **COST SHEET/SINGLE COSTING/OUTPUT COSTING/UNIT COSTING**

|  |  |
| --- | --- |
| **DIRECT MATERIAL****Op stock****+purchases(including carriage inwards,freight)****-closing stock** **RAW MATERIAL CONSUMED****DIRECT LABOUR****DIRECT EXPENSES** **PRIME/DIRECT/IDENTIFIED COST****MANUFACTURING OH/FACTORY OH** **-SCRAP****+DEPRECIATION ON PLANT AND MACHINERY** **GROSS WORKS COST****+OP WIP****-CLOSING WIP** **NET FACTORY COST****+ADMINISTRATION & OFFICE EXPENSE** **COST OF PRODUCTION****+OP STOCK OF FINISHED GOODS** **COST OF GOODS AVAILABLE****-CL STOCK OF FINISHED GOODS** **COST OF GOODS SOLD****+SELLING & DISTRIBUTION OH** **COST OF SALES****+PROFIT** **SALES** | XXXXXXXXXXXXX |

**PRODUCTION A/C**

|  |  |  |  |
| --- | --- | --- | --- |
| **To op stock of rm****Purchase of rm****Freight/carriage****To rm consumed****Direct labour****Direct expense****To prime cost****To factory oh****To dep on P &M****To Gross factory cost** **To opening stock of wip****To factory cost** **To office & administration oh****To cost of production****To opening stock of finished goods****To cost of goods sold** **To selling and distribution oh****To cost of sales****profit** |  | **By rm consumed****By cl stock of rm****By prime cost****By gross factory cost****By closing stock of wip****By factory cost****By cost of production****By closing stock of finished goods****By cost of goods sold****By cost of sales****sales** |  |

 **LABOUR COSTING**

1. **LABOUR TURNOVER RATE**
2. **Separation method(period wise)=no. of employees separated/avg no. of employees \*100**
3. **Replacement method(period wise)=no. of replacements/avg no. of workers \*100**
4. **Flux rate method = no. of separations+no. of replacements/avg workers\*100**
5. **Equivalent annual rate=turnover rate\* 365days/no. of days in the relevant period\*100**

**(2)LABOUR EFFICIENCY RATE=actual output /std output \*100**

 **Or = std time/actual time \*100**

1. **Straight –piece wage rate=actual output \* straight piece rate/piece**
2. **FORMULA ORIENTED BONUS SCHEME/INCENTIVE PLAN**

|  |  |
| --- | --- |
| **1.Halsey plan****2.Halsey wier plan****3.Rowan plan****4.Merricks-multiple piece rate system****5.Bath scheme****6.bedeaux system****7.Gantt task & bonus system****8.emerson plan****9)taylor’s differential rate system** | **Total earnings=time taken\*hourly rate+ time saved \*hourly rate \*50%****Total earnings=time taken\*hourly rate +time saved \*hourly rate\*30%****Total earnings = time taken\*hourly rate +time saved/SHAO\*actual time\*hourly rate****Total earnings=actual output\*differential piece rate****Where,diff piece rate****Efficiency level -differential piece**  **Rate****<=83% 100%straight piece wage** **>83%-100% 110%****>100% 120%****Total earnings = ^(std hrs\*hrs worked) \*hrly wage rate** **Total earnings=total no. of B’s\*wage rate per B****Wage rate per B =wage per minute****Total no. of B=total minutes worked+75%minutes saved****Level of efficiency total wages****<100% time wages****100% time wages+20%bonus****>100% straight piece wage rate+20%bonus****Total earnings=time wages + bonus (x% of time wages)****Level efficiency bonus****<=662/3% NIL****>662/3%-100% x% increase in steps**  **& comes to maximum**  **Level of 20% at 100 %** **Efficiency****>100% 20%+1% addition for**  **Every 1%additional efficiency in excess of 100%****Total earnings=actual output\*differential piece rate****Differential piece rate means****Level of efficiency differential piece**  **Rate****Upto 100% 80%/83%(choice of company) of straight piece rate****100% or more 120/125%(as per the choice of company)** |

**Calculation of earnings**

**Normal wages**

**+overtime wages**

**+DA/Bonus**

**=gross wages earned by worker**

**-deduction from wages**

**(a) employees contribution to PF/ ESI**

**=net wages**

**LABOUR COST PER HOUR**

**Normal wages**

**+DA**

**+bonus**

**+employer’s contribution to PF/ESI**

**+leave salary**

**+expenditure on amenities**

**Total labour cost**

**/working hrs= labour cost/hr**

 **CONTRACT ACCOUNT**

|  |  |  |  |
| --- | --- | --- | --- |
| **To plant or stores sent to site****To material purchased****To wages+accrued wages****To miscellenous expense & oh****To direct expense****To cost of contract to date b/d****To notional profit****To P & L****To reserve (WIP)** |  | **By plant/store/material c/d(closing balance)****By cost of contract to date( b/f)****By contractee a/c (escalation clause)****By wip****Value of work certified****Value of work uncertified****By notional profit b/d** |  |

**Notional profit=value of work certified+ cost of work uncertified-cost of contract to date**

**Estimated profit=total contract price- total estimated cost**

**Total estimated cost=cost of contract to date + estimated additional cost+ provision for contingencies**

**% of work certified= value of work certified/total contract price\*100**

**PARAMETERS OF TRANSFERING AMOUNT TO P & L ACCOUNT ON THE BASIS OF WORK CERTIFIED**

|  |  |
| --- | --- |
| **% of work certified to date****(1)<25%****(2)25-50%****(3)50% or more****(4) near completion stage** | **Amount to be transferred to p & L a/c****Nil****1/3\*notional profit\*cash received/work certified****2/3\*notional profit\*cash received/work certified****(a)estimated profit\*work certified/contract price****(b) estimated profit\*work certified/contract price\*cash received/work certified****(C) estimated profit \*cash received /work certified\* cost of contract to date/total estimated cost** |

 **MARGINAL COSTING**

**(1)Contribution=sales- variable cost**

**(2) profit volume ratio(P/V)= contribution/sales\*100**

 **Or =fixed cost/BEP(value)**

 **Or =change in profit/change in sales\*100**

**(3) Break Even point(BEP)**

 **In units =Fixed cost/contribution p.u.**

 **In value = Fixed cost/p/v ratio**

**(4) composite BEP**

 **In units =composite FC/composite contribution p.u.(i.e. total units\*cont. p.u/total units)**

**(5) Sales for desired profit**

**In units =FC+desired profit/cont. p.u**

**In value = FC+ desired profit/ P/v ratio**

**(6) margin of safety= margin of safety/sales\*100**

**MOS= actual sales – BEP sales**

**MOS(units) =profit/contribution pu.**

**MOs value = profit/p/v ratio**

**(7) profit= sales-vc or sales\*p/v ratio-FC**

 **MATERIAL COSTING**

1. **Material turnover ratio= material consumption/avg stock**
2. **Input-output ratio= Input/output \*100**
3. **EOQ=^2UP/s u=annual usage ,p cost of placing and receiving 1order,s = storage & carrying cost including interest per unit per annum**
4. **Total ordering+ storage & carrying cost = ^2UPS**
5. **No of orders ina yr=annual usage /eoq**
6. **Time gap between 2 orders=365days/12months/52weeks //no.of orders**
7. **Order point/re order level=safety stock/ minimum stock or buffer stock**

**+ avg requirement during lead time**

 **Or Reorder level=maximum usage rate \*maximum lead time**

1. **Minimum stock =ROL-(avg usage rate \*avg lead time)**
2. **Maximum stock=ROL+ Roq/Eoq –(minimum usage rate \*minimum lead time)**

**Or minimum stock + Roq /eoq**

**10) avg stock =(minimum stock + maximum stock)**

**11) danger level = emergency period\* avg usage time**

**12) required qty=difference in fixed cost/difference in vc p.u.**

**(13)MATERIAL COST STATEMENT**

**Material purchase cost**

**-trade discount**

**Purchase cost after discount**

**+sales tax/container cost**

**Invoice value**

**+insurance charges**

**+freight/delivery charges**

**-resale value of the container**

**NET purchase cost**

**+stores overhead(if any)**

**TOTAL MATERIAL COST**

 **OPERATING COSTING(mainly in transport industry)**

**Operating cost statement**

**Standing charges xxx per tone-km**

**Running charges xxx do**

**TOTAL COST PU PER TONNE KM**

**VARIABLE MAINTENANCE COST PER KM=difference in total maintenance/difference in total kms**

**FIXED MAINTENANCE= Total maintenance –variable maintenance**

 **OVERHEAD**

1. **DIRECT MATERIAL COST METHOD=amount of factory overhead/cost of direct material used\*100**
2. **DIRECT LABOUR COST METHOD=amount of factory OH/cost of direct labour\*100**
3. **PRIME COST METHOD= amount of factory OH/ prime cost \*100**
4. **MACHINE HOUR RATE METHOD/general or blanket rate=Amount of factory OH/machine hours\*100**
5. **LABOUR HOUR RATE METHOD= amount of factory OH /total no. of direct labour hours\*100**
6. **NO. OF JOBS /CUSTOMER’S METHOD=total annual production OH /total no. of jobs \*100**
7. **OFFICE OH ABSORPTION METHOD**
8. **As a % of factory cost=total administration oh/total factory cost\*100**
9. **Similarly it can be calculated on the basis of factory oh/sales/conversion cost/GP**

**(8)selling OH Recovery /absorption rate**

 **(a) as per article=total selling & distribution OH/no. of products sold**

 **(b)As a percentage of works cost/selling price= total selling & distribution OH/total sales\*100**

 **RECONCILTIATION OF COST & FINANCIAL ACCOUNTS**

|  |  |  |
| --- | --- | --- |
| **Particulars****Profit in cost books****+excess recoveries in cost****-under recoveries in cost** | **+** | **-** |

 **Costing p&l**

|  |  |  |  |
| --- | --- | --- | --- |
| **To op stock****To dm/dl/dw****To overheads****To profit** |  | **by sales****by closing stock****-wip****Finished goods** |  |

 **OPERATING CYCLE**

**Operating cycle =R+W+F+D-C**

**Where , R= raw material holding period**

 **R=(Avg stock of raw material)(no. of days in a yr)/total annual consumption of Raw material**

 **W=WIP holding period**

 **W= (avg stock of WIP)(no. of days in a yr)/total annual cost of production**

 **F= Finished Goods holding period**

 **F=(avg stock of finished goods)(no of days in a yr)/total annual cost of goods sold**

 **D=Debtors collection period**

 **D=(avg debtor balance)(no. of days in a yr)/total annual credit sales**

 **C= credit payment period**

 **C=(Avg creditors balance)( no. of days in a yr)/total annual credit purchases**

 **LEVERAGE ANALYSIS ,EBIT- EPS ANALYSIS**

**(1)without preference dividend**

 **(a) operating leverage=% change in EBIT or operating profit/%change in sales**

 **Or,contribution/EBIT**

 **(b) financial leverage=%change in EBT/% change in EBIT**

 **Or , exisiting EBIT/existing EBT**

 **(c) combined leverage=% change in EBT/ % change in sales**

 **Or , existing contribution/existing EBT**

 **Or, DCL= DOL\*DFL**

**(2) with preference dividend**

 **(a) DOL= contribution/contribution-FC**

 **(b) DFL= EBIT/EBT- (PD/1-tax)**

 **(c) DCL= contribution /EBIT-(PD/1-tax)**

 **INCOME STATEMENT**

**Sales**

**-Variable cost**

**=contribution**

**-fixed cost**

**=EBIT**

**-Interest**

**=EBT**

**-tax**

**=PAT/EAT**

**-preference dividend**

**=earning available to equity shareholders**

**EPS( earning available /no. of shares)**

**P/E ratio**

**MP/Share=EPS\*P/E ratio**

**FINANCIAL BEP=I +(pd/1-t)**