MAR GREGORIOS COLLEGE OF ARTS & SCIENCE

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Affiliated to the University of Madras
Approved by the Government of Tamil Nadu
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DEPARTMENT OF COMMERCE (ACCOUNTING & FINANCE)

SUBJECT NAME: ADVANCED COST ACCOUNTING

SUBJECT CODE: CPG6B

SEMESTER: VI

PREPARED BY: PROF.M.PREMA

SYLLABUS

UnitI:ContractCosting

Definition-FeaturesofContractCosting-CalculationofProfitonContracts-CostplusContract-ContractCostingVsJobcosting-PreparationofContractA/c.

UnitII:ProcessCosting

Features of Process costing - Process Loss - Normal and Abnormal Loss - AbnormalGain - Joint Products - By Products - Concept of Equivalent Production - ProcessAccounts-ProcessLossess&Gains.

UnitIII:OperationCosting

OperatingCosting-Meaning-PreparationofOperatingCostSheet-TransportCosting-PowerSupplyCosting-HospitalCosting-SimpleProblems.

UnitIV:MarginalCosting

Meaning - Features - Absorbtion Costing - Marginal Costing Vs Absorbtion Costing -Contribution-PVRatio-BreakEvenPoint-KeyFactor-MarginofSafety-PreparationofMarginalCostStatement.

UnitV :StandardCosting

Definition-Objectives-Advantages-StandardCostandEstimatedCost-InstallationofStandardCosting-Varianceanalysis-Material,Labour,OverheadandSalesVariances

- CalculationofVariances.

Note:QuestionsinSec.A,B&Cshallbeintheproportionof20:80betweenTheoryandProblems.

SuggestedReadings

1. Jain,S.P&Narang,K.L.,CostAccounting,KalyaniPublishers
2. MurthyA&GurusamyS,CostAccounting,VijayNicoleImprintsPvt.Ltd.Chennai
3. Khanna,B.S.Pandey,I.M-Ahuja,G.KandAroraM.N.,PracticalCosting,SChand&Sons
4. Reddy,T.S.andHariprasadReddy,Y,CostAccounting,MargamPublications
5. Prasad,N.KandPrasad,V.K,CostAccounting,BookSyndicate
6. SaxenaandVashist,CostAccountingSulthanChandandSons,2014,NewDelhi

UNIT- I CONTRACT ACCOUNT

Introduction

Contract costing, also known as terminal costing, is a variant of jobcosting.Contractmeans abigjobinwhichwork isdoneat siteand notin factory premises. The cost of each contract is ascertained. Thus in thismethodof costing,eachcontractisacostunitandan accountisopenedforeachcontractinthebooksofcontractortoascertainprofit/lossthereon

FeaturesofContractCosting

Contractcostingusuallyshowsthefollowingfeatures:.

1. Contractsaregenerallyoflargesizeand,therefore,acontractor usuallycarriesoutasmallnumberofcontractsataparticularpointoftime.
2. Acontractgenerallytakesmorethanoneyeartocomplete,
3. Workoncontractsiscarried outatthesiteofcontractsandnotinfactorypremises.
4. Eachcontractundertakenistreatedasacostunit.
5. A separate contract account is prepared foreach contract in the books of contractor toascertainprofitorlossoneachcontract.
6. Mostofthematerialsarespeciallypurchasedforeachcontract.Thesewill,therefore,be charged direct from the supplier's invoices. Any materialsdrawn from the store arechargedtocontract onthebasisofmaterialrequisitionnotes.
7. Nearlyalllabourcostwill bedirect.
8. Mostexpenses(*e.g.*,electricity,telephone,insurance,etc.)arealsodirect.
9. Specialistsubcontractorsmaybeemployedforsay,electricalfittings,weldingwork,glasswork,etc.
10. Plantandequipmentmaybepurchasedforthecontractormaybehiredforthedurationofthecontract.
11. Payments by the customer (contractee) are made at various stages of completion of thecontract based on architect'scertificate for the completed stage. An amount, known asretentionmoney,iswithheldbythecontracteeasperagreedterms.
12. Penalties may be incurred by the contractor for failing to complete the work within theagreedperiod.

ContractCostingandJobCosting—Distinction

Mainpointsofdistinctionbetweencontractcostingandjobcostingareasfollows:

1. Contractisgenerallybigwhilejobissmall.Itiswellsaid,"ajobisasmallcontractandacontractisabigjob."
2. Thenumberofjobsundertakenata timeareusuallylargeascomparedtonumberofcontractsbecausecontractsaregenerallymuchbiggerinsize.
3. Incontractcostingmostofthecostsarechargeabledirecttocontractaccounts.Underjobcosting, directallocationtosuchanextentis notpossible.
4. Allocationandapportionmentofoverheadcostsissimplerincontractcostingascomparedtojobcosting.
5. Jobsareusuallycarriedoutinfactorypremiseswhilecontractworkisdoneatsite.

ContractCostingProcedure

Thebasicprocedureforcostingofcontractsisasfollows:

1. Contractaccount. Eachcontractisallottedadistinctnumberandaseparateaccountisopenedforeachcontract.

2. Directcosts. Mostof the costs of acontract can beallocated directto the contract.Allsuchdirectcostsaredebitedtothecontractaccount.Directcostsforcontractsinclude: (*i*)Materials,(*ii*)Labourandsupervision,(*iii*)Directexpenses,(*iv*)Depreciationofplantand machinery,(*v*)Subcontractcosts,etc.

3. **Indirectcosts.**Contractaccountisalsodebitedwithoverheadswhichtend tobesmallinrelationtodirectcosts.Suchcostsareoftenabsorbedonsomearbitrarybasisasapercentageon prime cost,or materials, or wages, etc.Overheads are normally restricted tohead office andstoragecosts.

4. Transferofmaterialsorplant. Whenmaterials,plantorotheritemsaretransferredfromthecontract,thecontractaccount iscreditedbythatamount.

5. Contractprice. Thecontract accountisalso credited with thecontract price.However,whena contractisnot complete atthe end of the financialyear, the contractaccount iscreditedwiththevalueofwork-in-progressasonthatdate.

6.

Profitorlossoncontract. Thebalanceofcontractaccountrepresentsprofitorlosswhichistransferredto ProfitandLossAccount.However,whencontractisnotcompleted

within the financial year, only apart of theprofit arrived is taken into account and the remainingprofitiskeptasreserveto meetany contingentlossontheincompleteportion ofthecontract.Thisisdiscussedindetaillaterinthischapter.

SPECIALPOINTSINCONTRACTCOSTING

Someoftheimportantpointsincontractcostingarenowdiscussed:

CostofMaterials

Materialsinclude(*i*)materialsspecifically purchased forthecontract;(*ii*)materialsissuedfrom storeagainstmaterial requisition notes.Thecostofboththesetypes ofmaterialsisdebitedtothecontract account.

Materialsreturned tostore. Whenevermaterialsareissued in excessofrequirements,asforinstance,cement,sand,pipes,bricks,etc.,thesearelaterreturnedto thestoreaccompaniedbyaMaterialReturnNotewhichgivesthedetailsofthematerialreturned.Suchreturnedmaterialsarecreditedtocontractaccount.

Materialsatsite. Attheendofeachaccountingperiod,valueofmaterialslyingunusedatsiteiscreditedtocontractaccountandiscarriedforwardforchargingagainstthenextperiod.

CostofLabour

Allwagesofworkersengagedonaparticularcontractarecharged directtothecontractirrespectiveofthetypeofworktheyperform.Whenseveralcontractsarerunningatdifferentlocations,payrollisnormallysectionalisedsoastohaveseparatepayrollforeachcontract.Difficultiesincostingmaybeencounteredwhensomeworkersmayhavetomovefromonesitetoanotherwhenanumberofsmallcontractsareundertaken.Insuchsituation,itbecomesnecessary to provide time sheets from which allocations can be made. In order to control labourutilisationandpreventfraudin thepaymentofwages,surprisevisitsbyheadofficepersonnelwillbenecessary.

PlantDepreciation

Therearetwodifferentmethodsofdealingwithdepreciationofplantincontractaccount:

Contractaccountisdebitedwiththecostoftheplantinstalled.Attheendoftheyearorwhenthe plantisnolongerrequired,theplantisrevaluedandcontractaccountiscreditedwiththisrevalued ordepreciatedfigure.Incaseplantissoldonthe completionof thecontract,thecontractaccountiscreditedwithitssaleproceeds.Theneteffectoftheabovedebitandcreditwillbethatthe contractaccountwillstanddebitedwiththeamountofdepreciationwhichisthe difference between the value of plant debited and value of plant credited.

The method isgenerallyusedonlongcontractswhichextendovermorethanoneyearbecausedepreciatedvalueoftheplantiscredited tothecontractaccountand broughtdownasanopening balanceinthenextperiod.

(b) Alternatively,contractaccountissimply debited with theamountof depreciation.Itisusualtousethismethodwhenplantissenttocontractonlyforashortperiod.Forexample,mobilecraneorbulldozerusedinacontractmaybechargedonthisbasis.

However,whenaplantishiredforacontract,achargeforthehireoftheplantisdebitedtothecontractasadirectexpense.

SubcontractCosts

Workofspecialisedcharacter,forwhichfacilitiesarenotinternallyavailable,isofferedto asubcontractor.Forexample,steelwork,glasswork,painting,etc.,isusuallycarried outbythesubcontractorswho areaccountableto themain contractor.Thecostof suchwork ischargedtothecontract account.

PaymentbasedonArchitect'sCertificate

Incasethecontractissmall,fullpaymentisusuallymadeonthecompletionofthecontract.Butincaseof large contracts,itmaytakemorethanoneyeartocomplete.Insuch acase,ifnopayment isreceiveduntilthecompletionofthecontract,thefinancialresourcesofthecontractorcouldsurelybecomestrained.Therefore,asystemofprogresspaymentsisagreedbyparties.Inthissystem,partpaymentsofthecontract amountarepaidfromtimetotimeonthebasisofcertificateissuedbythearchitects(actingforthecontractee),certifyingthe

valueoftheworksatisfactorilycompleted.Suchpaymentsreceivedbythecontractorareusuallycredited to thepersonal account of the contractee.It should be noted that such payments are notenteredintheContractAccount.

Work-in-progress—WorkCertifiedandUncertified

Whenthecontractisnotcompletedtilltheendoftheaccountingyear,thearchitectisrequiredtovaluethework-in-progress.Suchwork-in-progressisclassifiedintoworkcertifiedandworkuncertified.

Work Certified. This is that part of the work-in-progress which has been approved by thecontractee'sarchitectorengineerforpayment.Workcertifiedisvaluedatcontractprice(*i.e*,sellingprice),andinclude sanelementof profit.

Work Uncertified. This is thatpart of the work-in-progress which is not approved by thearchitectorengineer.Thisisvaluedatcostandthusdoesnotincludeanelementofprofit.

Bothworkcertified anduncertifiedappearonthecreditsideofthe contractaccountandalsontheassetssideofthebalancesheet.

RetentionMoneyandCashRatio

Itisusualpracticenottopaythefullamountofwork certified.Thecontracteemaypayafixedpercentage,say80%or90%oftheworkcertified,dependinguponthetermsofthe contract.Thisisknownas*CashRatio*.Thebalanceamountnotpaidisknownas*RetentionMoney*.Forexample,ifcashratio is75%,theretentionmoneywillberemaining25%.Thisretention money isatypeof securityforany defective work which may be foundin thecontractlateron.Thisalsoworksasadeterrentforthecontractortoleavethecontractincomplete,ifhefindsthecontract unprofitable.Theretention moneymayalsobeadjustedagainstpenaltiesthatbecomedueifthecontractisnotcompletedwithinthestipulatedtimeas perthetermsoftheagreement.

ExtraWork

Sometimesthecontractorisrequiredtodosomeextraworklikeadditionsoralterationsintheworkoriginally doneas peragreement.Thecontractorwillcharge extramoney forsuchextrawork.Thecostofsuchextraworkisdebitedtothecontractaccountandextrapricerealisediscreditedtotheco ntractaccount

PROFIT ONINCOMPLETECONTRACTS

Contracts which are started and finished during the same financial year create no accountingproblems.But incase of those contractswhich takemorethan oneyear to complete, aproblemariseswhetherprofitonsuchcontractsshouldbeworkedoutonlyonthecompletionofthecontractoratthe end ofeach financialyearon the partly completed work.If profitiscomputedonlyonthecompletionofthecontract,profitwillbehighintheyearofcompletionofthecontract,wherea s in otheryearsof workingon contract,profitwill benil. Thiswould resultnotonlyin distortedprofitpatternbutalso highertaxliabilitybecauseincometaxathigherratesmay haveto be paid.Therefore,whencontractsextend beyond ayear,itbecomesnecessary totake intoaccountthe profitearned(orlossincurred)onthe work performed duringeachyear.Thishelps in avoiding distortion of the year-to-yearprofit trend of thebusiness. There are twoaspectsofprofitcomputation:

(a) Computationofnotionalprofitorestimatedprofit.

(b) ComputationoftheportionofsuchprofittobetransferredtoProfitandLossAccount.

Notional Profit

Notionalprofitisthedifferencebetweenthevalueofwork-in-progresscertifiedandthecostofsuchwork-in-progresscertified.

PortionofNotionalProfitorEstimatedprofittobeTransferredtoProfitandLossAccount

The portion ofthe notionalorestimated profitto betransferred to P&LAccountdependsuponthestageofcompletionofthecontract*i.e.*,ratioofwork-in-progresscertifiedtototalcontractwork.Forthispurpose work-in-progressuncertified isnotconsidered.Prudence requiresthatthetotalnotionalprofitshouldnotbetransferredtoP&LAccountbutaportionofitshouldbewithheldasareser vetomeetanyunforeseenfutureexpensesorcontingencies.

Rules. Therearenohardandfastrulesinthisregard.However,thefollowinggeneralrulesmaybefollowed:

1. Whenwork-in-progresscertifiedislessthan25%ofthecontractprice,noprofitistransferred toProfitandLossAccount.Thisisbasedon theprinciple thatnoprofitshould betakenintoaccountunlessthecontracthasreasonablyadvanced.

2. When work-in-progresscertifiedis 25% - 5 0 % of thecontractprice,thengenerally1/3oftheprofitistransferredtoProfitandLossAccount.Thebalanceamountistreated asreserve.Thus,profitto betransferredto ProfitandLossAccountiscomputed bythefollowingformula:

Transfer to P & L A/C = Notional Profit X 1/3 X Cash Received/ Work certified

3. Whenworkcertifiedis a b o v e 50%ofthecontractprice,thentheprofittobetransferredtoP&LAccountiscomputedasfollows:

Transfer to P & L A/C = Notional Profit X 2/3 X Cash Received/ Work certified

4. When contractis nearcompletion then theestimated profitshould becalculated on thewholecontract.Theproportionofestimatedprofittobetransferredto ProfitandLossAccountiscomputedbyanyoneofthefollowingfor mulas:

Estimated profit = Work certified/ Contract price

Estimated profit = Work certified/ Contract price X Cash received/ Worked certified

Estimated profit = Cost of work to date/ Estimated total cost of work

Estimated profit = Cost of work to date/ Estimated total cost of work X Cash received/ Work certified

5. **Loss on Uncompleted Contracts.** In the event of aloss on uncompletedcontracts, thisshouldbetransferredinfullto theProfitandLossAccount,whateverbethestageofcompletionofthecontract.

Problem: 1 Thefollowingexpenditurewasincurredonacontractof`12,00,000fortheyearending31-12-2015.`

Materials	2,40,000	Wages	3,28
Plant	40,000	Overheads	17,200

Cashreceivedonaccountofthecontractto31stDec.,2015was`4,80,000,being80%oftheworkcertified.Thevalueofmat erialsinhandwas`20,000.Theplanthadundergone20%depreciation. PrepareContractAccount.

Solution:

ContractAccountfor the year ending 31st December, 2015

Particulars	`	*Particulars*	`
To Materials	2,40,000	ByMaterials in hand	20,000
ToWages	3,28,000	ByPlant in hand (40,000 less 20%)	32,000
ToPlant	40,000		
To Overheads	17,200	By Work-in-progress	
ToNotional Profit c/d	26,800	Workcertified 4,80,000 × 100/80	6,00,000
	6,52,000		6,52,000
ToProfit &Loss A/c (26,800×2/3 × 80%)	14,293	ByNotional Profit b/d	26,800
To Reserve	12,507		
	26,800		26,800

Problem2:

Thefollowingexpenseswereincurredonanunfinishedcontractduringtheyear2015.

Materials	` 90,000
Wages	` 60,000
Other expenses	` 30,000

`2,00,000wasreceivedbythecontractor,being80%oftheworkcertified.Workdonebutnotcertified was`5,000.Determinethe profitto be creditedto profitandlossaccountandprofitkeptreserveinallthethreealternativesgivenbelow:

(i) Contractpriceis `3,00,000

(ii) Contractpriceis `5,50,000

(iii) Contractpriceis `12,00,000

(iv)

Solution:

ContractAccountfor the year 2015

Particulars	`	*Particulars*	`
To Materials	90,000	ByWorkingProgress:Wo	
ToWages	60,000	rkcertified 2,00,000	2,50,000
ToOther expenses	30,000		
To Notional profit	75,000	00	5,000
	2,55,000	80 ByWork uncertified	2,55,000

Profitcreditedtoprofitandlossaccount:

(i) Whencontractpriceis`3,00,000,workcertifiedis 2,50,000/3,00,000 X100 = 83.33 of the contractprice.Asitismorethan50%ofthecontractprice,profitcreditedtoP&LA/cis

Notionalprofit ×2/3×80%

=75,000×2/3×80% =`40,000

Profitinreserve=`75,000–40,000 =`35,000

(ii) Whencontractpriceis5,50,000 workcertifiedis 2,50,000/5,50,000X100 =45.55 of the contractprice.Asitislessthan50%ofthecontractprice,profitcreditedtoP&LA/cis

Notionalprofit ×1/3×80%

=75,000×1/3×80% =`20,000

Profitinreserve=`75,000–20,000 =`55,000

(iii) Whencontractpriceis12,00,000workcertifiedis 2,50,000/12,00,000X100 =20.83. As itislessthan25%ofthecontractprice,noprofitiscreditedtoP&LA/candtheentireamountofnotionalprofitistob ekeptinreserve.

Problem : 3 Thefollowingweretheexpensesonacontractwhichcommencedon1stJanuary2015.

`

Materialspurchased	1,10,000
Materialattheend	1,250
Directwages	15,000
Plantissued	5,000
Directexpenses	8,000

The contractpricewas`1,50,000.Itwasduly received whenthe contractwascompletedon31-3-2015.Chargeindirectexpensesat15%onwagesand provide`1,000fordepreciationonplant. Preparethecontractaccountand contractee'saccount.

Solution

Contract Account for the year ending 31-12-201

Particulars	`	*Particulars*	`
To Materials	1,10,000	ByContractee's A/c (Contract price)	1,50,000
ToDirect wages	15,000	ByMaterials at the end	1,250
ToDirect expenses	8,000	ByPlant at the end (5,000 – 1,000)	4,000
ToIndirect expenses (15% on 15,000)	2,250		
ToPlant issued	5,000		
ToProfit and Loss A/c	15,000		
	1,55,250		1,55,250

Contractee's Account for the year ending 31-12-2015

Particulars	`	*Particulars*	`

ToContract A/c	1,50,000	ByBank	1,50,000
	1,50,000		1,50,000

Note: As the contract is fully completed, entire profit is transferred to profit and loss A/C

Problem:4

ModernContractorshaveundertakenthe followingtwocontractsonIstJanuary,2015:

	Contract A `	*ContractB* `
Materialssent to sites	85,349	73,267
Labourengaged on sites	74,375	68,523
Plantsinstalled at sites at cost	15,000	12,500
Direct expenditure	3,167	2,859
Establishment charges	4,126	3,852
Materialsreturned to store	549	632
Workcertified	1,95,000	1,45,000
Costof work not certified	4,500	3,000
Materialsin hand 31st Dec., 2015	1,883	1,736
Wagesaccrued 31st Dec., 2015	2,400	2,100
Directexpenditure accrued 31st Dec., 2015	240	180
Valueon plant 31st Dec., 2015	11,000	9,500

Thecontractpriceshavebeenagreedat `2,50,000forcontractAand`2,00,000for contractB.Cashhasbeenreceivedfromthecontracteesasfollows:ContractA`1,80,000andContractB`1,40,000.

PrepareContractAccounts,ContracteesAccountsandshowhowthework-in-progressshallappearintheBalanceSheetofthecontractor.

Solution: **Contract'A' Account for the year ending 31st Dec., 2015**

Particulars	`	*Particulars*		`.
ToMaterials sent to site	85,349	ByMaterials (returned to stores)		549
To Labour	74,375	ByMaterials in hand		1,883
ToPlant	15,000	ByPlant in hand		11,000
To Direct expenditure	3,167	By Work-in-progress:		
To Establishment charges	4,126	Work certified	1,95,000	
ToWages accrued	2,400	Work uncertified	4,500	
				1,99,500
ToDirect expenses accrued	240			
ToNotional Profit c/d	28,275			
	2,12,932			2,12,932
ToProfit &l.oss A/c	17,400*	ByNotional Profit b/d		28,275
28275 x 2/3 x 1,80,000/1,95,000				
ToBalance c/d (Reserve)	10,875			
	28,275			28,275

AContractee's Account

	Particulars	`		*Particulars*	`
2015			2015		
Dec.31	ToBalance c/d	1,80,000	Dec. 31	ByCash	1,80,000
		1,80,000			1,80,000
			2016		
			Jan.1	ByBalance b/d	1,80,000

Contract'B' Account for the year ending 31st Dec., 2015

Particulars	`.	*Particulars*	`.
To Materials	73,267	By Materialsreturned to store	632
To Labour	68,523	By Materialsin hand	1,736
To Plant	12,500	By Plantin hand	9,500

To Direct expenditure	2,859	By Work-in-progress:			
To Establishment charges	3,852	Workcertified	1,45,000		
To Wagesaccrued	2,100	Work uncertified	3,000	1,48,000	
To Direct expenditure accrued	180	By Losstransfer to P&L A/c		3,413	
	1,63,281			1,63,281	

B Contractee's Account

	Particulars	`		*Particulars*	`
2015			2015		
Dec.31	ToBalance c/d	1,40,000	Dec. 31	ByCash	1,40,000
		1,40,000			1,40,000
			2016		
			Jan.1	ByBalance b/d	1,40,000

BalanceSheet ason Dec. 31, 2015

Liabilities		`	*Assets*		`.
Wagesaccrued (2,400 + 2,100)		4,500	Plantless Depreciation (27,500 – 7,000)		20,500
Directexpenses accrued (240 + 180)		420	Materialsin hand		3,619
			Work-in-progress:		
Profit on contract A	17,400		**ContractA**		
Less: Loss on contract B	3,413	13,987	Work certified	1,95,000	
			Work uncertified	4,500	
			1,99,500		
			Less: Profit in reserve	10,875	
			1,88,625		
			Less: Cash received	1,80,000	8,625
			ContractB		
			Work certified	1,45,000	
			Work uncertified	3,000	
			1,48,000		
			Less: Cash received	1,40,000	8,000

Problem 5

T.K.ConstructionLtd.isengagedontwocontractsAandBduringtheyear.The followingparticularsareobtainedattheyear end(Dec. 31):

	Contract A	*ContractBS*
Dateof commencement	*April 1*	*eptember1*
Contract price	6,00,000	5,00,000
Materials issued	1,60,000	60,000
Materials returned	4,000	2,000
Materialson site (Dec. 31st)	22,000	8,000
Directlabour	1,50,000	42,000
Direct expneses	66,000	35,000
Establishment expenses	25,000	7,000
Plantinstalled at cost	80,000	70,000
Valueof plant (Dec. 31st)	65,000	64,000
Costof contact not yet certified	23,000	10,000
Valueof contract certified	4,20,000	1,35,000
Cashreceived from contractess	3,78,000	1,25,000
Architect's fees	2,000	1,000

Duringtheperiod,materialsamountingto`9,000havebeentransferredfromcontract AtocontractB.Youarerequiredtoshow:(*a*)ContractAccounts,(*b*)Contractees'Accounts,and ExtractsfromBalanceSheetasonDecember31st,clearlyshowingthecalculationofwork-in-progress.

Solution **Contract 'A' Account for the year ending 31st Dec.....**

Particulars	`	*Particulars*	`
ToMaterials usedTo	1,60,000	By Materials returned	4,000
Direct labourTo	1,50,000	ByMaterials transferred to B	9,000
	66,000	ByStock of materials	22,000

Direct expenses		25,000	By Work-in-Progress:		
ToEstablishmentexpensesTo		15,000	Work certified	4,20,000	
Depreciation on		2,000	Work uncertified	23,000	4,43,000
plantToArchitect'sfees		60,000			
ToBalance c/d (Notional Profit)		4,78,000			4,78,000
		36,000	ByBalance b/d		60,000
ToP&L A/c					
1,35,000×	2 / 3	8,80,000 / 1,10,000			
		24,000			
ToWIP A/c (Reserve)		60,000			60,000

Contract 'B' Account for the year ending 31st Dec.....

Particulars	`	*Particulars*		`
ToMaterials used	60,000	By Materials returned		2,000
ToMaterials from Contract A	9,000	ByStock materials		8,000
ToDirect labour	42,000	By Work-in-progress:		
ToDirect expenses	35,000	Work certified	1,35,000	
To Establishment expenses	7,000	Work uncertified	10,000	1,45,000
ToDepreciation on plant	6,000			
ToArchitect's fees	1,000	ByP&L A/c (Loss on contract)		5,000
	1,60,000			1,60,000

A Contractee's Account

Particulars	`	*Particulars*	`
ToBalance c/d	3,78,000	ByCash	3,78,000
		ByBalance b/d	3,78,000

A Contractee's Account

Particulars	`	*Particulars*	`
ToBalance c/d	1,25,000	ByCash	1,25,000
		ByBalance b/d	1,25,000

BalanceSheet (Extracts) as on 31st December .....

Liabilities		`	*Assets*		`
Profiton Contract A	36,000		Plant	1,50,000	
Less:Loss on Contract B	5,000	31,000	*Less*: Depreciation	21,000	1,29,000
			Stockof materials		
			ContractA	22,000	
			ContractB	8,000	30,000
			Work-in-progress:		
			ContractA		
			Workcertified	4,20,000	
			Work uncertified	23,000	
				4,43,000	
			*Less:*Reserve	24,000	
				4,19,000	
			*Less:*Cash received	3,78,000	41,000
			Work-in-progress:		
			ContractB		
			Workcertified	1,35,000	
			Work uncertified	10,000	
				1,45,000	
			*Less:*Cash received	1,25,000	20,000

UNIT- 2PROCESS-COSTING

Process costing is used where the production moves from one process to the next untilitsfinalcompletionandthereis acontinuous massproductionofidentical unitsthroughaseriesofprocessingoperations.ItisappliedforavariousindustrieslikeChemicalsandDrugs,OilRefining,FoodProcessing,Paintsandvarnish,Plastics,Soaps,Textiles,andPaperetc.

CIMAdefines process costingasfollows:"The costing method applicable where goods orservices result from a sequence of continuous or repetitive operations or processes. Costs areaveragedovertheunitsproduced duringtheperiod."

Processcostingmethodmayalsobeadoptedinfirmsthat,produce,avarietyofproducts, provided mat the overall production process can be broken down into sub-operationofacontinuousrepetitive naturelike automobiles,toy,plasticsetc.

FeaturesofProcessCosting:

1. The process cost centres are clearly defined and all costs relating to each process costcentreareaccumulated.
2. The cost and stock records for each process cost centre are maintained accurately. Therecords give clear picture of the unit's introduced in the process cost centre and alsounitspassedtothenextprocess.
3. The total costs of each process are averaged over the total production of that process,includingpartly completed units.
4. The charging of the cost of the output of one process as the raw materials input cost ofthefollowing process.
5. Appropriatemethodisusedinabsorptionofoverheadstotheprocesscostcentres.
6. Theprocesslossmayariseduetowastage,spoilage,evaporation,etc.
7. Sincethe production is continuous in nature, therewill beclosing work-in progresswhichmustbevalued separately.
8. The output from the process may be a single product, but there may also be a by-productsand/orJointproducts.

JOBCOSTINGVS.PROCESSCOSTING:

Sr	JobCosting	ProcessCosting
1	It is concerned with the cost of an individual Job orbatchregardlessofthetimetaken toproduce it.	It is impossible to identify individual Jobs andCosts are calculated on time basis for all unitsofoutputinthattime.
2	A job is carried out or a product is produced tomeetthespecificrequirementsoftheorder.Itmay be related to single unit or a batch of similarunits.	Alltheproductsareidenticalthereisacontinuous flow of production. It is applied toalargenumberofunits.
3	Standardisationofcontrolsiscomparativelydifficulta seachjobdiffersandmoredetailedsupervision and control isnecessary.	Proper control is relatively easy as there arestandard applied for costs, process loss, timeofproduction,etc.

4	CostsarecollectedtoeachJobattheendofitscompletion.	Costs are accumulated and collected tor eachprocessattheendofspecifiedaccountingperiodandtransferredtonextprocess/departmenttillthelastprocessiscompleted.
5	OnlyPrimeCostelementaretraceableandtheoverheads are apportioned to each Job on someappropriate basis and sometimes it is difficult toselectasuitablemethodofabsorptionofoverheadstoindividualJobs.	Process Costing system is easier to operatethan Job costing system because the detailedworkofallocatingcoststomanyindividualjob is unnecessary. Many of the costs that areindirectinaJobCostingsystemmayberegardedasdirectinprocesscostingsystem.
6	Work-in-processmayormaynotexistattheendofaccountingperiod.	Normally,therewillbeopeningandclosingwork-in-progressfortheaccountingperiod.
7	ThecostsofeachJobisascertainedbyaddingmaterials,labourandoverheads.	Theunitcostistheaveragecostoftheprocessforagiven period.
8	Itisaspecificordercosting.	Itisusedtoascertainthecostofaproductateach process.

PROCESSLOSSESANDGAINS

Normalloss:

The loss expected during the normal course of operations, for unavoidable reasons iscallednormallossandthisisduetoinherentresultoftheparticularprocessandthusuncontrollable in the short run. Management, overtime, are usually able to identify an averagepercentageofnormal lossesexpectedtoarisefrom theproductionprocess.

The normal losses are absorbed by the completed production. The cost of normal lossesshould be borne by the goods production. If any value can be recouped from sale of scrap orwastage or spoilage etc., then this would be credited to the process account thus reducing theoverall costoftheprocess.

JournalEntry:

NormallossA/c Dr

ToprocessaccountA/c

Abnormalloss: Abnormal tosses are those losses the level deemed to be the normal loss ratefor the process. The abnormal loss is the amount by which the actual loss exceeds the normalloss anditisexpectedtoarise underefficientoperatingconditions.

The abnormal losses are not included in the process costs but are removed from theappropriate process account and reported separately as an abnormal loss. The abnormal loss istreatedasaperiod costandwrittenofftotheprofitandlossaccountattheendoftheperiod.

AbnormalLoss(units)=Normaloutput-Actualoutput

JournalEntry:

Abnormal Lossa/c Dr xx
Toprocessa/ xx

Transfer:

Costingprofit &loss a/c .xx
To Abnormal loss A/c xx

CalculationofAbnormallossintermsofunit:

Abnormalloss=Normaloutput-Actualoutput

ValueofAbnormalLoss:

Amount(Rs)1000100

=NormalcostofNormalOutput/NormaloutputxUnitofAbnormalloss

Example: Input100unitsofRs.1000;Normaltoss10%scrapRs.100
Actualoutput87 units Calculate Abnormal loss

Answer:

	Unit	**Amount(Rs.)**
Input	100	1000
Less:Normalloss	10	100
Normaloutput	**90**	**(Normal cost)900**
Less:Actualoutput	87	---
Abnormalloss	**3**	---

Calculationof valueofAbnormalLoss:

Normalcost/NormaloutputxUnitofAbnormalloss=900/90x3=Rs.30

Dr	**Unit**	**Amount**	**Cr**	**Unit**	**Amount**
ToInput	100	1000	ByNormalloss	10	100
			Byabnormalloss	3	30
			Byactualoutput	87	(b.f.)870
	100	**1000**		**100**	**1000**

AbnormalGain:

IfthelossislessthantheNormalexpectedloss,thedifferenceisconsideredasabnormalgain.Abnormalgainisaccountedsinmartothatabnormalloss.Abnormalgainswillbe debited to the process account and credited to an abnormal gains accountthe abnormalgainaccountis debitedwiththefigureofreducednormallossinquantity andvalue.Attheend oftheaccountingyearthebalanceintheabnormalgainsaccountwillbecarriedtoProfitandLossAccount.

Calculationof valueof abnormal gain:
=Normal cost/NormaloutputxUnitofAbnormalgain.

JournalEntry:
Processa/cDr xx
Toabnormalgaina/c(Valueofabnormalgain)xx
Transfer:
Abnormalgain a/cDr.xx
TocostingprofitandLossa/cxx

Example:

Input	100units	=CostRs.1000
NormalLoss	10%;	ScrapRs,100
Actualoutput	95 units	CalculateAbnormalgain?

	Unit	**Amount(Rs.)**
Input	100	1000
Less: Normaltoss	10	100
Normaloutput	**90**	**Normalcost900**
Less:Actualoutput	95	---
Abnormalgain	5	---

CalculationofAbnormalgain:
Normalcost/ Normal Output xUnitofAbnormal= 900/ 90 x5= Rs.50/-

Dr	**Unit**	**Amount**	**Cr**	**Unit**	**Amount**
ToInput	100	1000	ByNormalloss	10	100
Toabnormalgain	5	50	ByActualoutput	95	(b.f.)950
	105	**1050**		**105**	**1050**

Problem:

Fromtheundermentionedfigurespreparepro cessaccountsindicatingthecostofeachprocessan dthe totalcost.Theproductionwas 480 articlesper week.

Particulars	**ProcessI**	**ProcessII**	**ProcessIII**
	Rs.	**Rs.**	**Rs.**
Material	3000	1000	400
Labour	1600	4000	1200
Factoryoverheads	520	1440	500

OfficeoverheadsamountingofRs1700shouldbeapportionedonthebasisofwages.Ignorestockinhand andwork-in-processatthebeginning and endofweek.

UNIT- 3 OPERATING COSTING

- **Introduction:** Operating Costing method is generally used in the service sector. It is a method of costing applied to undertakings which provide services rather than production of commodities. Service may be performed internally and externally. Services are termed as internal when they are performed on inter-departmental basis in factory itself *e.g.* power house services, canteen serviceetc.

  Services are termed as external when they are to be rendered to outside parties. Public utility services like transport, water supply, electricity supply, hospitals are the best example for the service costing. Thus operating costing is a method which is designed to determine the cost of services.

  Operating costing is just a variant of single or unit or output costing. So the principal of unit costing is used in operating costing. Operating costing is a method of ascertaining the cost of providing or operating a service. It is also known as service costing.

- **Units used in certainundertakings:**

  Determining the suitable cost unit to be used for cost ascertainment is a major problem in service costing. Selection of a proper cost unit is a difficult task. A proper unit of cost must be related with reference to nature of world and the cost objectives. The cost unit related must be simple i.e. per bed in a hospital, per cup of tea sold in a canteen and per child in a school. In a certain cases a composite unit is used i.e. Passenger – Kilometre in a transport company. The following are some of example of cost units used in different organizations

UNDERTAKINGS	COST UNIT
Goods transport	per tonne-kilo meter or per quintal kilometre
Railway or bus transport or passenger transport	per passenger-kilo meter
Electricity	per kilowatt-hour
Hospital	per patient, per bed occupied
Canteen	per meal, per tea, per thali, etc.
Water supply	per 1,000 litres or per 1,000 gallons

- In your syllabus there is only transportcosting.
- **Transport costing:** Transport costing is method of ascertaining the cost of providing service by a transport undertaking. This includes air, water, road and railways; motor transport includes private cars, carriers for owners, buses, taxies, carrier Lorries etc. The objective of motor transport costing may be summarized asfollows:
  - to ascertain the operation cost of running avehicle
  - to provide and accurate basis for quotation and fixing ofrates

- to provide cost companion between own transport and alternative *e.g.*hiring
- to compare the cost of monitoring one group of vehicle with anothergroup
- to determine the cost to be changed against departments using theservice
- to ensure the cost of maintenance and repairs is notexcessive

- **Round trip:** Round trip means—to andfro.
- **Freightage:** The rate/price which is charged from the customer is called freightage (in case of goods transport/carriage). It can be assumed as a sellingprice.
- **Taking:** The rate/price which is charged from the customer is called taking. It can be assumed as a selling price. When the commission/profit is given as a percentage of taking then this means that commission/profit is given as a percentage of sales.
- Abnormal losses shall be excluded while ascertaining thecost.
- Fine/penalty paid due to the violation of traffic rules shall not be added to thecost.
- **Wages of driver/conductor/cleaner:** If given on the basis of hours or kilometres then these are variable otherwise in all other cases these arefixed.
- **Depreciation:** Depreciation is a variable expense unless otherwisespecified.
- **Passenger kilometres:** Passenger kilometres are always calculated using absolute method. Formula is asfollows:
- **Calculation of Cost Per Unit:** In order to calculate the cost per unit, divide the total cost by the number of units. *e.g.* Total cost is 50,000 and Passenger KMs are 5,00,000. The cost per passenger KM would be Rs. 0.10 (Rs. 50,000 / 5,00,000 Passenger KMs). Then add the profit to the cost per unit (or total cost) in accordance of the information given in thequestion.
- **Costs are classified into the following threeheads:**
- **Standing or Fixed Charges:** These charges are included while ascertaining the cost whether or not the vehicle is operating. Insurance, tax, depreciation, part of driver wages, interest on capital, general supervision, and salary of operating managers are items which come under the category of fixed or standingcharges.
- **Maintenance charges:** There are semi variable expenses in nature. Wear on tyres, repairs and overheads, painting etc. come under the category of maintenancecharges.
- **Operating and running charges:** Running costs are the cost of operations. These charges vary more or less in direct proportion to kilometres. These expenses are variable in nature because they are dependent on distance covered and tripsmade.

  Though the above three classification is there but in practical life it is difficult to divide these expenses in these categories. It depends basically on the circumstances of each case *e.g.* if the salary paid to driver is on monthly basis then it is a fixed charged but if the same is limited to kilometre run or hours then it is a running cost.

Format of the Operating Cost Sheet

OPERATING COST SHEET		
VehicleNumber:DL1T5689	**For the Month/Quarter/Year**	
Passenger KMs_____	**KMs/Tonnes KMs/Quintal**	
Particulars	**TotalAmount (Rs.)**	**Cost PerPassenger KM /Cost Per TonneKM / Cost PerQuintal KM (Rs.)**
FIXED CHARGES/STANDING CHARGES:		
• Wages of drivers, conductors, cleaners, foreman,etc.		
• Salaries of office and supervisory staff, accountant,etc.		
• Taxation, insurance, road tax, license fee, etc.		
• Interest and othercharges		
• Heating andlighting		
• Cooliewages		
• Generaloverheads		
• Garagerent/charges/overheads		
• Other fixed overheads,expenses		
• Directorfees		
• Stationery		
• Interest on capital (may be included treating as a notionalexpense)		
TOTAL STANDING CHARGES		
VARIABLE OVERHEADS/RUNNING CHARGES/RUNNING AND MAINTENANCE OVERHEADS:		
• Repair andmaintenance		
• Diesel, petrol, other oils, etc.		
• Lubricating oil		
• Depreciation		
• Tyreallocation		
• Commission to driver orconductor		
TOTAL VARIABLE OVERHEADS/RUNNING CHARGES		
TOTAL COST (FIXED/STANDING + VARIABLE/RUNNING) AND COSTPER PASSENGER/TONNEKM		

EXAMPLE

Varun Limited is running four buses between Delhi and Alwar, covering a distance of 100 KMs. The seating capacity of each bus is 40 passengers. The following particulars are obtained from its books for the month of October2009:

Wages of driversandconductors	Rs.9,600
Salaries ofofficestaff	Rs.3,000
Honorariumofaccountant	Rs.1,000
Diesel,oiletc.	Rs.16,000
Repairandmaintenance	Rs.3,200
Road taxandinsurance	Rs.6,400
Depreciation	Rs.10,400
Interest andothercharges	Rs.8,000

Actual passengers carried were 75% of the seating capacity. All the buses ran for 30 days. Each bus made one

round trip per day. Find out the fare the company should charge per passenger KM if it wants a profit of 20% on the taking.

OPERATING COST SHEET		
VehicleNumber:DL1T5689	**For the monthOctober2009Passenger KMs:7,20,000**	
Particulars	**Total Amount (Rs.)**	**Cost Per Passenger KM(Rs.)**
FIXED CHARGES/STANDING CHARGES:		
Wages of drivers and conductors	9,600	
Salaries of office staff	3,000	
Honorarium of accountant	1,000	
Road tax and insurance	6,400	
Interest and other charges	8,000	
TOTAL STANDING CHARGES	**28,000**	**0.039**
VARIABLE OVERHEADS/RUNNING CHARGES/RUNNING AND MAINTENANCE OVERHEADS:		
Diesel, oil, etc.	16,000	
Repair and maintenance	3,200	
Depreciation	10,400	
TOTAL VARIABLE OVERHEADS/RUNNING CHARGES	**29,600**	**0.041**
TOTAL COST (STANDING + RUNNING) AND COST PER PASSENGER KM	**57,600**	**0.080**
Add: Profit (20% of Taking *i.e.* Selling Price)=Cost □ % / (100-%) = 0.080 □ 20 / (100-20)	**14,400**	**0.020**
TOTAL FARE AND FARE (TAKING) THE COMPANY SHOULD CHARGE PER PASSENGER KM	**72,000**	**0.100**

PROBLEM

From the following information calculate the cost of running a taxi per kilometer:

Number of taxi	10	Cost of each taxi	Rs. 2,00,000
Salary of manager	Rs. 6,000 P.M	Salary of Accountant	Rs. 5,000 P.M
Salary of cleaner	Rs. 2,000P.M	Salary of Machanic	Rs. 4,000 P.M
Garage rent	Rs. 6,000 P.M	Insurance premium	5% p.a
Annual Tax	Rs. 6000 per taxi	Driver salary	Rs. 2,000 p.m per taxi
Annual repair	Rs. 10,000 per taxi		

Total life of a taxi is about 2,00,000 kms. A taxi runs in all 3,000 k.m. in a month of which 30% it runs empty. Petrol consumption is one litre for 10 k.m. at Rs.18 per litre. Oil and sundries are Rs. 50 per 100 kms.

Operating cost sheet for cost of running a taxi per kilometer

	Per month	Per K.m

PROBLEM

The road transport company which keeps a fleet of lorries shows the following information:

Kms runs in April	30,000
Wages for April	2,000
Petrol,oil for April	4,000
Original cost of vehicle	1,00,000

Depreciation to be allowed at 25% p.a on original cost.

Repairs for the month of April	6,000
Garage rent for April	1,000
License, Insurance for the year	6,000

Prepare operating cost sheet for April showing the fixed cost, variable and total cost per running kilometre

UNIT- 4

MARGINALCOSTINGANDBREAK-EVENANALYSIS

DefinitionsofMarginalcostandMarginalcosting

AccordingtotheTerminologyofCostAccountancyoftheInstituteofCostandManagement Accountants, London, Marginal Cost represents "the amount of any given volumeof outputbywhich aggregatecostsare changed ifthevolumeofoutputisincreasedbyoneunit.

Marginal cost may also be defined as "the aggregate of variable costs" or "prime costplusvariableoverheads".

Thus, if for the production of 1,000 units of a product the manufacturer has to incur Rs. 75,000formaterials, Rs. 50,000fordirect wages, Rs. 25,000forvariableoverheads andRs. 50,000fixedoverheads,the marginal costcanbeascertained asfollows:

	Total(1,000units)Rs.	Per unit Rs.
Directmaterials	75,000	75
DirectWages	50,000	50
PrimeCost	1,25,000	125
VariableOverheads	25,000	25
MarginalCost	1,50,000	150

MARGINALCOSTING

TheInstituteofCostandManagementAccountants,London,hasdefinedMarginalCosting as "the ascertainment of marginal costs and of the effect on profit of changes in volumeor type ofoutputbydifferentiatingbetweenfixed costsandvariablecosts.

BASICCHARACTERISTICSOFMARGINALCOSTING

1. Thestocksoffinishedgoodsandwork-in-processarevaluedatmarginalcostsonly.
2. It is a technique of analysis and presentation of costs which help management in takingmany managerial decisions; and is not an independent system of costing such as processcostingorjobcosting.
3. Thevariablecosts(marginalcosts)areregardedasthecostsoftheproducts.
4. All elements of cost production, administration and selling and distribution are classifiedintovariableandfixed component.
5. Fixedcostsaretreatedasperiodcosts.

ASSUMPTIONSOFMARGINALCOSTING

1. Thevolumeofproductionoroutputistheonlyfactorwhichinfluencesthecosts.
2. All elements of cost production, administration and selling and distribution— can besegregated intofixed andvariablecomponents.
3. Thesellingpriceperunitremainsunchanged orconstantatalllevelsof activity.
4. Variablecostremainsconstantperunitofoutputirrespectiveofthelevelofoutputandthusfluctuat esdirectlyin proportionto changesin the volumeof output.
5. Fixedcostsremainunchangedorconstantfortheentirevolumeofproduction.

MARGINALCOSTINGVsDIRECT/DIFFERENTIAL/VARIABLECOSTING

Thetermmarginalcostingisalsoreferredtoas'variablecosting','directcosting','differentialcosting'orincremental costing.

MARGINALCOSTINGVsABSORPTIONCOSTINGORFULLCOSTING

1. bsorptioncostingisthetotalcosttechnique.Underabsorptioncostingallcostswhether variable or fixed are treated as product costs. In marginal costing techniqueonlyvariablecosts aretreated asproductcosts.
2. Inabsorptioncostingarbitraryapportionmentoffixedcosts,overtheproducts,resultsin under or over-absorption of such costs. While marginal costing excludes fixed costsandthe questionofunder oroverabsorptionoffixedcostsdoesnot arise.
3. Absorption costing differs from marginal costing from the point of view of inventoryvaluation also. In absorption costing, the stock of finished goods and work-in-process isvalued at total cost which includes both variable and fixed cost. In marginal costing, suchstocksarevalued atmarginal cost.
4. In absorption costing, managerial decision-making is based upon 'profit' which is theexcess of sales value over total cost. While in marginal costing, the managerial decisionsareguidedby'contribution'whichistheexcessof salesvalueovervariable cost.

CONTRIBUTION:

Contributionisthedifferencebetweensalesandvariablecostormarginalcostofsales.It may also be defined as the excess of selling price over variable cost per unit. Contribution isalso known as Contribution Margin or Gross Margin. Contribution being the excess of sales overvariable cost isthe amountthat iscontributedtowardsfixedexpensesand profit

IfthesellingpriceofaproductisRs.20/-perunitanditsvariablecostisRs.15/-perunitcontributionperunitis Rs.5/-(i.e. Rs.20-15.

Contribution=Sales-Variable(Marginal)Cost

OrContributionperunit=SellingPrice-Variable(ormarginal)costperunitorContribution=Fixed Costs+Profit(—Loss)

Advantagesofcontribution:

- Ithelpsthemanagementindecidingwhethertopurchaseormanufactureaproductoracomponent
- Ithelpsthemanagementinthefixationofsellingprices.Itassistsindeterminingthebreak-even point
- Ithelpsintakingadecision asregardsto addinganew productinthemarket.
- Ithelpsmanagementintheselectionofasuitableproductmixforprofitmaximisation.
- Ithelpsinchoosingfromamongalternativemethodsofproduction;themethodwhichgives highestcontributionper limitingfactorisadopted.

MarginalCostEquation:

Sales - Variable cost=Contribution
or,Sales=Variablecost+Contributionor,
Sales = Variable cost + Fixed Cost ± Profit/Loss
or,Sales-Variable cost=Fixed cost ± Profit/Lossor,S-V =F±P
Where 'S' stands for SalesV‘stands for Variable costF‘standsfor Fixed cost
P‘standsforProfit/Loss

Determinetheamountofvariablecostfromthefollowingparticulars:

Sales	150000
FixedCost	30000.
Profit	40000

Solution:
Sales -Variable cost = Fixed Cost ± Profit / Loss
or150000-V.C.=30,000+40,000or
Variablecost=1,50,000-70,000 =Rs.80,000.

Illustration: Fromthefollowinginformationfindouttheamountofprofitearnedduringtheyear usingthemarginalcostingtechnique:

FixedCost	Rs.250000
Variablecost	Rs.10 per unit
Sellingprice	Rs.15 per unit
Outputlevel	75000 units

Solution:
S-V =F+P
Sales= Rs.75,000x15 =Rs.11, 25,000
VariableCost=75,000x10= Rs.7,50,000

Fixed Cost =Rs. 2, 50,000Profit(P) =?
11,25,000-7,50,000= 2,50,000+P
3,75,000 =2,50,000+P P
= 3,75,000-2,50.000
Profit=Rs.1,25,000.

Profit/VolumeRatio(P/VratioorC/SRatio
TheProfit/volumeratio,whichisalsocalledthe'contributionratio'or'marginalratio',expressestherelation ofcontributiontosales and canbeexpressedasunder:

P/V Ratio= Contribution/ Sales

P/VRatio=Sales-Variablecost/Salesi.e. S-V \ S
or,P/V Ratio= Fixed cost+ Profit/Salesor,
P/V Ratio = Change in profit or Contribute / Change in SalesP/VRatio=20 –15/20xl00=5/20xl00= 25%

The PA/ ratio, which establishes the relationship between contribution and sales is of vitalimportance for studying the profitability of operations of a business. It reveals the effect onprofitofchangesinthevolume.

Theformulaforthesalesvolumesrequiredtoearnagivenprofitis:
P/V Ratio= Contribution/Sales
or,P/V Ratio=Fixed Cost+Profit/Sales
or,Sales= Fixed cost+Profit/P/VRatio= F+P/P/V Ratio

Illustration:

Sales	Rs.100000
Profit	Rs.10000
Variablecost	70%

Find out (i) PA/ ratio, (ii) Fixed Cost (iii) Sales Volume to earn a Profit of Rs. 40000Sales=Rs.100000
Variablecost= 70% = 70 / 100 x 100000 = Rs. 70000P/V Ratio= sales– variable cost/ salesx100
= 100000–70000/100000 x100=30%
Contribution = Fixed cost + profit30000 =fixedcost+ 10000
=Rs.20000
Fixedcost=30000- 10000
Sales=Fixedcost +profit/P/VRatio
= 20000+40000 /30%
= 60000x100/30=Rs.200000

Illustration:

Thesalesturnoverandprofitduringtwoyearswereasfollows:

Year	**SalesRs.**	**ProfitRs.**
2015	140000	15000
2016	160000	20000

Youarerequiredtocalculate:

a) P/V ratio
b) Salesrequiredtoearnaprofitof Rs.40,000,
c) Profitwhen salesareRs.1, 20,000.

Solution:

a) P/VRatio=ChangeProfit/ChangeinSalesx100
= 5000/20000 =100=25%

b) Sales required to earn a profit of Rs. 40,000P/VRatio= Fixed cost +profit/ Salesor
25/100=F+15,000/1,40,000or
140000 x25/100 =F+15000 =35000 – 15000 =F or
Fixed cost = Rs. 20000 orFixed Cost =Rs. 20,000DesiredSales=F+P/ P/VRatio
= 20000+40000/25/100=60000x100/25=Rs.240000

c) Profit when sales are Rs. 1,20,000S=F+P/P/VRatio

SxP/Vratio=F+P

1,20,000x25/100=20,000+P

30,000 =20,000+P

Profit =30,000-20,000=Rs.10,000

COST-VOLUME&PROFITANALYSIS

Cost-Volume-Profit Analysis a technique for studying the relationship between cost,volume and profit. Profits of an undertaking depend upon a large number of factors. The CVPrelationship is an important tool used for the profit planning of a business.In cost-volume-profit analysis an attempt is made to analyse the relationship between variations in cost withvariationsinvolume.

The cost-volume-profit relationship is of immense utility to management as it assists inprofit planning, cost control and decision making. Cost-volume-profit analysis can be used toanswerquestions suchas:

1. Howmuchsalesshouldbemadetoavoidlosses?
2. Howmuchshouldbethesalestoearnadesiredprofit?
3. Whatwillbethe effectof change inprices,costsand volumeonprofits?
4. Whichproductorproductmixismostprofitable?
5. Shouldwemanufactureorbuysomeproductorcomponent?Andsoon.

BREAK-EVENANALYSIS

Thestudyofcost-volumeprofitanalysisisoftenreferredtoas break-evenanalyses.The term "break-even analysis" is used in two senses. In its broad sense, break-even analysisreferstothestudyofrelationshipbetweencosts,volumeandprofitatdifferentlevelsofsalesorproduction.Initsnarrowsense,itreferstoatechniqueofdeterminingthatlevelofoperationswheretotalrevenuesequaltotalexpenses,i.e.,thepointof noprofit,noloss.

ASSUMPTIONSOFBREAK-EVENANALYSIS

1. Thebreak-evenanalysisisbaseduponthefollowingassumptions:
2. Allelementsofcost,i.e.,production,administrationandsellinganddistributioncanbesegregated intofixed andvariablecomponents.
3. Sellingpriceperunitremainsunchangedor constantatalllevelsofoutput.
4. Thereisonlyoneproductorincaseofmulti-products,thesalesmixremainsunchanged.
5. Variablecostremainsconstantperunitofoutputirrespectiveofthelevelofoutputandthusfluctuatesdirectlyin proportionto changesin thevolumeof output.
6. Therewillbeno changein the generalprice-level.
7. Fixedcostremainsconstantatallvolumesofoutput.
8. Volumeofproductionistheonlyfactorthatinfluencescost.
9. Thereissynchronisationbetweenproductionandsales.

BREAKEVENPOINT

The break-evenpoint maybe defined asthat pointofsalesvolume atwhich totalrevenue is equal to total cost it is a point of no profit no loss. A business is said to break-evenwhen its total sales are equal to its total costs.At this point contribution, i.e., sales minusmarginalcostequalsthefixedcostsandhencethispointisoftencalledasCriticalPointorEquilibriumPointorBalancingPointornoprofitnoloss.Ifproduction/salesareincreased

beyondthislevel,thereshallbeprofittotheorganisationandifitisdecreasefromthislevel,there shallbelosstotheorganisation.

Break-evenpointcanbestatedintheformofanequation:

Salesrevenueatbreak-evenpoint=FixedCosts+VariableCosts.

ALGEBRAICFORMULAMETHODFORCOMPUTINGTHEBREAKEVENPOINT

Thebreak-evenpointcanbecomputedintermsof:

a. Unitsofsales volume.
b. Budgettotalor intermsofmoneyvalue.
c. Asapercentageofestimatedcapacity.

(a) Break-EvenPointinUnits:

Asthebreak-evenpointisthepointofnoprofitnoloss,itisthatlevelofoutputatwhich the total contribution equals the total fixed costs, it can be calculated with the help offollowingformula:

BreakEvenPoint =FixedCost/SellingPriceperunit-VariableCostperunit
=FixedCost/Contributionperunit

(b) Break-EvenPointintermsofbudget-totalormoneyvalue:

Atbreak-evenpoint:

TotalSales=TotalFixedCost+TotalVariableCostor S= F+V(Where S=Sales, F=FixedCostand V=Variablecost)

Break-EvenSales=FixedCost/Sales-VariableCostxSales
=Fixed Cost/ContributionxSales

With the use of P/V Ratio, B.E.P = Fixed cost / P/V Ratio(As,contribution /sales= P/VRatio)

MARGINOFSAFETY

Theexcessofactualor budgetedsalesoverthe break-evensalesisknownasthemarginofsafety.It isthedifference betweenactual salesminusthe sales atbreak-evenpoint.

Margin of Safety=Total Sales - Sales at Break - Even

PointMarginofSafety(M/S)=Profit/P/VRatio

ANGLEOFINCIDENCE

The angle of incidence is the angle between the sales line and the total cost line formedat the breakeven point where the sales line and the total cost line intersect each other. Theangle of incidence indicates the profit earning capacity of a business. A large angle of incidenceindicates a high rate of profit and, on the other hand, a small angle of incidence indicates a lowrateofprofit.

MANAGERIALAPPLICATIONSOFMARGINALCOSTING

(DecisionsInvolvingAlternativeChoices)

Marginal costing technique is a valuable aid to management in taking" many managerialdecisions.Itisausefultoolformakingpolicydecisions,profitplanningandcostcontrol.The

following are some of theimportant managerialproblems where marginalcosting techniquecan beapplied.

1. PricingDecisions.
2. ProfitPlanningandMaintainingaDesiredLevelofProfit.
3. MakeorBuyDecisions.
4. ProblemsofKeyorLimitingFactor.
5. SelectionofaSuitableorProfitableSalesMix.
6. EffectofChangesinSalesPrice.
7. AlternativeMethodsofProduction.
8. DeterminationofOptimumLevelofActivity.
9. EvaluationofPerformance.
10. CapitalInvestmentDecisions.

PRICINGDECISIONS

Fixing of selling prices is one of the most important functions of management. Althoughprices are generally determined by market conditions and other economic factors yet marginalcostingtechniqueassiststhemanagementinthefixationofsellingpricesundervariouscircumstances as:

a) Pricingundernormalconditions
b) Duringstiffcompetition
c) Duringtradedepression.

ProfitPlanningandMaintainingaDesiredLevelofProfit

Marginal costing techniques can be applied for profit planning as well. Profit planninginvolves the planning of future operations to achieve maximum profits or to maintain a desiredlevel ofprofits.

MakeorBuyDecisions:

Sometimesaconcernhastodecidewhetheracertainproductoracomponentshouldbemadeinthefactoryitself(havingunusedproductionfacilities)orboughtfromoutsidefroma firm which specialises in it. In taking such a 'make or buy' decision, the technique of marginalcostingisofimmensehelp.
MaterialsDirec
tlabour
OtherVariableExpenses

DepreciationandotherFixedExpensesSolution:

Since fixed costs are to be incurred whether we manufacture this component or not thedecision depends upon the marginal cost of making the component which is calculated asfollows:

MarginalCostofComponent0.51(perunit)	Rs.
Materials	3.00
DirectLabour	2.00
OtherVariableExpenses	-

Itisadvisabletomakethecomponentitselfifthemarginalcostofmakingthecomponent is lower than the purchase price because every component produced will give somecontributiontothecompany.Butincasethemarginalcostishigherthanthepurchaseprice,itisbetterto buy thecomponentfromoutsidethanto makeit

In the above example, if the purchase price is Rs. 6.50, it is not advisable to buy thecomponent from outside. We should rather make the component of our own because everycomponent manufactured will give a contribution of 50 paise. But the company should notmanufacture the component if it is available at Rs. 5.50 from outside. In that case it is better tobuythantomake.

ProblemofKeyorLimitingFactor:

A limiting factor is a factor which limits or restricts production or sales and thus preventsaconcernfrommaking unlimitedprofits.Limitingfactoris alsoknownaskeyfactor.Thelimiting factor may be any factor of production such as availability of raw material, labour,capital,plantcapacity andevensales.

EffectofChangesinSalesPrice:

Managementisgenerallyconfrontedwithaproblemofanalysingtheeffectofchangesin sales price upon the profitability of the concern. It may be required to reduce the prices onaccountofcompetition,depression.

AlternativeMethodsofProduction:

Sometimes the management has to choose from among alternative methods of production, e.g.,machine work or hand work. The same product may be produced either by employing machineNo. 1 or Machine No. 2, and the management may be confronted with the problem of choosingone among them. In such circumstances, technique of marginal costing can be applied and themethod which gives the highest contribution can be adopted keeping in view, of course, thelimitingfactor.

EvaluationofPerformance:

Evaluation of performance efficiency of various departments, product lines or marketscan alsobemadewiththe useofthetechniqueofmanagerial costing.

CapitalInvestmentDecisions:

Thetechniqueofmarginalcostingalsohelpsthemanagementintakingcapitalinvestmentdecisions.

ADVANTAGESOFMARGINALCOSTING:

- Thetechniqueofmarginalcostingisverysimpletooperateandeasytounderstand.
- Itdoesawaywiththeneedforallocation,apportionmentandabsorptionoffixedoverheadsandhenceremovesthecomplexitiesofunderabsorptionofoverheads.
- Marginalcostremainsthesameperunitofoutputirrespectiveofthelevelofactivity.Itisconstantinnatureandhelpsthemanagementin production planning.
- Thereisnopossibilityoffactitiousprofitsbyover-valuingstocks.
- Itfacilitatesthecalculationofvariousimportantfactors.
- Itisavaluableaidtomanagementfordecision-makingandfixationofsellingprices,selectionofaprofitableproduct/salesmix.
- Itfacilitatesthestudyofrelativeprofitabilityofdifferentproductlines,departments.
- Itiscomplimentarytostandardcostingandbudgetarycontrol.

- Helpincost control
- Ithelpsthemanagementinprofitplanning.
- Itisveryusefulinmanagementreporting

LIMITATIONSORDISADVANTAGESOFMARGINALCOSTING

- Thetechniqueofmarginalpostingisbaseduponanumberofassumptionswhichma ynotholdgoodunderall circumstances.
- Allcostsarenotdivisibleintofixed andvariable.
- Variablecostsdonotalwaysremainconstant.
- Sellingpricesdonotremainconstant.
- Fixedcostsdonotremainconstantafteracertainlevelofactivity
- The exclusion of fixed costs from the stocks of finished goods and workin-progress isillogical.
- Although the technique of marginal costing overcomes the problem of under or over-absorptionoffixedoverheads,theproblemstillexistsinregardtounderorover-absorption ofvariableoverheads.
- Marginalcostingcompletelyignoresthetimefactor.
- Thetechniqueofmarginalcostingcannotbeapplied incontractorshipbuildingindustry.
- Costcontrolcanbebetterbeachievedwiththehelpofothertechniques,viz.,standar dcostingandbudgetarycontrolthanby marginalcostingtechnique.
- Fixationofsellingpricesinthelongruncannotbedonewithoutconsideringfixedc osts.Thus,pricingdecisions cannotbe basedonmarginal cost alone.
- Managerialdecisionsbaseduponlythemarginalcostignoringequallyimportant element offixed costmay notbecorrect.

UNIT- 5STANDARD COSTING

Costcontrolisabasicobjectiveofcostaccountancy.Standardcostingisthemostpowerfulsysteme ver invented for cost control.

Historical costing or actual costing is nothing but, a record of what happened in the past. Itdoes not provide any 'Norms' or 'Yardsticks' for cost control. The actual costs lose theirrelevance after that particular accounting period. But, it is necessary to plan the costs, todetermine whatshould be the cost of a product or service. It the actual costs do notconform to what the costs should be, the reasons for the change should be assessed andappropriateactionshouldbeinitiated to eliminate the causes.

Standard costing fulfills the need to compensate the short comings of Historical costingfromthepointofviewofcostcontrol.(a)Itprovidesthenormsoryardsticksintheformof standards- specifying what costs should be or yardsticks in the form of standards- specifying what cost should be (b) comparison of actual costs with standards is facilitatedto ascertain variances for each element of cost. (c) The variances are further analysed
forcontributoryreasons.Responsibilityisfixedonthebasisofthereasonsforeachvariance.
(a) Corrective measures are under taken to eliminate the unfavourable variances whereverpossible.

Thus, standard costing is a costing technique specifically evolved to provide complete'Infrastructure'and'Systematic approach'forcostcontrol.

DEFINITION:STANDARD,STANDARDCOST,STANDARDCOSTING

Standard. According to Prof. Eric L.Kohler, "Standard is a desired attainable objective, aperformance,agoal,amodel".Standardmaybeusedtoapredeterminedrateorapredetermineda mount or a predetermined cost.

Standard Cost: Standard cost is predetermined cost or forecast estimate of cost. I.C.M.A.Terminology defines Standard Cost as, "a predetermined cost, which is calculated frommanagement standards of efficient operations and the relevant necessary expenditure. Itmay be used asabasis for price-fixing and for cost control through variance analysis".The other names for standard costs are predetermined costs, budgeted costs, projectedcosts,modelcosts,measuredcosts,specificationscostsetc.Standardcostisa

predetermined estimate of cost to manufacture a single unit or a number of units of aproductduringafutureperiod.Actualcostsarecomparedwiththesestandardcosts.

Standard Costing is defined by I.C.M.A. Terminology as, "The preparation and use ofstandard costs, their comparison with actual costs and the analysis of variances to theircausesand points of incidence".

"Standard costing is a method of ascertaining the costs whereby statistics are prepared toshow (a) the standard cost (b) the actual cost (c) the difference between these costs, whichistermedthevariance"saysWheldon.Thusthetechniqueofstandardcoststudycompriseso f:

1. Pre-determinationof standardcosts;
2. Useof standard costs;
3. Comparisonofactualcostwiththestandardcosts;
4. Findoutandanalysereasonsforvariances;
5. Reportingtomanagementforproperactiontomaximizeefficiency.

ADVANTAGESOFSTANDARDCOSTING

Costcontrol:

Standardcostingisuniversallyrecognizedasapowerfulcostcontrolsystem.Controllingandredu cingcosts becomesa systematicpracticeunderstandardcosting.

Eliminationofwastageandinefficiency:

Wastage and inefficiency in all aspects of the manufacturing process are curtailed, reducedandeliminatedoveraperiodoftimeifstandardcostingisincontinuousoperation.

Norms:

Standardcostingprovidesthenormsandyardstickswithwhichtheactualperformancecanbe measured and assessed.

Locatessourcesofinefficiency:

Itpinpointstheareaswhereoperationalinefficiencyexists.Italsomeasurestheextentofthe inefficiency.

Fixingresponsibility:

Varianceanalysiscandeterminethepersonsresponsibleforeachvariance.Shiftingorevadingresponsibi lityisnoteasyunderthissystem.

Managementbyexception:

Theprincipleof'managementbyexceptioncanbeeasilyfollowedbecauseproblemareasarehighl ightedbynegativevariances.

Improvementinmethodsandoperations:

Standards are set on the basis of systematic study of the methods and operations. As aconsequence,costreduction ispossiblethrough improvedmethodsandoperations.

Guidancefor production and pricing policies:

Standardsarevaluableguidestothemanagementintheformulationofpricingpoliciesandproduct iondecisions.

Planningand Budgeting:

Budgetarycontrolisfarmoreeffectiveinconjunctionwithstandardcosting.Beingpredetermined costs on scientific basis, standard costs are also useful in planning theoperations.

Inventoryvaluation:

Valuationofstocks becomesa simple processbyvaluingthematstandardcost.

LIMITATIONOFSTANDARDCOSTING

1. Itiscostly,asthesettingofstandardsneedshightechnicalskill.
2. Keeping ofup-to-date standardis aproblem.Periodicrevisionofstandardisacostlything.
3. Inefficientstaffisincapableofoperatingthissystem.
4. Sinceitisdifficulttosetcorrectstandards,itisdifficulttoascertaincorrectvariance.
5. Industries, which are subject to frequent changes in technological process or thequality of material or the character of labour, need a constant revision of standard.Butrevisionofstandardismoreexpensive.
6. Forsmallconcerns,standardcostingisexpensive.

APPLICABILITYOFSTANDARDCOSTING

Standard Costing is a control device. It is not a separate method of product costing. Anyactivityofrecurringnatureissusceptibleforsettingstandards.Thestandard-costprocessis mostly used to control the operating tasks. Manufacturing activities are routine andfrequentandthereforeeasyforestablishingstandards.

Industries where standardized and uniform work of repetitive nature is done are suitablefor introduction of standard costing. Standard costing system is of little use or no usewhereworks vary formjob to joborcontracttocontract.

SETTINGTHESTANDARDS

While setting standard cost for operations, process or product, the following preliminariesmust be gone through:

i) TheremustbeStandardCommittee,similartoBudgetCommittee,inwhichPurchase Manager, Personnel Manger, and Production Manager are represented. TheCostAccountantcoordinatesthefunctionsoftheStandardCommittee.

ii) Study the existing costing system, cost records and forms in use. If necessary, reviewtheexistingsystem.

iii) A technical survey of the existing methods of production should be undertaken sothataccurate and reliablestandards canbeestablished.

iv) Determinethe type of standardto be used.

v) Fixstandardfor each element of cost.

vi) Determinestandardcostsforeachproduct.

vii) Fixtheresponsibilityforsettingstandards.

viii) Classifytheaccountsproperlysothatvariancesmaybeaccountedforinthemannerdesired.

ix) Comparisonofactualcostswithpre-determinedstandardstoascertainthedeviations.

x) Actiontobe takenby managementto ensurethatadverse variancesare notrepeated.

INTRODUCTIONOFSTANDARDCOSTINGSYSTEM

Introducingstandardcostinginanyestablishmentrequiresthefulfillmentoffollowingpreliminaries.

1. Establishmentof costcentres;
2. Classification and codification of accounts;
3. Determiningthe typesofstandards andtheir basis;
4. Determiningtheexpectedlevelofactivity;
5. Setting standards

Establishmentof cost centres

Acostcentreisalocation,personoritemofequipmentforwhichcostsmaybeascertained and used for the purpose of cost control. The cost centres divide an entireorganisationintoconvenientpartsforcostingpurpose.Thenatureof productionandoperations, the organisational structure, etc. influence the process of establishing costcentres. No hard and fast rule can be laid down in this regard. Establishment of the costcentresisessentialforpinpointingresponsibilityforvariances.

Classificationandcodification ofaccounts

The need for quick collection and analysis of cost information necessitates classificationand codification. Accounts are to be classified according to different items of expensesunder suitable headings. Each of the headings is to be given a separate code number. Thecodesandsymbolsusedin theprocessfacilitateintroductionofcomputerization.

Determiningthe types of standards and their basis

Standardscanbeclassifiedintotwobroadcategoriesonthebasisofthelengthofuse.

(a) **Current standards**: These are standards which are related to current conditions,particularly of the budget period. They are for short-term use and are more suitableforcontrol purpose. Theyare also more amenablefor combining withbudgeting.

(b) **Basicstandards**: Theseare long-termstandards, someofthemintendedtobeinuseforevendecades.Theyarehelpfulforplanninglong-termoperationsandgrowth.Basicstandardsareestablishedforsomebaseyearandarenotchangedforalongperiodoftime.

It is preferable to use both kinds of standards depending on the nature and type of activityor cost for which they are fixed. Generally, the number of basic standardsmaybeveryfewand current standards are predominant in number.

Basicforstandards

There can be significant difference in the standards set depending on the base used forthem. The following are the different bases for setting standard, whether they are currentstandardsfor short-termor basicstandardsforlong-termuse.

(a) **Ideal standards**: These standards reflect the best performance in every aspect. Theyare like 100 marks in a paper for students taking up examinations. What is possibleunderidealcircumstancesinallaspectsisreflectedinthesesstandards.

They are impractical and unattainable in practice. There utility for control purpose is negligible.

(b) **Past performance based standards**: The actual performance attained in the pastmay be taken as basis and the same may be retained as standard. Such standards donot provide any incentive or challenge to the employees. They are too easy to attain.Theirvalue fromcost control point ofview is minimal.

(c) **Normal standard**: It is defined as "the average standard which, it is anticipated canbe attained over a future period of time, preferably long enough to cover one tradecycle".Theyareaveragestandardreflectingtheaverageperformanceoveracomplete trade cycle which may take three to five years. For a specific period, say abudget period, their relevance is negligible.

(d) **Attainable high performance standards**: They are based on what can be achievedwith reasonable hard work and efforts. They are based on the current conditions andcapability of the workers.These standards are considered to be of great practicalvalue because they provide sufficient incentive and challenge to the workers to attainthem. Any variances from such standard are really significant because the standardwhichisattainablewitheffortisnotattained.

Determiningtheexpectedlevelofactivity

Capacity of operation or level of activity expected over a future period is vital in fixingcurrent or short-term standards. When the activity level is decided on the basis of sales orproduction,whicheveristhelimitingfactor;allstandardcanbedevelopedwiththeactivity level as the focal point. The purchase of material, usage of material, labour hourstobeworked,etc.aresolelygoverned bythe plannedlevel ofactivity.

Settingstandards

Setting standards may also be called developing standards or establishment of standardcostbecauseasaconsequenceofsettingstandardsforvariousaspects,standardcostcanbecomputed.

Setting standards is like laying a building foundation. The success of standard costingsystemdepends on the care withwhich the standards are developed.

It is preferable, particularly in large firms, to establish 'Standard committee' which isresponsiblefordeterminingstandardsinallaspectsof thebusinessandalsomakingsuitablerevisionsinduecourse.Thestandardscommitteeusuallyconsistsof allthefunctional managers like purchase, production and sales, technical experts like ProductionEngineer, the General Manager and the Cost Accountant. It is the Cost Accountant's rolewhichiscrucialbecausehehastoassignthemonetaryvaluesforthedifferentstandardssetbytheotherexpertsineachareaorfunction.

Thefollowing isa briefdiscussion onthe settingofstandardsforeach elementof cost:

(1)StandardsforDirectMaterialCost

Directmaterialstandardsarebroadlydividedintostandardsforusageorquantitystandards and standards for material price. There may be several materials used in theproductionofaproduct.Itisnecessarytosetstandards foreachofthe importantmaterials.

Materialusage or Quantity standards

Thesestandardsdealwiththequantityofmaterialneededforeachunitoffinishedproduct,thequality specifications and tolerances like length, breadth, strength, volume, etc. Based on the pastexperience,thenormallosstobeexpectedhastobedetermined.Basedontheexpectedorpermittedloss, thequantitystandardperunitisfixed.Ittwoormorematerialsaremixedintheproduction,thestandardprop ortionofeachmaterialhastobefixed.

The production manager and technical expert play the most important role in settingquantitystandards.Theirknowledge,experienceandtheshopfloorsituationareinstrumen tal in deciding upon the quality and quantity of each material. The following aretheusual quantity standards set.

(a) Quantityofmaterialperunitoffinishedproduct.
(b) Standardlosspermittedintheproductionprocess.
(c) Theproportionof differentmaterials, ifmorethan onematerial isused.
(d) Theyieldexpectedfrommaterial.

Material price standards: Price standards for the material are the most difficult to setbecause material prices are subject to the market forces. Usually, current market price foreach material, the trends observed and the forecasts of the purchasing department are thedeterminingfactors.

Whilefixingpricestandards,theothertermsliketradediscounts,freight,creditterms,etc.,arealso considered.

Materialpriceshouldalsoincludethecostofpurchasingandstoringincludingthehandlingcosts.

It is customary to prepare a standard 'Bill of Materials' which is a list of all the directmaterialstobeusedandincorporatethereinallthestandardssetforeachmaterialsotthatitact slikeareadyreckoner.

(2) Standardsfor direct labour cost

Thetwomajoraspectsforwhichstandardsaredevelopedrelatingtolabourare(A)Labourtime and (B) Labour rate.

(A) Labour Time Standards: These standards represent the time to be taken by the directlabour in the production of one unit of product or performing a specific operation. It maybe determined with the help of (1) Time and Motion study; (2) Technical estimates; (3)Trialruns;(4)Pastexperience;(5)Caliberoftheworkers;(6)Workingconditions.

Since, human factor is involved, the cooperation of workers should be obtained by suitablebriefingabout the purpose and significance ofthe exercise.

If different kinds of labour have to perform group tasks, standards should also be fixed forlabourmix or gang.

The most ticklish problem in setting the labour time standards is the provision for idletime. Idle timeincludes rest pauses, personal needs of the workers, etc. the care withwhich the idle time standards are fixed determines the level of arguments and quarrels onthe production lines.

Thefollowingaretheusuallabourtimestandards etc.

(a) Standardtime tobetakenforoneunitofoutput.

(b) Idletimepermitted

(c) Proportion of different kinds of labour where two or more kinds of workers areinvolved.

(B) Labour rate standards: Labour rates are generally governed by agreements withtrade unions, the firm's wage policy and incentive systems in use. However, the followingfactors influence the labour rate standards: (i) Existing, labour rates; (ii) Rates paid bysimilar firms; (iii) Type or kind of labour needed for production and (iv) Labour lawsgoverningtheindustry.
Wageratestandardsdifferfordifferentgradesorkindsoflabour.Therateisalsosubjecttorevision whenevernewagreements areconcludedwiththeunions.

(3) Standardsfor overhead cost

Overheads are usually segregated into fixed and variable. It is necessary to fix standardoverhead rates separately for fixed overheads and variable overheads. Separate rates haveto be determined for factory, office, selling and distribution overheads- both fixed andvariable.

Whiledeterminingtheoverheadrates,thefactorstobeconsideredare:

(a) Standard level of activity; (b) Number of units to be produced (c) Labour and machinehourstobeworked.

Standard overhead costs – both fixed and variable should be determined. Based upon thestandard output and standard hours,theoverheadratesarefinalized.

Standardoutput and its standard cost

Once all the cost standards are finalised, it is possible to consolidate them in the shape of'standard cost for standard output'.

The direct material cost per unit, direct wages per unit, fixed and variable overheads perunitcanbelistedout.Thetotalofalloftheserepresentsstandardcostperunit.Thiscanbe multiplied with the standard output for the budget period or a specified period toascertainthestandardcostofthestandardoutput.

Standardhour

If a single product is produced in a firm, the output can be expressed in terms of the unitsof that product. However, several different products may be produced and they may bemeasured in different units like kgs, Tons, liters, gallons, barrels, etc. Though all of thesecan not be expressed in terms of a single measure, it possible to express all of theme interms of 'Time'. Time taken to produce is the common factor for all output. Production,expressedintermsofhoursneededto producethemiscalled'Standardhours'.

According to I.C.M.A., England, "Standard hours are a hypothetical hour which representstheamountofworkwhichshouldbeperformedinonehourunderstandardconditions".

The 'Standard hour' is very useful is ascertaining overhead variances. The total output of afirm comprising different products is expressed in the form of standard hours and the fixedandvariableoverheadratesare set for standard hours.

Revisionofstandards

Currentorshort-termstandardshavetobeperiodicallyrevised.Long-termorbasicstandards may be used for longer periods. They may also need revision when the factorsaffectingthestandardchange.

Revisionmaybeneededinallthefollowingcases:

(a) Change in market price of materials (b) permanent change in labour rates (c) Majoralterations in products or method of production or materials used (d) Basic change inproductspecificationsordesign.(e)Errorsinsettingoftheoriginalstandards.

ESTIMATEDCOSTINGANDSTANDARDCOSTING

Bothstandardscostingandestimatedcostingarepredeterminedcosts.Buttheobjectofstandardcostingdiffers.Thedifferencesbetweenthesetwocostsare:

EstimatedCost	StandardCost
1. Itisusedasstatisticaldata,andleadstoalotofguesswork.	It is scientifically used, and it is a regularsystem of account based upon estimation andtimestudies.
2. Itsobjectsaretoascertain“Whatthecost will be”.	Itsobjectistoascertain“whatthecostsshould be”
3. It gives importance to costascertainmentforfixingsaleprice.	Itisusedforeffectivecostcontrolandtotakeproperactionto maximise efficiency.
4. Itisusedforaspecificuse;i.e.,fixing sale price.	Itisacontinuousprocessofcosting,andtakesinto accountallthemanufacturingprocesses.
5. It can be used where costing is inoperation.	It can be used where standard costing is inoperation.
6. Itisnotaccurate.Itisanapproximation basedonpastexperience.	Asitisbasedonscientificanalysis,itismoreaccuratethantheestimatedcost.

HISTORICALCOSTANDSTANDARDCOST

HistoricalCost	StandardCost
1. Itisanafter-production-recordedcost.	Itisapredeterminedcost.
2. Itis,actually,incurredcost.	Itisanidealcost.
3. Asitrelatestothepast,itisnotuseful for cost control.	Itisafuturecost.Itcanbeusedforcostcontrol.
4. Itisusedtoascertaintheprofitorthelossincurredduringaperiod.	It is used for the measurement ofoperationalefficiencyoftheenterprises.

BUDGETARYCONTROLANDSTANDARDCOSTING

BudgetaryCost	StandardCost
1. It is extensive in its application, asitdealswiththeoperationofdepartmentorbusinessasawhole.	Itisintensive,asitisappliedtomanufacturing of a product or providing aservice.
2. Budgetsarepreparedforsales,production,cashetc.	Itisdeterminedbyclassifyingrecordingandallocatingexpensestocostunit.
3. Itisapartoffinancialaccount,aprojection of all financial accounts.	Itisapartofcostaccount,aprojectionofallcost accounts.
4.Control is exercised by taking intoaccount budgets and actuals. Variancesarenotrevealedthroughaccounts.	Variancesarerevealedthroughdifferenceaccounts.
5. Budgetingcanbeappliedinparts.	Itcannotbeappliedinparts.
6.It is more expensive and broad innature, as it relates to production,sales,finance etc.	Itisnotexpensivebecauseitrelatestoonlyelements of cost.
7. Budgets can be operated withstandards.	Thissystemcannotbeoperatedwithoutbudgets.

1 Elimination of wastage and inefficiency: Wastage and inefficiency in all aspects of themanufacturing process are curtailed, reduced and eliminated over a period of time ifstandardcostingisincontinuousoperation.

2 Norms: Standard costing provides the norms and yard sticks with which the actualperformancecan be measured and assessed.

Limitationsofstandardcosting

1. Itiscostly,asthesettingofstandardsneedshightechnicalskill.
2. Keeping ofup-to-date standardis aproblem.Periodicrevisionofstandardisacostlything.
3. Inefficientstaffisincapableofoperatingthissystem.

VARIANCEANALYSIS

The most significant contribution of standard costing to the science and art of management is the presentation of 'Variances'. As a matter of fact, without determination and analysis of variances, standard costing is meaningless.

The term **variance** is derived from the very 'to vary' which means to differ. According to ***CIMA,*** England, a cost variance is 'the difference between a standard cost and the comparable actual cost incurred during a period". Thus, Variance represent the extent to which actual costs deviate from the 'Norms' or 'Yardsticks'.

FAVOURABLE AND UNFAVOURABLEVARIANCES

Variance may be ***Favourable [positive or credit] or Unfavourable [negative or adverse or debit]*** depending upon whether the actual resulting cost is less or more than the standard cost.

Favourable Variance [F]:

When the actual cost incurred is less than the standard cost, the deviation is known as favourable variance. The effect of the favourable variance increases the profit. Again, favourable variance would result when the actual cost is lower than the standard cost. It is also known as positive or credit variance and viewed as savings.

Unfavourable Variance [A]:

When the actual cost incurred is more than the standard cost, there is a variance, known as Unfavourable or adverse variance. Adverse variance refers to deviation to the loss of the business. It is also known as negative or debit variance and viewed as additional costs or losses.

When the sales/ profit is greater than the standard sales/profits, it is called as favourable variance. When the sales/profit is less than the standard sales/profit, it is known as Unfavourable variance.

The favourable variance is a sign of efficiency of the organization and the Unfavourable variance is considered as a sign of inefficiency.

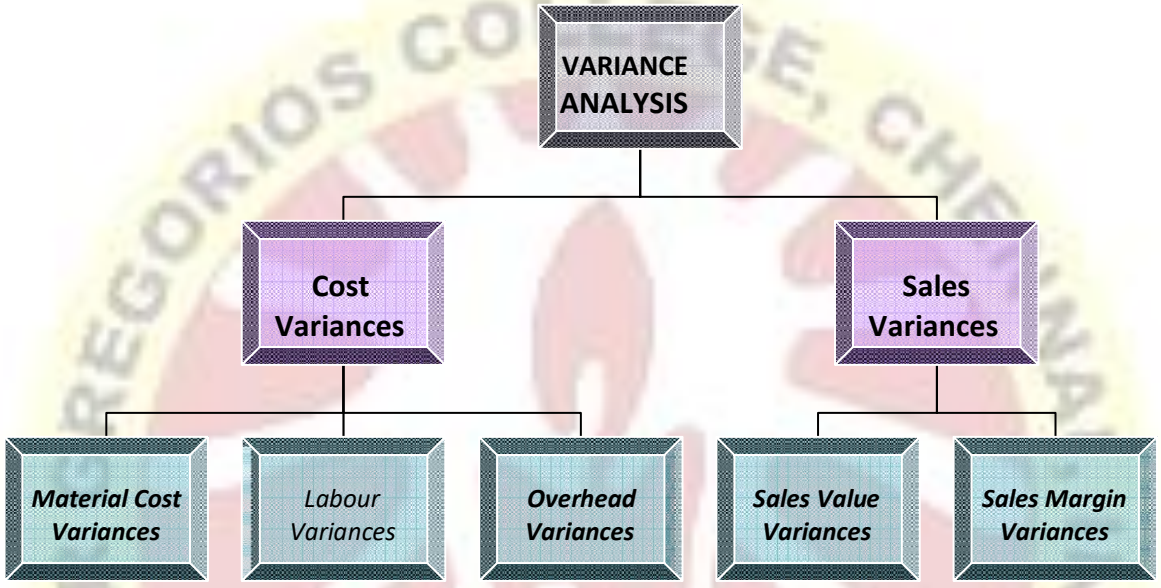
The computation and analysis of variance are the objectives of standard costing. The causes of variance are necessary to find remedial measures; and therefore a detailed study of variance analysis is essential. Variance can be broadly divided into two categories – [1] cost variances and [2] sales variances. Variances can be found out with respect to all the elements of costs i.e., direct materials, direct labour and overheads. In other words, the total cost variances is split into its component parts on the basis of elements, and each element is further subdivided to locate the responsibility of variance. The following are the common variances, which are calculated by the management. Sub-divisions of variances really have given detailed information to the management in order to control the cost.

a. Material costvariances;

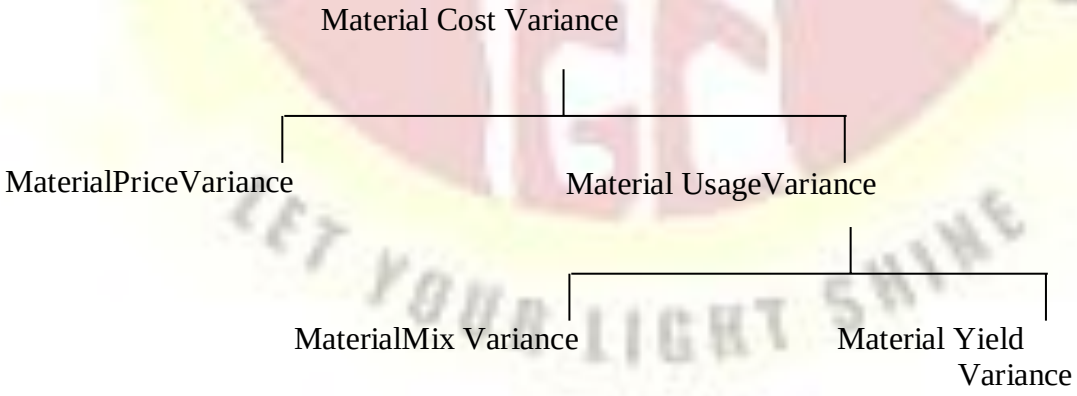
b. Labour or Wagevariances;

c. Overhead cost variances – [i] variable and [ii]fixed

d. Sales variances – volume ormargin



Materials form a very high percentage of total cost. Therefore, it is important to study its variances.



[a] **Direct Material Cost Variance [MCV]** is the difference between the standard costs of direct materials specified for the output achieved and the actual cost of direct materials used. The standard cost of materials is computed by multiplying the standard price with the standard quantity for actual output; and the actual cost is computed by multiplying the actual price with the actual quantity. The formula is:

MC V = [Standard Cost of Materials – Actual cost of materials used]

[OR]

= [Standard cost of Actual output – Actualcost]

[OR]

= ***[SQ x SP] – [AQ xAP]***

Where, SQ refers Standard quantity for actual output; SP means Standard price AQ means Actual quantity and AP refers Actual price

If the actual cost is less than the standard cost, the variance is favourable and vice versa. MCV arises due to change in the price of the materials or a change in the usage of materials

In order to find the exact causes for the material cost variance, the material cost variances is dividend into two. Material price and Materials usage variances are the components of MCVs. Materials usage variance is further divided into material mix variances and materials yield or material sub-usage variances. Let us discuss all these in the following sections.

[b] Materials Price Variance[MPV]

It is that part of material cost variance which is due to the difference between the standard price specified and the actual price paid.

MPV = AQ[SP-AP]

MPV arises due to the following reasons:

i. changes in the market prices of materials; ii. Uneconomical size of purchase orders; iii. Uneconomical transport costs; iv. Failure to obtain cash discount; and v. failure to purchase materials at proper time.

The responsibility of Material price variance is mainly of the purchase manager. However, a general increase in the prices is uncontrollable and cannot fixresponsibility.

[c] Material Usage Variance [MUV]

It is the difference between the standard quantity specified and the actual quantity used.

MUV = SP [SQ-AQ]

MUV may arise due to carelessness in use of materials; loss due to pilferage; faculty workmanship; use of material mix other than the standard mix and defect in plant and machinery causing excessive consumption of materials.

[d] Material Mix Usage[MMV]

It is the part of material usage variance which arises due to change in standard and actual compositions of mix.

MMV = SP [RSQ – SQ]

where RSQ refers Revised Standard Quantity

RSQ= $\frac{\text{StandardQuantity}}{\text{StandardQuantity}}$ X Total Actual Quantity Total

The variance arises in industries like chemical, rubber etc. where definite proportions of different raw

materials are mixed to get a product. Variations may arise due to general shortage or non-purchases of materials at the proper time.

[e] Materials Yield Variance[MYV]

It is part of material usage variance and it is the difference between standard yield specified and actual yield obtained.

MYV = [Standard Yield – Actual Yield] x Average Standard Price per unit

Or

*= [**Standard loss on actual output – Actual Loss] x Average Standard Price per unit***

[f] Materials Sub-usage Variance[MSUV]

It is the general practice to analyze the material usage variance into mix and yield variations. However, in some cases it may not possible or convenient to calculate yield variance. For example information may not be available about units of output, in such cases; sub-usage variance is calculated on the assumption that a single job or work is the output. By computing yield variance become a problem.

MSUV = SP [SQ-RSQ]

Generally material sub-usage variance is not popular among those who use standard costing as a control system.

Note: The symbols "F" refers favourable variances and "A" indicates Adverse Variance.

Relationship		
MCV	**=**	**MPV + MUV**
MUV	**=**	**MMV + MYV/MSUV**

Illustration

Calculate material variances from the following data

	Standard	Actual
Quantity	400 kgs	460 Kgs.
Price	Rs.2 per Kg.	Rs.1.5 Per kg.
Value	Rs.800	Rs.690

Solution

[a] MaterialCostVariance	=	***[SQ x SP] – [AQ xAP]***
	=	[400 X Rs.2] – [460 xRs.1.5]
	=	Rs.800 – Rs.690 **=Rs.110[F]**
[b] MaterialPriceVariance	=	***AQ[SP-AP]***
	=	460 [2-1.5] = **Rs.230[F]**
[c] MaterialusageVariance	=	***SP[SQ-AQ]***
		Rs.2 [400-460] =**Rs.120 [A]**

Relationship and Verification:

MCV = MPV + MUV

Rs.110 [F] = Rs.230 [F] + Rs.120 [A]

Note: 'A' denotes adverse/ negative (-)variance and 'F' denotes favourable/ positive [+] variance.

Illustration

The standard estimate for materials to manufacture 1,000 units of a commodity is 400 kgs., at Rs.2.50 per kg.

When 2,000 units of the commodity are manufactured, it is found that 820 kgs. Of materials are consumed at Rs.2.60 per kg.

Calculate the material variances.

Solution

Working Notes: ***Calculation of standard quantity for actual output***

To produce 1,000 units, standard materials = 400 kgs.

To produce 2,000 units, standard materials = 2,000 /1,000 X 400= **800 Kgs**

[a] Material Cost Variance = ***[SQ x SP] – [AQ x AP]***
= [800 X Rs.2.5] – [820 x Rs.2.60]
= Rs.2,000 – Rs.2,132 **=Rs.132 [A]**
[b] Material Price Variance = ***AQ [SP-AP]***
= 820 [2.50-2.60] = **Rs.82[A]**
[c] Material usage Variance = ***SP [SQ-AQ]***
Rs.2.50 [800-820] =**Rs.50 [A]**

Relationship and Verification:

MCV = MPV + MUV

Rs.132 [A] = Rs.82 [A] + Rs.50 [A]

Illustration

From the following particulars, calculate material cost variance, material price variance and material usage variance.
Material purchased – 3,000 kgs at Rs.6 per kgs;
Standard quantity of material fixed for one unit of finished product – 25 kgs at Rs.4 per kg.
Opening stock – Nil and Closing Stock – 500 kgs. Actual
output during the period – 80 units

Solution

Working Notes: [1] Actual quantity used = Opening Stock + Purchases – Closing Stock
= Nil + 3,000– 500 = **2,500kgs**

[2] ***Calculation of standard quantity for actual output***

To produce one unit, standard materials = 25 kgs.
To produce 80 units, standard materials = 25/1 X 80 = **2,000 Kgs**

[a] Material Cost Variance = ***[SQ x SP] – [AQ x AP]***
= [2000 X Rs.4] – [2,500 x Rs.6]
= Rs.8,000 – Rs.15,000 **=Rs.7,000 [A]**
[b] Material Price Variance = ***AQ [SP-AP]***
= 2,500 [6-4] = **Rs.5,000[A]**
[c] Material usage Variance = ***SP [SQ-AQ]***

Rs.4 [2,000-2,500] =**Rs.2,000 [A]**

Relationship and Verification:

MCV = MPV + MUV
Rs.7,000 [A] = Rs.5,000[A] + Rs.2,000 [A]

DIRECT LABOUR COSTVARIANCE

Labour cost variances arises because of [1] difference in actual rates and standards rates of labour and [2] variation in actual time taken by workers and the standard time allotted to them for performing a work. The labour variances are computed on the same pattern as those of material variances as calculated in the above section. One can find out the various formulae for Direct labour variances by simply putting the word 'time' in pace of quantity. The various labour variances which will be analysed are asfollows:

a. Labour Cost Variance;
b. Labour Rate Variance;
c. Labour Time or EfficiencyVariance;
d. Labour Idle Timevariances;
e. Labour Mix or Gang Composition Variance;and
f. Labour YieldVariance

[a] Labour Cost Variance [LCV[

Labour cost variance is the difference between the standard wages specified and the actual wages paid.

LCV = Standard cost of Labour – Actual cost of labour
= [ST x SR] – [AT xAR]

If the standard cost is higher, the variation is favourable and vice versa.

[b] Labour Rate Variance [LRV]

It is the difference between the standard rate of wages specified and the actual rate paid to the labour.

LRV = AT [SR-AR]

Labour rate variance arises due to changes in the basis wage rates; rate of difference methods of wages payment and unscheduled overtime.

[c] Labour Efficiency Variance[LEV]

It is a part of labour cost variance. It is the difference between standard labour hours/time specified and actual labour hours spent.

LEV = SR [ST-AT]

This variance arises due to lack of proper supervision; insufficient training; poor working conditions and increase in labour grades utilized.

[a] Labour Idle Time Variance[LITV]

Idle time variance is due to time lost abnormally on account of strikes, lockouts, power failure, machine breakdown etc. Time wasted due to such causes on which the individual workers have not control should be separately accounted for should be shown as separate variance.

LITV = SR X Idle Time[IT]

It should be noted that this variance is always shows [A] adverse variance

[b] Labour Mix Variance[LMV]

The difference between the standard labour grade specified and the actual labour grade utilized is refereed as labour gang composition variance.

LMV = SR [RST – AT] where RST refers Revised Standard Time RSQ=

$$\frac{\text{StandardTime}}{\text{Total Standard Time}} \text{ X Total ActualTime}$$

[c] Labour Yield Variance[LYV]

It is just like material yield variance and it is the difference between the standard labour output and the actual labour output or yield. It is calculated as below:

LYV =Standard Cost per unit [Standard output for Actual mix – Actual output]

Note: The symbols "F" refers favourable variances and "A" indicates Adverse Variance.

Relationship		
LCV	**=**	**LRV + LEV**
LEF	**=**	**LMV + LYV + LITV**

Illustration No. 16.6

The standard time and rate for unit components are given below: Standard hours 20;
Standard Rate Rs.5 per hour;
Actual data and related information are as under:
Actual production 1,000 units:
Actual Hours 20,500 hours; Actual Rate per hour Rs.4.80

Calculate [1] Labour Cost Variance; [2] Labour Efficiency Variance ; and [3] Labour RateVariance