J.K. SHAH®
CLASSES
CAFC→INTER CA→FINAL CA↗

FINAL CA
MAY '19
REVISION NOTES
Costing

Summary Hand Written Notes

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Activity Based Costing:

⇒ Traditional Approach. [Absorption Costing]

- Overheads is an Indirect Cost.

⇒ Types of department.

Production dept — Service dept.

Production dept → Direct, Indirect

Service dept → Only Indirect

→ Indirect + Only Indirect = O'heads.

- Distribution of o'heads.
  1. Allocation of o'head
  2. Apportionment of o'head.
     a. most suitable basis.
     b. Next best basis.
     c. Last Resort → mach. Related → mhrs
        → Lab. Related → Lab hrs.
  3. Redistribution of o'head of service department.

Independent | Partially dependent | Fully dependent

- Computation of Absorption Rate = Budgeted o'head / Budgeted level of Act.

Output | mhrs. | Lab hrs | Lab cost | mat cost | Prime cost.

⇒ Modern Approach [Activity Based Costing]

- We will identify various Activities going on in the organisation.
- We will total all cost of each Activity.
- We will identify cost drivers for each Activity
  "Cost drivers are factor Responsible for change in Activity Cost"
- We will apportion Activity cost to Cost objects with the help of cost drivers
  "cost object is the one who will bear the cost i.e. Product, dept, division etc".

⇒ Apportionment of o'head Cost to Activities.

			Activities.			
O'heads	Amt	Basis	ABC	DEF	FGH	IJK
———	xxx	[: :]	✓	✓	✓	✓
———	xxx	[: :]	✓	✓	✓	✓
———	xxx	[: :]	✓	✓	✓	✓
			xx	xx	xx	xx

⇒ Apportionment of Activity Cost to compute Fact. o'head

			Cost objects			
Activities	Amt	Cost drivers	P	Q	R	S
ABC	xxx	——— [: :]	✓	✓	✓	✓
DEF	xxx	——— [: :]	✓	✓	✓	✓
GHI	xxx	——— [: :]	✓	✓	✓	✓
JKL	xxx	——— [: :]	✓	✓	✓	✓

Note : only if question asks or out of many activities only some activities data are give we will compute cost per unit of cost drivers.

⇒ Assignment.

⇒ Basic Condition

- Balance matrix ⇒ Row = column.
  If not than introduce dummy Row or column to the extent required to Balance the matrix.

- Minimisation.
  If not than convert into minimisation ~~from~~ maximisation by selecting highest Element of matrix and subtract All Element from Highest Element.

⇒ Steps.

- Row minima
- Column minima [on matrix after Row minima]
- Draw lines to cover zero.
  [Be careful you have to draw minimum lines to cover all zeros.
  ∴ Start from Row/column with maximum zero.]
  After drawing lines pls Recheck possibility of completing in less than no. of lines actually drawn to avoid mistake.
- only if no of lines = order of matrix
  [ie no of Rows/column]

Solution is optimum & we can proceed to find assignment.

⇒ If no. of lines ≠ order of matrix solution is not optimum.

Identify minimum uncut no.

① Subtract from all uncovered no.'s

② Add at point of intersection.

and draw lines again to check for optimality.

⇒ If solution is optimum move to final assignment.

- only ONE TASK ONE RESOURCE
- ∴ Start with Row/column with one or least Zero.
- After assignment cancel all zeroes in that Row & column.

⇒ If for an assignment you have more than one option. i.e. No Row or Column has single zero. Than solution has Alternate solution.

⇒ If during Final assignment you do not have Even Single Row or column with zero than solution is wrong. check & start again mostly you have drawn Extra Lines to Cover Zero.

⇒ If at any Route assignment is prohibited we will write "M" on that Route.

Balance Score Card

⇒ Customer Perspective

- % of Repeat customers [Resort]
- Number of Customer complains.
- % of customer using loyalty card. [super market]
- No. of discount vouchers redemed.
- Time for loan / New Product. [Banking sector]
- No of Accounts closed
- Closer Receipt Received
- Discourage bussiness of cheques [Performance Indicator. Credit card.]
- Focus on large spenders
- Issue more Cards
- Service Complain Received Telecom
- Turnover Rate among member [Fitness centre]
- Customer Satisfaction Rate
- Flight cancellation Rate [Airlines]
- Lost of Bag Reports
- Patient Satisfaction Survey [Health Care]
- Patient Referral Rate
- 100% on time delivery [Courier]
- Quality
- Price

⇒ Internal Business.

Resort
- Servia Rating of spa.
- Staff hours / guest
- % Cost spent for maint.
- Travel guide Rank of Rest.

Computer mfg. Co.
- Set up servia centre in all major cities for after sales.

Super Market
- Time spent by customers in queuing to pay for products at a check out
- Time spent by customer care executive to handling Cust queries.
- No of Times home delivery made.

Banking → Products purchased / customer
→

Credit card:
- Increased marketing spend
- Achieve Economies to scale
- offer more Products.

Telecom
- Establishing cust. Relationship Centre.

Fitness Centre:
- Turnover Rate among member
- Customer satisfaction Rate.
- No. of Employee complaints.
- No of Equipment not Avlbl on any day

Health Care - Weekly Patient Complaints

Airlines
- On time performance of Airlines

Extra
- New Product Introdn.
- Sales Registration

⇒ Innovation & learning OR learning & Growth.

Supermkt
- No. of staff training days.
- No. of schems launched.

Banking
- New product tie up
- No. of Cust. Buying New products/ servic

Credit Card Co.
- Outsource IT Jobs
- Improve staff training levels
- Acquire other companies.

Telecom
- Employee Training.

Fitness Centre
- No. of New Eqpmnt put into servic
- No of staff participating in training.

Resort
- Employee Retention
- Number of new services offered.

Health Care
- No. of Grants awarded to healthcare.
- Employee turnover Rate.

Tution Centre.
- Set up class on internet facility

Govt Tax dept.
- Ensure Computer training to all officer.

Misc:
- Research & Development.
- Cost leadership.

⇒ Financial Perspective

General
- Profitability
- Sales.

Resort
- Economic value added
- Revenue per villa.

Banking
- Growth of volume.

Credit card
- Increase in mkt share
- Reduce debt
- Increase % Fee.

Telecom
- Operating Ratio
- Average Revenue

Fitness Centre
- Operating Exp. Relating to Budget.
- Cash Flow
- Total Daily operating Revenue

Banking
- Outstanding loan Balances
- Deposit balance of Banking
- Non Interest Income of Banking

Budgetary Control

⇒ **Flow of Budgets**

Sales Budget [of Finished Goods]

↓

Prodn. Budget [of Finished Goods]

Purchase Budget [of Raw material] | Labour cost Budget [Labour]

Finished Goods → Sales → Sales Budget

Finished Goods → Produced → Prodn Budget

Raw Mat. — Consum. → Consumption Budget

Raw Mat. → Purchased → Purchase Budget

Note: Finished goods is sold ∴ Sales will be starting point.

Raw material is consumed ∴ Consumption will be starting point.

Format of Budgets.

⇒ Sales Budget.

Sales of Year 20xx	xx
Add ↑ or ↓ in Sales	x
Budgeted sales Qty	xx
xx x S.P.P.U	xx
Budgeted Sales in (₹)	

If sales is given in ₹ to convert it into units we will have to prepare cost sheet.

⇒ Production Budget.

	Budgeted sales unit	xx
Add:	Clsng stk	x
Less:	Opening stk	(x)
	Budgeted Prodn unit	xx

⇒ Always in unit.

⇒ If data of clsng & opng stk given in "₹" Convert into unit by dividing with cost of prodn p.u. which can be computed with help of cost sheet.

⇒ Prodn Budget is usually for FG, if asked for Rm than instead of Budgeted Sales we should take Budgeted Consumption.

⇒ Purchase Budget.

	Budgeted Consumption of R.m (Budgeted Prodn x Rm per unit)	xxx
Add:	clsng stk of Rm	xx
Less:	opng stk of Rm	(xx)
	Budgeted Purchased of R.m	xxx
	x Pur. price per Rm.	x
	Budgeted Purch in (₹)	xxxx

Note: If stock is given in ₹ divide by R.m purch. price per unit.

⇒ For Purchase & production Budget if loss is given then that much we will have to produce or purchase more.

↳ what we get by Budget is Net Prodn/ Purch Require Add: loss to arrive at Gross prodn/ purch.

⇒ Labour Cost Budget.

Budgeted Labour hrs. [Budgeted Prodn x Budg. Lab hrp.u.#]	xxx
x Budgeted Rate/hr	xx
Budgeted Labour Cost.	xxxx

will be standard hours. but if workers are inefficient we will consider more than Std hours.

If Efficiency Ratio is Less than 100 ⇒ Inefficient

If Efficiency Ratio is more than 100 ⇒ Efficient.

Efficiency Ratio = $\frac{\text{Std hours}}{\text{Actual hours.}} \times 100$ [As per time]

~~Std~~ $\frac{\text{Actual units}}{\text{Std units}} \times 100$ [As per unit]

⇒ Flexible Budget:

Flexible Budget is a budget which will identify cost into two parts

Fixed cost — [Will Remain Constant irrespective of level of Activity: will change only if Inflation]

Variable cost — [will Remain constant per unit will change with inflation but only on unitwise.]

⇒ General Tips

- Identify ~~question~~ Fixed cost & Variable cost.
- Fixed cost will change only with inflation.
- Variable cost will change with inflation as well as change in units.
- Pls underline if any step level cost is changing. i.e. After certain no. of units lab cost will increase or so.

⇒ Cash Budget.

Opening Cash Balance:

Add: Receipts

Less: Payments

Closing Cash Balance

General tips:

- Identify cash & credit transactions separately.
- Analyse credit period from question or balance sheet.
- make working note for cash to be received and payment to be made.
- If any surplus cash is to be brought by any of member/ shares etc. make dummy cash budget excluding cash to be brought in & decide how much cash will be brought.

⇒ Efficiency Ratio = $\frac{\text{Std hrs for Actual Prodn.}}{\text{Actual hrs worked.}}$

Activity Ratio = $\frac{\text{Std hours (for Actual Prodn)}}{\text{Budgeted hrs.}}$

[ie.] = $\frac{\text{std hrs for Actual Prodn.}}{\text{Std hrs for std prodn.}}$

Capacity Ratio = $\frac{\text{Actual hours worked}}{\text{Budgeted hours.}}$

(i.e) = $\frac{\text{How many hrs we actually worked}}{\text{How many hrs we were suppose to.}}$

C.P.M. P.E.R.T.

⇒ Rules for Network diagram.

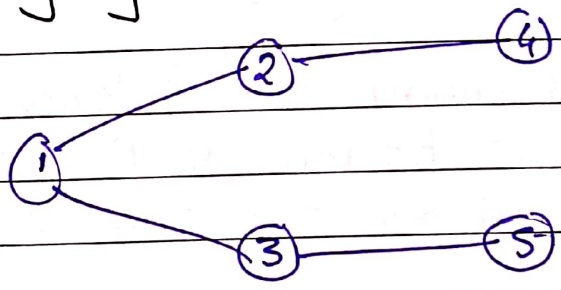
- Start from Left to Right.
- Number on head Event must be greater than tail Event.
- Single Initial i.e start & Single terminal i.e End point.
- Avoid Bending of Activity if possible
- Avoid Criss Cross of Activity if possible

⇒ Duplicate Activities.

Whenever two activities have same head and same tail Event.

Not allowed in Network diagram.

⇒ Dangling Activities.

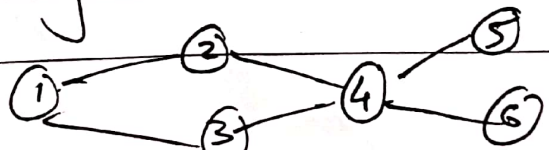


②→④ & ③-⑤ are dangling Activity

not allowed. so join them.

⇒ Introduction of Dummy.

- To show correct precedence
- To Avoid duplicate
- To Bring loose End to common End.



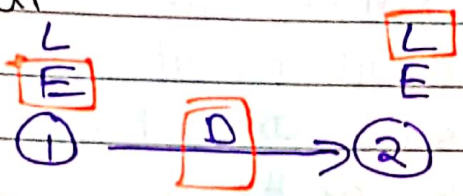
⑤ ⑥ Loose End.

⇒ Slack: Extra time with an Event

"L - E"

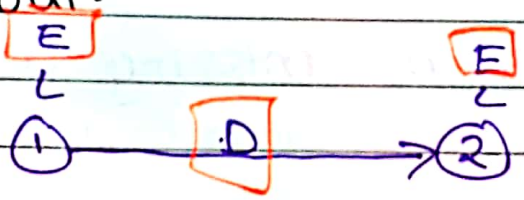
Float: Extra time with an Activity

Total Float.



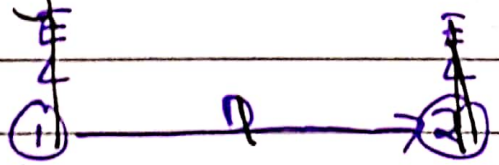
$TF = \underset{H.E}{L} - \underset{T.E}{E} - D$

Free Float.

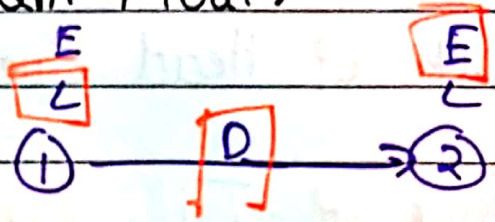


$F.F = \underset{H.E}{E} - \underset{T.E}{E} - D$

Interfering Float. = Total Float - Free float.



Independent Float:



$Ind.Float = \underset{H.E}{E} - \underset{T.E}{L} - D$

EST : Earliest Start time of Activity
E of Tail Event

EFT : Earliest Finish Time.
EST + Duration.

LST : Latest start tim of Activity
LFT - Duration

LFT : Latest Finish time of Activity
L of Head Event.

TF : LST - EST or LFT - EFT

Int. Fl.: Slack of Head Event.

Free Float: T.F - Int. Float.

Indep. Float: Free Float - Tail slack.

⇒ If question is on missing data. Do remember.

- EST = E of Tail Event
- Total Float of critical Activity = 0
- For Critical Activity E = L
- Float = $\underset{H.E}{L} - \underset{T.E}{E} - D$

⇒ Two type of slack

Head slack : slack of Head Event

Tail Slack : slack of Tail Event.

Crashing.

⇒ Draw the diagram.

- On middle of an arrow we will write duration.
- On Head of an arrow : cost of crashing / day

$$\text{cost of crashing / day} = \frac{\text{Crash cost} - \text{Normal cost}}{\text{Normal duration} - \text{Crash duration}}$$

i.e cost slope

- on tail of an Arrow = No of days activity can be crashed by.
  i.e Normal duration - Crash duration.

⇒ Steps for crashing.

- Always crash cheapest critical Activity first
- Crash by that many day so that we reach next maximum. [Please see this step carefully after crashing Activity check what is revise duration for all and not only for critical path].
- If more than one critical path crash common Activity unless crashing individual Activity is cheaper.
- Stop crashing : when even if single critical path does not have any activity which can be crashed further.

If optimum duration: Stop crashing when Cost of crashing Exceeds benefits of crashing.

P.E.R.T.

Three time Estimates

Tp	= Pessimistic time	= T_p	Slowest
To	= Optimistic time	= T_o	Fastest
Tm	= most likely time	= T_m	most likely

Diagram with the help of

TE = Expected time = $\frac{To + 4Tm + Tp}{6}$

longest path = critical Path = Expected Project duration.

Standard deviation of Act = $\frac{Tp - To}{6}$

Variance of Activity = $\left(\frac{Tp - To}{6}\right)^2$

Variance of Project duration = Sum Total of All Critical Act. Variance

Standard deviation of Project duration = $\sqrt{\text{Variance of Project duration.}}$

To compute probability of specific duration we will use "Z" table

$Z = \frac{x - \bar{x}}{\sigma \text{ of C.P}} = \frac{\text{Specific dur.} - \text{Expected duration}}{\sigma \text{ of C.P.}}$

Learning Curve.

⇒ Whenever Production Qty doubles Avg hrs for cumulative no. of units will show a steady down fall.

Units	Avg hrs		Total hr
1	1000	90%	1000
2	900	90%	1800
4	810	90%	
8	729	90%	
16			

⇒ If no. of units does not fall in geometric progression

$y = a x^b$ → b → Learning Index. = $\frac{\log \text{of learning Rate}}{\log 2}$

y ← Avg hrs for x no. of units

a ← Avg hrs for initial unit

x → Total no. of units

For Total hrs = $yx = ax^{b+1}$

⇒ If learning occurs in batches or prodn is in batches then

y = Avg hrs/cost for x no. of batch

a = Avg hrs/cost for initial batch

x = Total no. of batch.

⇒ Be careful for incremental unit in that case we find for total unit before this unit & total including current unit

For Eg Total of 250 − Total of 249 = for 250th

Linear Programming Problem

- Formulation
  - English → Equation.
  - Components:
    - Decision Variable
    - Objective Fn.
    - Constraints.
- Solution.
  - Graphical
    - only when 2 variable
  - Simplex
    - 2 or more variable

Choose D.V in such a manner that it helps you to draft objective function & Constraints.

⇒ Simplex

- Basic Condition.
  - → To Convert inequality into Equality
    - ↳ By introducing slack i.e "+1 S_1" if inequality is "≤"
    - ↳ By introducing Surplus Variable i.e "-1 S
      if inequality is "≥"

Date
Page

→ To have positive identity matrix in ib IBFS. $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

→ If we introduce slak i.e +1S, positive identity matrix is formed on its own.

→ If we introduce surplus i.e -ve slack -1 S, positive identity matrix is to be formed with help of original variable or Artificial variable.

⇒ Only if basic condition is met we will proceed to simplex table with 5 column.

① Basic Variable ⇒ what to produce?
② Profit per unit ⇒ Profit of B.V.
③ Qty ⇒ How much to Produce?
④ Variables
⑤ Replacement Ratio

profit if we introduce that variable

			C_j →					
B.V.	P.P.U	Qty	x	y	S_1	S_2	Replacement Ratio.
							$\left[\frac{\text{Qty}}{\text{K.C.}}\right]$
Z_j			Σ[P.P.U × Variable]				
$C_j - Z_j$ →							

opportunity loss if we introduce variable

Net profit: if we introduce that variable

⇒ First table.

⇒ Introduce those variable which are forming positive identity matrix.

⇒ Profit p.v. of Basic variable will be from objective fn.

⇒ Qty Columnn in first table will be Right hand side constant factor.

⇒ In variable we will write coefficient of each variable from Respective constraint.

⇒ On top of table C_j, below the table Z_j

C_j = Coefficient of each variable from obj. fn.

$$Z_j = \sum [\text{Profit p.v.} \times \text{Coefficient of variable}]$$

⇒ Below Z_j we will compute "$C_j - Z_j$" also known as ~~NRV~~ Net Evaluation Row [NER] or Incremental Contribution.

⇒ Highest $C_j - Z_j$ value will be selected as ~~Key Colu~~ Entering Variable "EV" and Entire Column will be marked as Key Column.

⇒ We will now compute "Replacement Ratio"

Replacement Ratio = $\frac{\text{Qty}}{\text{Key Column}}$.

⇒ least positive value or "0" will be selected as departing variable. and entire Row will be marked as "Key Row"

⇒ Intersecting Element will be marked as Key Element.

⇒ Subsequent table.

In subsequent table in place of Departing variable we will introduce entering variable.

In subsequent table we will have two types of Row ie "Key Row" & all other "Non Key Row"

New Key Row = $\frac{\text{Old Key Row}}{\text{Key Element}}$.

New Non Key Row = Old Non Key Row − Old Key Row × Fixed Ratio

Fixed Ratio = $\frac{\text{Corresponding Key Column Element}}{\text{Key Element}}$

⇒ Minimisation.

All steps are same Except.

⇒ Instead of P.P.U it will be C.P.U.

⇒ In maximisation we select highest "$C_j - Z_j$", In minimisation we will select Lowest i.e "Highest Negative"

⇒ Replacement Ratio Treatment will be same.

⇒ Optimality is Reached when all "$C_j - Z_j$" value are Either "0" or ~~Negative~~ positive

⇒ "Artificial Variable"

⇒ Introduce only when ~~artificial Variable~~ positive Identity matrix is not formed.

⇒ If Artificial Variable exist in final table soln will be termed as infeasible.

⇒ Coefficient of Artificial Variable in obj Fn.

Obj Fn	: Max Z	Min Z
Coeff in obj Fn:	$-M$	$+M$
Reason.	Highest loss making ∴ System will throw	Highest Costing Product ∴ System will throw

Marginal Costing.

Two type of Questions.
1- C.V.P analysis
2. Decision making.

⇒ C-V-P- Analysis

⇒ Income Statement.

Sales	xx
− V. Cost.	(xx)
Contribution	xx
− Fixed cost	(xx)
Profit	xx

⇒ Survival of Business [mostly Break Even]

⇒ BEP sales in unit ⇒ $\frac{\text{Fixed cost}}{\text{Cont p.u.}}$

Cont p.u. is profit of a product

BEP sales in ₹ = $\frac{\text{Fixed cost}}{\text{P.V. Ratio.}}$

P.V. Ratio is Amount we get per ₹100

⇒ P.V. Ratio = $\frac{\text{Cont}}{\text{sales}} \times 100$ or $\frac{\text{Difference in Profit/Cont.}}{\text{Difference in Sales.}}$

⇒ Margin of Safety sales (Extra sales to Earn profit)

$= \frac{\text{Profit}}{\text{Cont p.u.}}$ or $\frac{\text{Profit}}{\text{P.V. Ratio}}$

⇒ Total Sales $= \frac{\text{F.C} + \text{Profit}}{\text{Cont p.u or P.V. Ratio}}$

⇒ If Decision is to shut down (for temporary period), we compute shut down B.E. Point.

Shut down BEP: $\frac{\text{"Difference in Fixed Cost"}}{\text{Difference Cont p.u.}}$

⇒ Pls Look for Fixed cost carefully i.e If we operate and if we dont operate. If we dont operate we may incurr for some Extra fixed cost which is also required to be added up in Fixed cost if we shut down.

⇒ Indifference point.

One option.	Second option.
↓	↓
Higher Fixed Cost	Lower Fixed Cost
Lower Variable Cost p.u.	Higher Variable Cost p.u.

⇒ Indifference or Cost Break Even Point.
Point

$$= \frac{\text{Difference in Fixed cost}}{\text{Difference in Variable cost p.u.}}$$

⇒ Two type of question may come.
→ Directly gndifference point.
→ While solving sum we have two or more alternative to choose from. and above condition Exist.

⇒ Pls also compute Fixed Cost as well as Variable cost p.u. under above alternative if not given.

⇒ If more than two Alternative then compute for ~~one~~ two. at a time and than other two.

⇒ Final Decision.
If level of Activity above Cost B.E.P.
Go for. "Higher Fixed Cost But Lower V.C.P.U"

If level of Activity below cost BEP.
Go for. "Lower Fixed Cost But Higher V.C.P.U"

⇒ **Limiting Factor.**

If in any question ~~to~~ Limitation in any Resource is given i.e. maximum Labour or maximum Raw material etc. than pls check for Limiting Factor i.e. compute Total ~~Avail~~ Requirement.

Total Requirement > Total Availability

Concept of Limiting Factor Applies.

⇒ In the Event of Limiting Factor compute Contribution per Limiting Factor for Ranking.

⇒ Based on Ranking limited Resources should be allocated.

"Note" with the Help of Limiting Factor you will only get maximum Contribution. If Product wise Fixed Cost is given then Ranking will FAIL. In that Case get maximum Contribution first and than decide comparing product wise Fixed Cost.

⇒ General Tips for C.V.P. Analysis

⇒ Read question twice
⇒ Underline Reqd. part.
⇒ Assess which concept is Applicable & How can we use it.
⇒ If questions are asked in parts answer also in parts.
⇒ If Semivariable cost is given.
  ↳ First treat S.V.Cost as V.Cost to get sum units.
  ↳ Then treat S.V.Cost as fixed cost.

⇒ Look for Change in Fixed Cost sum.
  ↳ In such sums usually there may be multiple Break Even.
  ↳ Assess Both option at Every Level where fixed cost is changing.

Relevant Costing.

⇒ Anything which will happen If and only If we accept the proposal.
If we accept it will happen.
If we do not Accept it wont.
Is RELEVANT.

⇒ 1. Anything which have already Happened
2. Anything which is going to happen whether we accept the proposal or we reject the proposal it will SHII happen
Is ALWAYS IRRELEVANT.

⇒ Evaluation of Proposal.

I Relevant Revenue.
→ Money to be Received ××
→ Outflow to be Avoided ××
I ××

II. Relevant Cost.
→ Money to be spent. ××
→ Inflow to be Lost ××
II ××
Relevant Gain/(Loss) I-II ××

⇒ material.

Not in stock
[Current mkt price]
Relevant

In stock.

Regularly use material
[as good as not in stock]
Current mkt price Relevant.

Special stock.

useless stock
↓
Disposable cost

Yes
↓
Relevant Revenue

No
↓
Irrelevant

useful stock

Use the stock
[If we use we loose]
↓
Howmuch to loose we will have to choose.

Buy the stock
[If we Buy we pay]

Labour

Piece Rate System

[Incremental labour cost]

Piece Rate system with Guaranteed wages

[Incremental Lab cost. Compare Lab cost before and after proposal]

Time Rate system

Idle time

Yes

Terminating

Yes → Lab cost Relevant.

No → Differential Pay

Yes → Incremental Lab Cost Relevant

No → Irrelevant

No

Hire, o'time, outsource → Incremental Lab Cost Relevant.

Transfer from other Job.

Contribution lost excluding Lab cost Relevant.

*① ⇒ Always check whether contribution is given or Not If not compute.

⇒ while computing ~~Lab~~ Contribution Excluding Lab Cost.

⇒ Direct Contribution is given check whether it is inclusive of Lab cost or exclusive, If Inclusive then add back Labour cost.

⇒ Variable o'head will always be Relevant many a time VOH may be Linked to labour hour or labour cost. It may be the case Labour ~~is~~ Cost is irrelevant but VOH will be Relevant.

Pls be careful in VOH as it is one of the most prominent Mistake.

⇒ Fixed o'head will mostly be Irrelevant. Only "Specific Fixed Cost" will be Relevant.

- Fixed o'head added / charged / Absorbed will always be Irrelevant.

Look for word [incurred] ⇒ Relevant.

Pricing Policy

Company ⇒ Customer

- Established product
  - Normal Condition → Total cost plus.
    [as we are already established we can demand premium]
  - #1 Special Condition. → Marginal cost plus.
    [#1 Flood, Earthquake etc. tough competition., Recession etc]
- New product.
  - New for mkt → Yes
    - #2 Skimming → Total cost plus Huge Profit
    - Normal → Total cost plus Nominal profit
    - #3 Penetration. → Marginal cost plus Nominal Profit
  - New for co. → Positive Factor
    - No. → Marginal cost plus.

#2 ⇒ Technological Advanced-product
⇒ Niche crowd target. etc.

#3 ⇒ Intention to capture market.
⇒ Break the competition. etc.

⇒ Two Types of question.

① Theory:
Use the chart & General Knowledge.

② Practical: Compute Price.

- Question may ask to compute selling Price = Total cost plus profit
In some situation it may be variable cost plus profit.

- If question Ask to ~~com~~ decide between two different pricing between two products.
Note:- Product differentiation should be spelt out in Price differentiation.
- ~~If price is not~~

- If profit % ge is given or Trade discount is given then. Take selling price as 'x' and proceed.

- If Product is new we usually assume New for Co. & no positive factor. ∴ marginal Cost plus.

- **Special Question.**

⇒ Compute S.P. of two product if cont/labhr must be same.

- Read Question and analyse data.
- Profit if given then profit plus fixed cost = Contribution.
- If Fixed & variable not bifurcated bifurcate first and add to profit.
- If profit is not given but it is given as % of cost or Capital Employed. Identify Cost or Capital Employed first.
- Once Contribution is arrived distribute in the Ratio of labour hours to products.
- contribution plus Variable Cost = Sales price.

⇒ If loss is given while production we may have to produce more than Required. & Total Cost will be charged to product.

Special Cases of Simplex.

1. **Alternate solution.**

Whenever Non Basic Variable has its $C_j - Z_j$ value as "0"

2. **Degeneracy**

Whenever Qty column has "0" value Solution is said to be degenerated.
that will always happen if there is tie in Replacement Ratio

3. **Infeasible Solution**

Whenever in final optimum table there exist "Artificial variable" ie "A" Solution is said to be infeasible.

4. **Unbound Solution**

Whenever for an Entering variable, there is no variable ready to depart i.e Replacement Ratio is Either "-ve" or "∞" then Solution is said to be unbounded.

5. Shadow price

Cost of utilising your Resource for any Purpose other than optimum utilisation.
i.e "Z_j" value of slack variables.

Questions:

=> what will be loss if we shut machine for 2 or more hrs.

=> How much will you be willing to Pay for an extra hr of Resource.

=> How much will you charge for on hr of Resource

6. Extra Questions

=> How much will you wont to increase price if customer wants to Buy the non Basic Variable.
Answer => "$C_j - Z_j$" value of that variable.

=> what will be effect if we introduce a variable may be original or slack.
Answer => multiply no. of Resource to be introduced into Coeff of that variable from Constraints.

Standard Costing.

⇒ material cost, Labour Cost & VOH cost are all variable cost and therefore we will have to ensure both Std data as well as actual data are for same output.

⇒

Material Cost variance

(Std total mat cost - Actual total mat cost)

How much total mat cost we should have incurred & How much we actually incurred

Mat pria Variance

[Std pria - Actual pria] x Actual Qty

[At what pria we should have & At what pria we actually have]

Material usage Var.

[Std units - Actual units] x Std pria

[How many units we should have & How many units we actually have]

material mix variance

[Std mix for Actual input - Actual mix for Actual input] x Std pria

[Keep the base constant i.e Actual Input & then Std mix & Actual mix]

material Yield Variance

[Std total units - Actual total units] x Std Avg Cost

[Compare total units x Avg Cost]

⇒ **Labour Cost Variance**

(Std total Lab cost − Actual total Lab Cost)

How much total lab cost we should have & How much we actually have

| |

Labour Rate Variance

(Std Rate − Actual Rate) × Actual hr

[At what Rate we should have & At what Rate we Actually have]

Labour Efficiency Var.

[Std hr − Actual hr] × Std Rate

[How many hr we should & How many Hr we actual

Labour Idle time Var.

Idle hrs × Std Rate.

Lab mix Var

[Std mix in Actual hr worked − Actual mix in Actual hr worked] × Std Rate

[Std total hrs − Actual total hrs worked] Std Avg Rate

Lab Sub Eff. Var

⇒ Note : Output can be expressed in two ways

↳ ① Either in terms of Actual output. OR

② In terms of std hrs for Actual output.

Eg: 1 unit takes 5 hrs to produce workers produce 600 units:

↳ ① Either 600 units were produced.

↳ ② 3000 [600 × 5 std hrs] std hrs were produced.

Fixed o'head Cost Variance

[Absorbed o'head - Actual o'head]

[Actual units x A.R/unit]
or
[Std hrs for Actual output x A.R/hr]

[How much have we absorbed & How much have we actually incurred]

Compute following Ab. Rate.

1 unit = ₹ .... [Std o'head ÷ Std unit]

1 unit = ... hr [Std hrs ÷ Std unit]

1 day = ₹ .... [Std o'head ÷ Std day]

1 day = ... hr [Std hrs ÷ Std days]

1 hr = ₹ [Std o'head ÷ Std hrs]

Fixed o'head Expenditure Variance

[Std o'head - Actual o'head]

[How much we should have incurred & How much we actually incurred]

Fixed o'head Volume Variance.

[Std units - Actual units] x A.R/unit.

[How many units we should have produced & How many units we actually produced]

Fixed o'head Capacity Variance

[Std hrs - Actual hrs] x A.R/hr

[How many hrs workers should have come & How many hrs workers actually came]

FOH Calendar Variance

[Std days - Actual days] x A.R/day

How many days workers should have
&
How many days workers actually have.

FOH Net Capacity Variance.

Std hrs in Actual days.	xxx
(-) Actual hrs	(xx)
	xx
x A.R/hr	x
	xx

How many hours workers Should have in Actual days
&
How many hrs workers actually have

FOH Efficiency Variance.

As per time		As per output	
Std hrs for Actual output	xxx	Std units in Actual hrs worked	xx
(-) Actual hrs worked	(xxx)	- Actual output	(xx)
	xx		xx
x A.R/hr	xx	x A.R/unit	xx
	xxx		xx

How many hours workers Should have worked for Actual output
&
How many hours workers Actually worked.

How many units workers Should have produced in Actual hrs worked
&
How many units workers Actually produced.

FOH gdls time var.
gdls/hr x A.R/hr

⇒ VOH Cost Variance.

(Std total VOH - Actual total VOH)

[How much VOH we should have & How much VOH we actually have]

VOH Expenditure Variance

(Std VOH Rate - Actual VOH Rate) x Actual hrs

At what Rate we should have & at what Rate we actually have

VOH Efficiency Variance. #①

(Std hrs - Actual hrs) x Actual Rate

How many hrs we should & How many hrs we actually

⇒ Note: 1. Hours for VOH is same as labour.

2. unless other wise specified we should consider Net hours.

#① All Efficiency Variance are exactly same only difference is Rate difference. which means if we have any one Efficiency Variance & Rate/hr of Lab, VOH & FOH we can Easily find out All other Efficiency Variance.

⇒

Sales Variance.

(Std total Sales - Actual total Sales)

[How much total sales we should have & How much total sales we actually did]

Sales Price Variance #(2)

[Std S.P.P.U − Actual S.P.P.U] × Actual units

[At what price we should have & at what price we actually have]

Sales Volume Variance #(3)

[Std units − Actual units] × Std S.P.P.U.

[How many units we should & How many units we actually]

Sales Mix Variance #(3)

[Std mix in Actual Qty − Actual mix in Actual Qty] × Std S.P.P.U

[Keep base of Actual Qty & Std Ratio → Actual Ratio]

Sales Qty Variance #(1)

[Std total units − Actual total units] × Avg S.P.P.U

[In totality how many units we should have & how many units we actually have]

Sales mkt size variance #(4)

Std mkt size.	xx
[check Std data only]	
− Actual mkt size	(xx)
↑ in mkt size	xx
× Std share	x
↑↓ in Sales due to size	xx
× Avg S.P.P.U	x
	xx

[What was mkt size in std & what is current mkt size multiply std share]

Sales mkt share variance #(4)

Actual mkt size.	xx
× Std share	xx
[Std share in Actual size]	xxx
(−) Actual Sales [share]	(xxx)
↑↓ in sales due to share	xxx
× Avg S.P.P.U	xx
	xxx

[Std share in Actual size − Actual sales [i.e Actual share in Actual size]]

Profit Variance

(Std total Profit + Actual total Profit)

(How much profit we should have earned)

(How much profit we actually earned)

A) N.P. var. due to Δ in Sales (compute (1) & (2))

B) N.P. Var. due to Δ in Cost.
(Std C.P.U - Actual C.P.U) × Act. units

Analysis all Cost Variance.

(1) N.P. Variance due to Δ in S.P. #2
(Std S.P.P.U - Actual S.P.P.U) × Actual units
(Same as S.Price variance)

(2) N.P. Variance due to Δ in Sales volume. #3
(Std units - Actual units) × Std Profit P.U.
[How many units we should have and how many units we actually have × Std profit]

#3 N.P. Variance due to Δ in Sales mix
(Std mix in Actual Qty - Actual mix in Actual Qty) × Std Profit Per unit
(Same as Sales mix but at std profit)

#4 N.P. Var. due to Δ in Sales Qty.
(Std total units - Actual total units) × Std Avg Profit P.U.
(Same as sales Qty but at Std Avg profit P.U.)

#4 N.P. Variance due to Δ in Sales mkt size

#4 N.P.V ariance due to Δ in mkt share.

#② Exact Exactly Same.
└ Same to same

#③ Similar unit wise.
└ same unitwise → co relate with Std Profit %.

#④ Similar in total unit level
i.e totality.
└ Same in totality co relate with profit % ge of co-

⇒ Biggest Hint ⇒ Identify Variance and convert it into JKSC format as follows.

⇒ Material cost

	Std data.			Revised std : xx			Actual data : xxx		
	Qty/Kg	@	Amt	Qty/Kg	@	Amt	Qty/Kg	@	Amt
	xx	x	xx	xx	x	xx	xx	x	xx

⇒ Labour & Variable o'head

	Std			Revised std : xx			Actual : xxx		
	Hrs	@	Amt	Hrs	@	Amt	Hrs	@	Amt
Labour	xx	x	xx	xx	x	xx	Paid xx	x	xx
							-Idle (x)		
							worked xx		
Variable o	xx	x	xx	xx	x	xx	xx	x	xx

Note: For Fixed o'head, Sales & Profit we will never prepare Revised std for Actual output. as they will be for a particular period.

⇒ Fixed o'head.

	Std	Actual
Days	xx	xx
units	xxx	xxx
o'head	xxx	xxx
Hrs	xxx	xxx
Sdd hrs		xx

⇒ Note: very important to get your standard data first.

⇒ Question may trick by giving std hrs only & no unit but with help of A.R/hr & A.R/unit & hrs/unit we can get all the std data.

⇒ Sales

Std data			Actual data		
Units	@	Amt	Units	@	Amt.
xx	x	xxx	xx	x	xxx
xx	x	xxx	xx	x	xxx
xx		xxx	xx		xxx

⇒ Profit: [As per Absorption Costing]

Std: Product: S.P.P.U − C.P.U = P.P.U x units = Profit
xx − xx = xx x xxx = xxx

Actual Product: S.P.P.U − C.P.U = P.P.U x units = Profit
xx − xx = xx * xxx = xxx

[As per marginal costing]

⇒ Std : Product : S.P.P.U − V.C.P.U = Contp.u × units = Cont − F.C =
XX − XX = XX * XX = XX − XX = XX

= Actual

S.P.P.U − V.C.P.U = Contp.u × units = Cont − F.C = Profit
XX − XX = XX * XXX = XXX − XX = XXX

⇒ Note if profit Variance is as per Marginal Costing for FOH cost variance we compute only FOH Expenditure Variance.

⇒ General Tips.

- If Reconciliation of Profit is asked immediately make Reconciliation Statement.

Std profit XXX

A] N.P. variance due to △ in sales.
-> N.P. variance due to △ in S.P.
-> N.P. variance due to △ in Sales Volume.

B] N.P. variance due to △ in cost
-> Mat Cost Variance
- mat pric
- mat usage

-> Lab. Cost Variance
- Lab Rate
- Lab ~~time~~ Eff.

-> VOH Cost Variance
- VOH Exp.
- VOH Eff.

⇒ FOH Cost Variance
- All

Actual Profit XX

⇒ If two years data is given & profit Variance is to be computed. then take year 1 as Std.

↳ If S.P.P.U is not given & units are not given but only % of increase is given ⇒ Assume S.P.P.U as 100 and proceed with variance.

⇒ If WIP stock is given.

↳ Compute Equivalent units

↳ = WIP unit × D.O.C.

→ Revised std will always be computed for Equivalent completed unit which may be different for Mat / Lab / O'h.

Transfer Pricing

⇒ Transfer pria will mostly decided by Transferor so always think from Transferor point of view. But at the some time Transferee have right to accept it or not and how much qty.

⇒ Transferor

- Does not have External mkt
  - Total Cost plus [VC + F.C] as he do not have any other source for Recovery of Fixed cost.
- Does have an External mkt.
  - Idle capacity
    - Yes
      - Variable Cost [when most of capacity is used by outside mkt]
      - Variable Cost plus Some % of Fixed Cost [when outside mkt demand is around 50-60%.]
      - Variable Cost plus Share of Profit
    - No.
      - mkt pria
      - Negotiated Price. [mutually fixed]

⇒ If in Exam theory question is asked Refer short and answer.

⇒ Two type of questions.

- 1. Compute Division wise & overall profitability.

		Transferor Div	Transferee Div	Co-
I	Sales			
	To outsider	xxx	xxx	xxx
	To Transferee div.	xxx	–	–
		I xxx	xxx	xxx
II	Cost			
	⇒ Own cost			
	Variable cost	xx	xx	xx
	Fixed cost.	xx	xx	xx
	⇒ Transfer price	–	xx	~~xx~~
		II xxx	xxx	xxx
	Profit/(Loss) I-II	xxx	xxx	xxx

2. Decide Transfer price or Negotiate or Range of Transfer price.

- Note down all Expense from Transferor point of view.
- Also Explore opportunity i.e Sales to outsider.
- For Transfer price → minimum → Variable cost & maximum → Var. Cost + Cont. from outsider.
- while setting Transfer price do evaluate options available with transferee. as he will not pay more than that.
- Also look for some specific Expense which will incur or not incur if transferred to Internal Division.

Transportation.

Assignment => one to one

Transportation => one to many.

⇒ **Basic Requirement.**

- Problem must be Feasible.
  i.e no of units demanded = no. of units Availaible.
  If not feasible then we will introduce dummy Row OR dumy column with Ficticious availaibility or fictician demand.

- Minimisation.
  Same as Assignment.

If problem is neither feasible nor minimisation than in transportation preferably we will first ~~Convert~~ make problem feasible by introducing Dummy & then covert into minimisation.

⇒ Steps.

I. Initial Basic Feasible Solution.

- North West Corner Rule
  [start from top most left corner]
- Row minima.
- Column minima.
- Least cost method.
  [start from least cost of entire matrix]
- Vogels approximation method.

→ Compute Penalties for Row & Columns.
[i.e Least Cost − Next Least Cost]
→ Penalty is cost we will pay if we do not choose that path.
→ Enter from Highest Penalty and allocate at its least cost subject to requirement and availability whichever is lower.
→ After an allocation either Row or Column or both will exhaust.
→ For next allocation. Compute penalty again.
→ If there are more than one highest penalty Enter from that Row or column which allows highest allocation at its least cost.

Step II. Test of degeneracy.

No. of allocations = m + n − 1

m: no. of Rows, n: no. of column.

If above condition is satisfied solution is not degenerated.

If above condition is not satisfied solution is degenerated.

To Remove degeneracy we will introduce Epsilon (ε) at least cost from where loop cannot be formed. i.e least independent cell

Condition for degeneracy.

whenever after an allocation Row & column both get exhausted, than degeneracy is bound to occur.

Step III: Test of optimality

Objective

1. Confirm whether solution is optimum or Not

2. If solution is not optimum than make it optimum.

1. Confirm whether solution is optimum or Not.

- We will Evaluate unallocated cell by computing Cell Evaluation

C.E = Cost of unallocated − Cost of Allocated
↓ ↓
Cost − (U+V)

U = Cost − V
V = Cost − U

[Note U & V are to be computed only for Allocated cells]

⇒ Initially we may not have any value for Either U or V, we shall take any of the one value as Zero to start.

⇒ Even if one Cell Evaluation has negative value ⇒ Solution is not optimum.

2. If Solution is not optimum than we will make it optimum.

- To Modify distribution we will draw LOOP.
  - Start from highest −ve C.E.
  - ↓ ↑ or → ← but not diagnol
  - Can take turn only from allocated.
  - Close Loop.

- Put "+"ve sign from where we start & adjacent vertice opposite sign.

"+" → Give "−" Take.

- Modify distribution by least allocation from where loop cannot be formed.