ECONOMIC ORDER QUANTITY (EOQ)

– How Much to order in single order so that Carrying & Ordering cost are minimized Assuming Total Annual Purchase Cost remain Same.

1. Ordering cost (Cost of placing an order),
2. Carrying cost (cost of keeping material safe and usable till use in production) and
3. Purchase cost (Quantity purchased x price per unit)

Carrying Cost (%) = Insurance cost (%)+interest cost(%)+storage space cost(%)+obsolescence cost rate(%)

- Carrying cost per unit per annum normally remain same.
- Carrying cost shall change if it is given as a % of material price and material price keeps on Changing

Formula $Q = \sqrt{\frac{2 \times A \times O}{C}}$ Derivation Covered in class

Annual Ordering cost = Total number of orders in a year X Ordering cost per order

$$= \frac{\text{Annual requirement of raw material (A)}}{\text{Quanity ordered each time (Q)}} \text{ X Ordering cost per order (O)} = \frac{A \text{ X } O}{Q}$$

Annual carrying cost = Average Inventory X Average carrying cost per unit

$$= \frac{\text{Quantity ordered each time (Q)}}{2} \text{ X Avg. carrying cost per unit (C)} = \frac{Q \text{ X } C}{2}$$

Frequency of order

FOO is the time gap between placing two consecutive orders e.g.

$$\text{FOO} = \frac{\text{Total number of days in a year}}{\text{Total number of orders}}$$

Lead Time:

- it is time gap between date of placing the order with supplier and date of receipt of ordered material e.g. if order is placed on 4th Nov. 2016 and material is received on 8th Nov. 2016 then the lead time is 4 days.

Re-order Level

- When to Order
- It is that level of stock of raw material at which a fresh order for raw material should be placed otherwise the firm may face stock-out situation. This level lies between maximum and minimum level.

A Car tank petrol normal full capacity is 25 litre.
Reserve level is 5 litre.

Formula 1 :- Maximum Usage X Max lead time
Formula 2 :- Minimum Stock + Avg. Usage X Avg. Lead Time
Formula 3 :- Safety Stock + Avg. Usage X Avg. Lead Time

Minimum Level:

- It is that level of stock below which stock in hand of raw material should not be allowed to fall.

Formula
F1 - Re-order Level – Avg. Usage X Avg. Lead Time OR
F2 - Max. Lead Time X Max. Usage – Avg. Lead Time X Avg. Usage
OR
F3 - Safety Stock

Maximum level:

- It is that level of stock above which stock in hand of raw material should not be allowed to exceed. Like 25 litre in car petrol.

F1 - Re-order Level + Re-order quantity – Minimum Usage X Minimum Lead Time.

Average Stock Level

Formula 1:-
Avg. stock held by an organization

$$= \frac{\text{Max.Stock Level+Minimum Stock Level}}{2}$$

Formula 2 :-

$$= \text{Min. Stock Level} + \frac{\text{Re-order Quanity}}{2}$$

Danger Level:-

- It is the level at which raw material kept for emergency is used for production of FG (Normal issues of raw material is not possible).

When all petrol in car is used. Now car is running on reserve. This is danger level.

Danger Level = Avg. Usage X Max. Lead Time for emergency purchase

Material Turnover Ratio / Inventory Turnover Ratio for raw material

MTR :- It is a ratio between raw material consumed during a year and average stock of raw material maintained during the year.

$$\text{MTR Formula} = \frac{\text{Raw material consumed during a year}}{\text{Avg.stock of raw material}}$$

$$\text{Avg. stock of raw material} = \frac{\text{Opening Stock + Closing stock}}{2}$$

Raw Material holding period or Inventory Turnover period:- it is a ratio between No. of days/months in a year and MTR.

$$\text{Formula} = \frac{\text{365 Days or 12 months}}{\text{Material Turnover Ratio}}$$

It tell number of days material is kept (holded) in godown before further use.
- Low MTR means High RM holding period which means high carrying cost hence unfavourable. (RM called slow moving)
- High MTR means low RM holding period which means less carrying cost hence favourable.(RM Called fast moving)

Valuation of raw material

while calculating per unit cost of raw material purchased, some items are considered as follows:-

1. Trade Discount	Deduct from purchase price
2. Quantity Discount	Deduct from purchase price
3. Cash Discount	Not Deduct from purchase price since it is finance benefit.
4. Road Tax/Toll Tax / Octroi / Entry Tax	Add to purchase cost
5. GST Integrated GST - paid on inter-state supply of goods and services State GST – Paid on intra-state supply of goods and services Central GST – Paid on mfd& supply of goods .	Add to purchase cost if no input tax credit availed. Unless specifically mentioned in question, it will be excluded from cost of purchase assuming that credit is available
6. Demurrages / Detention Charges / Fine / Penalty	Deduct from purchase price since it is a penalty
7. Insurance Cost / Comm. / Brokerage Paid / Freight Inwards	Add to purchase cost
8.Cost of containers (if specifically charged)	• Add to purchase cost if it is non-returnable. • Don't add to purchase cost if it is returnable.
9.Normal Loss	Good units shall absorb cost of normal loss of material.

Note:-Cost per unit = $\frac{\text{Total Cost}}{\text{Total units - normal loss units}}$

How to Calculate cost of material consumed and cost of closing stock of material if material purchase prices keeps on changing
3 methods

1. FIFO (First in First Out):- Material issued for production shall be priced at the price of material purchased first till its quantity exhausts. When the quantity exhausts, next price shall be used as basis.

2. LIFO (Last in First Out):-Material issued for production shall be priced at the price of material purchased LAST till its quantity exhausts. When the quantity exhausts, previous price shall be used as basis.

3. Weighted Average method:- With every receipt of material, price is averaged and this averaged price used for issue of material till next receipt of material. On next receipt of material, average price changes. Used when difficult to identify material physically e.g. petrol storage in a tank.

Treatment of normal and abnormal loss of units in valuation

a. Normal Loss in units:- Price per unit of remaining material shall be increased.
b. Abnormal loss in units:- it shall be treated as issue of material. Cost of material lost shall be charged to costing P&L A/c as loss.

If given in question "Shortage will be charged as overhead" then it means cost of such issues shall be treated as overhead cost (material Cost became indirect material cost). It is neither normal loss nor abnormal loss.

ABC ANALYSIS

Practical steps to classify material in category A, B and C

Step 1:- Calculate value of each raw material by multiplying annual consumption of each raw material by its unit price.
Step 2:- Calculate total value of all raw materials.
Step 3:- Calculate % of value of each raw material in relation to total value of all raw materials.
Step 4:- Assign ranking to above calculated % i.e. Rank 1 to highest %, Rank 2 to second highest % and so on.
Step 5:- Classify items having nearly 70% value under category A, 20% value under category B and 10% value under category C.

Input-output ratio

It explains the relationship between input consumption and output produced using that input.

Formula = $\frac{\text{input}}{\text{output}} \times 100$

Example:-
suppose in a manufacturing process, output obtained is 200 kg from use of input of 260 kg then input-output ratio shall be 130%

i.e $\frac{260 \text{ kg}}{200 \text{ kg}} \times 100$

If input-output ratio is 130%, it means that
- Input consumption is 130% of the output.
- manufacturing loss is of 30% of output.

This ratio is treated as unfavorable if it is more than 100% while it is regarded as favorable if it is near 100%.

Material cost for 1 unit of output = Input – Output Ratio x Purchase price of RM

Stock-out situation

When a supplier could not supply ordered units of FG then such a situation is called Stock out situation.

Stock-out ratio (Finished Goods) =

= $\frac{\text{units for which order got cancelled}}{\text{total units for which orders received in whole year}}$

Inventory turnover ratio for FG (ITR for FG)

1. Inventory turnover ratio for finished goods

= $\frac{\text{Cost of sales}}{\text{Average inventory of finshed goods}}$

2. Average inventory of finished goods

= $\frac{\text{Opening stock of FG+closing stock of FG}}{2}$

3. Avg. stock of finished goods

= $\frac{\text{365 days or 12 months}}{\text{inventory turnover ratio of FG}}$

Low ITR for FG means High inventory holding period which means high holding cost hence unfavourable.

High ITR for FG means Low Inventory holding period which means low holding cost hence favourable.

Stock out cost = stock out units x Stock out cost per unit x probability (%).

CHAPTER 3 - EMPLOYEE COST AND DIRECT EXPENSES

Various Motivation schemes to boost up moral of workers

Various Motivation schemes to boost up moral of workers
There are 2 formula oriented bonus schemes as follows:-

1. Halsey Plan-

Total wages = hours worked x wage rate + hours saved x $\frac{50}{100}$ x hourly wage rate (Called Bonus)

2. Rowan Scheme-

Total Wages = hours worked x wage rate + hours saved x $\frac{\text{time taken}}{\text{time allowed}}$ x hourly wage rate (Called Bonus)

Example:- suppose time allowed for a work is 40 hours. Actual time taken by worker is 25 hours. Wage rate is Rs. 6 per hour. Calculate earnings for 25 hour time worked under Halsey and Rowan scheme?

Solution:- Time saved = 40 hour – 25 hour = 15 hour

Total Earning (Wages)	Hours worked x hourly wage rate + Hours Saved x Hourly wage rate x worker sharing ratio
Halsey	25 hour x Rs. 6 per hour + 15 hour x 50% x Rs.6 = 195
Rowan	25 hour x Rs. 6 per hour + 15 hour x $\frac{\text{25 hour}}{\text{40 hour}}$ x Rs. 6 per hour = Rs. 206.25

Direct labour cost per unit = $\frac{\text{total wages}}{\text{total unit produced}}$

Effective Wage Rate = $\frac{\text{total wages}}{\text{total actual hours worked}}$

Control Ratios

Activity Ratio = $\frac{\text{std hours for actual output obtained}}{\text{budgeted hours for budgeted production}}$ x100 = S/B

Capacity ratio = $\frac{\text{actual hours worked}}{\text{budgeted hours for budgeted production}}$ x100 = A/B

Efficiency ratio = $\frac{\text{std.hours for actual output obtained}}{\text{actual hours worked}}$ x100 = S/A

Treatment of Overtime

-Overtime means working over & above normal working hours e.g. suppose job time is 9Am to 5Pm and worker works from 9AM to 7Pm hence he is doing overtime working for 2 hours.

Cases	Treatment of overtime
1. When overtime working is always required due to shortage of labour. (Workers are not available in market hence overtime always needed by available workers)	Overtime payment is charged to product using inflated wage rate.
2. When worker has to work overtime since customer was demanding production instantly.	Overtime payment shall be charged to job (Recovered from customer)
3. When company had to overtime since working during day stopped due to abnormal situations e.g. breakdown of machine.	Overtime payment is charged as loss in costing profit and loss account.
4. When sometimes company to work overtime to fulfill production requirements.	Overtime payment is treated as production overhead. (Indirectly charged to products)

Treatment of Normal Idle Time &Abnormal idle Time

Idle time when worker keep on sitting without working. Idle time is categorized in 2 categories:-

1. Normal Idle Time:- Like lunch time, small 10 minutes beak etc.:- Cost of such normal idle time is absorbed into cost of product.
2. Abnormal idle time:- Like breakdown of machine, charged as a loss in costing P&L A/c. Cost of abnormal idle time is charged as loss to costing P&L Account.

Labour Turnover Rate (LTR)

Labour turnover means change in workers of company as follows

1. Old worker resigns from company if they get better opportunity (Called Resignation / Retirement / Left).
2. Old workers are fired from company if they does not perform well (Called retrenchment / discharged).
3. New workers are recruited to fill in vacancy due to resignation/retrenchment (Called Replacement). It is not due to expansion plan of company.
4. New workers are recruited as additional work force if company opened a new factory (Called Fresh recruitment).

High LTR means high cost of replacement and training to workers hence company always desires Low LTR.

There are 4 methods of calculating labour turnover rates as follows:-

1. Labour turnover under separation method :- $\frac{\text{No.of separations in a year}}{\text{Average no.of workers on the roll during the period}}$ x100

Separations (S) = Resignation + Retirement + left ++ retrenchment+ discharged

Note:- Average no. of workers on roll = $\frac{\text{workers on the beginning of the period+workers at the end of period}}{2}$

2. Labour turnover under replacement method = $\frac{\text{No.of replacements in the period}}{\text{Average no.of workers on roll during the period}}$ x100

Replacement (R)= New workers are recruited to fill in vacancy due to resignation/retrenchment
Replacement does not include those works who are engaged due to expansion scheme.

3. Labour turnover under accession method = $\frac{\text{No.of accessions in the period}}{\text{Average No.of workers on the roll during the period}}$ x100

Accession (A) = Replacement + Fresh recruitment

4. Labour turnover under Flux method

= $\frac{\text{No.of separtions in a year+ No.of accessions}}{\text{verage no.of workers on the roll during the period}}$ x 100

Since Accession includes both replacement and fresh recruitment.

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Chart Can Be Downloaded From purushottamaggarwal.com

Chapter 4 - Overheads Absorption Costing Method

Overheads Recovery Rates / Overhead absorption rate

Company use following methods to charging overheads cost to various products

a) Percentage of direct material cost

$$= \frac{\text{Amount of production overheads}}{\text{Direct material cost}} \times 100$$

b) Percentage of direct labour cost

$$= \frac{\text{Amount of production overheads}}{\text{Direct labour cost}} \times 100$$

c) Percentage of prime cost

$$= \frac{\text{Amount of production overheads}}{\text{Prime cost}} \times 100$$

d) Direct labour hours rate

$$= \frac{\text{Amount of production overheads}}{\text{Direct labour hours}} \times 100$$

e) Machine hour rate

$$= \frac{\text{Amount of production overheads}}{\text{Machine hours}} \times 100$$

Example The following information relates to the production department for a certain period in a factory:

Direct Materials consumed	Rs. 75,000
Direct Wages	Rs. 50,000
Production Overheads	Rs. 1,50,000
Labour Hours	30,000 hours
Machine Hours	25,000 hours

For one Order No. 101 carried out in the department during the period, the relevant data were:

Direct Material consumed	Rs. 14,000
Direct Wages	Rs. 11,000
Machine hours worked	5000 hours
Labour hours worked	7000 hours

Required: Prepare a Comparative Statement of Cost of this order by using the following methods:
(i) Direct Material Cost Percentage;
(ii) Direct Labour Cost Percentage;
(iii) Prime Cost Percentage;
(iv) Labour Hour Rate;
(v) Machine Hour Rate.

Solution:
Step 1 Computation of Production Overhead Rate

(I) Direct Material Cost Percentage

$$= \frac{\text{production overheads}}{\text{direct material cost}} \times 100 = \frac{1,50,000}{75,000} \times 100$$

= 200% of DMC

(ii) Direct Labour Cost Percentage

$$= \frac{\text{production overheads}}{\text{direct labour cost}} \times 100 = \frac{1,50,000}{50,000} \times 100$$

= 300% of DLC

(III) Prime Cost Percentage

$$= \frac{\text{production overheads}}{\text{Prime Cost}} \times 100 = \frac{1,50,000}{1,25000} \times 100$$

= 120% of Prime Cost

(iv) Labour Hour Rate

$$= \frac{\text{production overheads}}{\text{direct labour hour}} = \frac{1,50,000}{30,000}$$

= Rs.5 per labour hour

(v) Machine Hour Rate

$$= \frac{\text{production overheads}}{\text{Machine Hours}} = \frac{1,50,000}{25,000}$$

= Rs.6 per machine hour

Step 2 Comparative Statement of Cost of Order No. 101

Particulars	DMC%	DLC%	Prime Cost%	Direct Labour Hour Rate	Machine Hour Rate
	Rs.	Rs.	Rs.	Rs.	Rs.
Direct Material Cost	14,000	14,000	14,000	14,000	14,000
Direct Labour Cost	11,000	11,000	11,000	11,000	11,000
Prime Cost	25,000	25,000	25,000	25,000	25,000
Production Overheads 200% of DMC	28,000	—	—	—	—
300% of DLC	—	33,000	—	—	—
120% of Prime Cost	—	—	30,000	—	—
@Rs.5 per Direct Labour Hour	—	—	—	35,000	—
@Rs.6 per Machine Hour	—	—	—	—	30,000
	53,000	58,000	55,000	60,000	55,000

Allocation of overheads VS apportionment of overheads:-

Allocation means charging a full amount of overhead directly to a department for which this amount has been incurred.

For example, suppose in factory there are 3 departments namely Dept. 1, Dept. 2 and Dept. 3. A supervisor is appointed in each department and salary paid to supervisor of dept. 1 is Rs. 10,000, salary paid to supervisor of dept. 2 is Rs. 15,000 and salary paid to supervisor of dept. 3 is Rs. 20,000. Hence total Rs. 45000 has been paid for whole factory. Now Rs. 10000 will be charged to Dept. 1, Rs. 15000 will be charged to Dept. 2 and Rs. 20000 will be charged to Dept.3.

Apportionment of overheads:- when separate identification of overhead department-wise is not possible then we have to divide cost of whole overheads among all departments on logical basis then it is called apportionment of overheads.

For example, factory rent paid for whole factory as whole shall be divided to all departments on the basis of floor area occupied.

Common Expense, i.e. Overhead	Basis of Apportionment(Multiple Options)
Rent of Factory Building	• Area of Deptt. If Area Given • Equal if area not given
Factory Lighting Expenses	• Number of Light Points or • Area if light points not given
Depreciation of machines	• Number of machines of each deptt if value not given • Value of machines
Power for Machines	• Horse Power (HP) Rating or • HP Rating × Machine Hours • Machine hours
Indirect Wages	• Direct Wages

Treatment of under/over absorption (Recovery) of overheads:-

Meaning of unabsorbed OH:- When overhead cost has been incurred more and overhead has been recovered less

Under absorption of OH means that amount of OH absorbed over products is less than the amount of actual OH incurred.
Over absorption of OH means that amount of OH absorbed over products is more than the amount of actual OH incurred.

Methods to dispose off
Method 1:- Charge under/over absorbed OH to costing P&L Account
Method 2:- Charge under/over absorbed OH to WIP, Finished goods- stock and units sold by using supplementary rate.

Note:- When units are not given then charge in ratio of their value.

Note 1:- supplementary rate

$$= \frac{\text{unabsorbed or over absorbed OH}}{\text{Total production in units including equivalent units of WIP}}$$

Note 2:- The under absorbed overhead relating to inefficiency or defective planning or defective production policy is always charged to profit and loss account as loss.

Note 3:- For calculation of unabsorbed / over absorption OH, Actual overhead incurred should not include non-recurring expenses
- amount paid to worker as per court order
- previous years' expenses booked to current year
- wages paid in strike period
- obsolete stores written off.

Chapter 4 - Overheads Absorption Costing Method

Re-distribution of overheads

Method 1 - Repeated / continuous distribution method:- Following steps shall be applied under this method assuming 3 production deptt. As P1, P2, P3 and 3 service deptt. S1, S2 and S3.

S.1Original Cost of S1 is distributed among P1, P2, P3, S2 and S3 in given %.
S.2Original Cost of S2 Plus shared cost from S1 is distributed among P1, P2, P3, S1, S3 in given %.
S.3Original cost of S3 plus shared cost from S1 & S2 is distributed among P1, P2, P3, S1 and S2 in given %.
S.4Repeat the above step -1, step – 2 and then step -3 until cost of S1, S2 and S3 becomes small figure. (Rs. 1 or Rs. 2). Now distribute this small figure over P1, P2 and P3

Method 2 - Trial and error method:-Following steps are applied under this method assuming 3 production deptt. As P1, P2, P3 and 3 service deptt. S1, S2 and S3.

S.1 Original Cost of S1 is distributed among S2 and S3 in given %.(1:2) (No amount shall be reduced from S1)
S.2 Original Cost of S2 along with shared cost from S1 is distributed among S1 & S3 in given %.(1:2) (No amount shall be reduced from S2)
S.3 Original Cost of S3 along with shared cost from S1 & S2 is distributed among S1 & S2 in given %.(1:2) (No amount shall be reduced from S3)
S.4 Repeat the process of distribution again beginning with S1 until the additional amount becomes small amount (Rs.1 or Rs.2)
S.5 Now distribute the [100% - Share of other Service Deptt.] cost of S1, S2 and S3 among P1, P2 and P3 only once.

Method 3 - Simultaneous equation method:- Following steps are applied under this method assuming 3 production deptt. As P1, P2, P3 and 2 service deptt. S1 and S2.
S.1Make2 equation to show the total cost of S1 & S2 including its share (%) in S2 & S1 respectively.
S.2Solve these 2 equationsto find out the cost of S1 and S2.(Called Calculated Cost)
S.3This calculated cost of S1 and S2 is then distributed only once over production deptt and service deptt. in given %.

Method 4 - Step ladder method:- following steps are applied under this method assuming 3 production deptt. As P1, P2, P3 and 4 service deptt. S1, S2, S3 & S4.
S1 provide services to P1, P2, P3, S2, S3 & S4.
S2 provide services to P1, P2, P3, S3 & S4.
S3 provides services to P1, P2, P3 and S4.
S4 provides services to P1, P2 & P3.

S.1 Original Cost of S1 is distributed among P1, P2, P3, S2, S3 & S4.
S. 2 Original Cost of S2 along with shared cost from S1 is distributed among P1, P2, P3, S3 & S4.
S.3 Original Cost of S3 along with shared cost from S1 & S2is distributed among P1, P2, P3 and S4.
S.4 Original Cost of S4 along with shared cost from S1, S2& S3is distributed among P1, P2 & P3.

Different Capacity

Meaning	It is expressed in terms of Units of product e.g. 100 cars per day [20 costing Question per day] & Production Hours e.g.100 hours per day [Study 10 hours per day]
Types 1. Maximum / Rated Capacity	It refers to the maximum possible production capacity of a factory which can never be achieved practically and it is only a theoretical capacity. Example A factorycan work 8 hours per day. Here, Maximum capacity = 365 days × 8 = 2,920 hours
2. Practical Capacity	It refers to the maximum capacity of a factory reduced by capacity lost due to Normal repairs& maintenance, Sundays, Holidays etc. Thus, Practical capacity = Maximum capacity – Normal loss of capacity Example A factory can work 8 hours per day during a six day week and remains closed for 18 holidays (exclusive of Sundays) during a year. Average idle hours per month is 20 for cleaning and maintenance.

Maximum capacity (365 days × 8 hours)		2,920 hours
Less: Idle capacity due normal reasons:		
Sundays (52 × 8)	416 hours	
Holidays (18x8)	144 hours	
Maintenance (20 × 12)	240 hours	800 hours
Practical Capacity		2,120 hours

3. Normal Capacity / Average Capacity	It refers to average of capacity utilised of factory during one full business cycle which may extend over 3 to 5 years ignoring the abnormal year of highest and lowest utilisation. Example Actual Capacity during the last 5 years was: I 30,000 II 38,000, III 31,000 IV 30,800, V 26,900. Here year II being two high and Year V being too low are to be ignored. Hence, Normal Capacity = Average of (30,000 + 31,000 + 30,800) = 30,600 hours.
4. Actual Capacity	It refers to the capacity actually utilised during a given period.

Machine hour rate

Machine hour rate $= \dfrac{\text{Amount of production overheads}}{\text{Machine hours}}$

- All expenses related to operating of machine are divided into fixed/standing charges and running/machine expenses.
- Comprehensive machine hour rate
=Simple machine hour rate + direct wages per machine hour $\left(\dfrac{\text{Total Direct wages}}{\text{Total machine hours}}\right)$

STATEMENT SHOWING THE COMPUTATION OF MACHINE HOUR RATE

Particulars	Amount (Rs.)
A. Fixed/Standing Charges:	
(a) Rent & Rates	XXX
(b) Heating & lighting cost	XXX
(c) Supervision cost	XXX
(d) Insurance cost	XXX
(e) Department & general overheads	XXX
(f) Sundry Shop Supplies	XXX
(g) Depreciation of factory – building	
Total Fixed/Standing Charges	XXX
B. Machine Expenses per hour:	
(a) Depreciation = $\dfrac{\text{original cost + installation exp. - scrap value}}{\text{effective useful life (in hours)}}$	
(b) Powerconsumed cost / Electricity	
(c) Repair & Maintenance	
(d) Lubricating oil & Consumable stores	
(e) Other running expenses	
C. Machine Hour Rate	

Note:- Calculation of Effective machine hours

Particulars	Hours
Maximum Capacity (365 days x 8 hours in a day)	XXX
Less:- Hours spent on holidays, festivals, Sundays, repair & maintenance	(XXX)
Practical capacity (In hours)	XXX
Less:- Set up time (If unproductive)	(XXX)
Effective machine hours	XXX

Note:- if set-up time is considered productive then it shall not be reduced.

Chapter 5 - Activity Based Costing

Absorption Technique

Overhead recovery rate (ORR)

- Budgeted Output $\left(\text{Overhead Recovery Rate} = \frac{\text{Budgeted Overhead}}{\text{Budgeted Output}}\right)$

- Budgeted Labour hours $\left(\text{Overhead Recovery Rate} = \frac{\text{Budgeted Overhead}}{\text{Budgeted Labour Hours}}\right)$

- Budgeted machine hours $\left(\text{Overhead Recovery Rate} = \frac{\text{Budgeted Overhead}}{\text{Budgeted Machine Hours}}\right)$

- Budgeted material cost $\left(\text{Overhead Recovery Rate} = \frac{\text{Budgeted Overhead}}{\text{Budgeted Material Cost}} \times 100\right)$

- Budgeted Labour cost $\left(\text{Overhead Recovery Rate} = \frac{\text{Budgeted Overhead}}{\text{Budgeted Labour Cost}} \times 100\right)$

- Budgeted prime cost $\left(\text{Overhead Recovery Rate} = \frac{\text{Budgeted Overhead}}{\text{Budgeted Prime Cost}} \times 100\right)$

Under ABC Costing

All overheads are divided into 2 parts:-

1. Overhead which is activity oriented i.e. set-up cost is indirect cost (OH) which will increase if number of set-ups on machine increases and vice-versa.

2. Overhead which is not activity oriented i.e. Factory rent, depreciation on machine on SLM. This overhead is apportioned among products using single recovery rate.

Steps in ABC system

1. Statement of Car Pool (Car Allocation) :- Group of overhead
2. Statement of Cost

Statement of Cost Pool

Overhead	Amount	Basis	No. of Activities	Cost per activity
Set up Cost	XX	No. of Set Ups	XX	XX
Inspection Cost	XX	No. of inspections	XX	XX
Stores Cost	XX	Material Cost	XX	XX
Other Cost	XX	Method of absorption (Output)	XX	XX

Chapter 6 - COST SHEET

Main Things

1. Never break sequence
2. One Format Based Chapter

Format to make Cost Sheet

Particulars	Amt (Rs.)	Total units
Opening stock of raw material	xxx	
Add:- Purchase of raw material including carriage inwards	xxx	
Less:- Closing stock of raw material	(xxx)	
Direct material consumed / DMC	xxx	Units produced
Direct Labour Cost	xxx	Units produced
Direct Expenses / Chargeable Expenses	xxx	Units produced
Prime Cost/Direct Cost	**xxx**	**Units produced**
Factory/works/Manufacturing/Production overhead	xxx	
Plus Opening stock of WIP	xxx	
Less closing stock of WIP	(xxx)	
Factory Cost	**xxx**	**Units produced**
Quality Control Cost	xxx	
Research & Development Cost (Process Related)	xxx	
Adm. Overheads (Related to Production Activity)	xxx	
Less:- Credit for Recoveries / Scrap / By –Products / Misc. Income	(xxx)	
Primary Packing Cost	xxx	
Cost of Production (For FG Produced)	**xxx**	**Units produced**
Plus opening stock of finished goods	xxx	
Less closing stock of finished goods	(xxx)	
Cost of goods Sold (For FG Sold)	**xxx**	**Units Sold**
Selling and distribution overhead	xxx	Units Sold
General Admin Overheads	xxx	Units Sold
Total cost / Cost of sales	**xxx**	**Units Sold**
Total Profit	xxx	
Total Sales	**xxx**	

Special Formulas

1. No. of units produced = Sales (units) + Closing Stock (units) – Opening Stock (units)
2. No. of units Sold = Opening Stock (units) + produced (units) – closing Stock (units)
3. While preparing the cost sheet, following amounts are ignored
   I. Income tax, cash discount, dividend, goodwill written off, any penalty, fine, demurrage
   ii. Abnormal cost

Special Note1- Interest & Other Finance Costs

- Interest, including any payment in the nature of interest for use of non-equity funds and incidental cost that an entity incurs in arranging those funds.
- Interest & finance charges are not included in cost of production
- Interest & finance charges shall be presented in cost statement as a separate item of cost of sales

Special Note 2 - Any type of subsidy/Grant/Incentive received/receivable shall be reduced from cost

Conversion cost

Conversion cost :- It means cost incurred to convert raw material into finished goods.

Method1 :- Conversion cost = direct labour cost + direct expenses + factory overheads
Method 2 :- Conversion Cost = Factory Cost – Direct material cost

Note :- Method 2 is applicable only when Opening & Closing WIP is not given.

Impact of a word in Costing solution

Example 1 Semi-variable overheads per annum at 75% capacity is Rs. 60,000

Case 1:- (it will increase by Rs. 4,000 per annum for increase of every 5% of the capacity utilisation or any part thereof)
Solution:-

Capacity Level	Annual Semi-variable OH
75%	60000
80%	60000+4000 = 64000
90%	60000+4000x3 = 72000
86%	60000+4000x3 = 72000

Case 2:- (it will increase by Rs. 4,000 per annum for increase of every 5% of the capacity utilisation thereof)
Solution:-

Capacity Level	Annual Semi-variable OH
75%	60000
80%	60000+4000 = 64000
90%	60000+4000x3 = 72000
86%	$60000+4000\text{x}2 + 4000 \text{ x } \frac{1\%}{5\%} = 68800$

Example 2

Particulars	Total Cost	Variable Cost	Fixed Cost
Administration OHs (75% Fixed)	150000	150000 x 25% = 37500	150000 x 75% = 112500
Administration OHs – Fixed (75%)	150000	$\frac{150000}{75\%}$ x 25% = 50000	150000

Meaning of Change in Labour efficiency & Its impact

Case 1:- When Labour Efficiency reduced
- Reduction in efficiency or workers means workers are producing less units in same time

Example: Suppose earlier worker was producing 4 units in 1 hour and we were paying him Rs.100 per hour then in such direct labour cost per unit shall be Rs.25 per unit.

If now question says that efficiency of worker has been reduced by 25%.
It means now worker is producing 3 units [4 units – 4 units x 25%] in 1 hour hence now direct labour cost per unit would be Rs 33.33 since we are paying worker on time basis i.e. Rs. 100 per hour.

Alternative way to calculate New DLC per unit
$\frac{\text{Old DLC per unit}}{100\%\text{-Reduction in Effciency}} = \frac{\text{Rs 25}}{100\%\text{-}25\%}$ = 33.33 per unit

Case 2:- When Labour Efficiency Increased
Alternative way to calculate New DLC per unit = $\frac{\text{Old DLC per unit}}{100\%\text{+ Reduction in Effciency}}$

CHAPTER 7 - INTEGRATED AND NON-INTEGRATED ACCOUNTS AND RECONCILIALITION OF PROFIT

3 golden rules of accounting

1. Debit the receiver and credit the giver
2. Debit what comes in and credit what goes out
3. Debit all exp. & losses and credit all revenues & incomes

Particulars	Receiver	Giver	Entry
Logic behind Above Entries			Debit the receiver Credit the Giver
On Transferring Direct Raw Material from store to Factory	Factory	Stores	WIP Ledger Control A/c Dr. To Stores Ledger Control A/c
On Transferring Finished Goods from factory to Warehouse (Also Called Factory Cost)	Warehouse	Factory	FG Ledger control A/c Dr. To WIP Ledger control A/c
On Transferring FG from Warehouse to Showroom (Also Called Cost of goods Sold)	Shop	Warehouse	Cost of Sales A/c Dr. To Finished Goods Ledger control A/c
On transferring Actual cost of Sales to Costing P&L A/c (Also Called Cost of Sales)			Costing P&L A/c Dr. To Cost of Sales A/c

General Ledger Adjustment A/c (GLA A/c) OR Cost Ledger Control A/c OR Nominal ledger control A/c

GLA account shall be used in place of account not opened while preparing cost sheet

Treatment of under and over recovery of overheads

Option 1 of Treatment :- Carry Forword & Set Off Next Year
• No Accounting Entry is made for this.

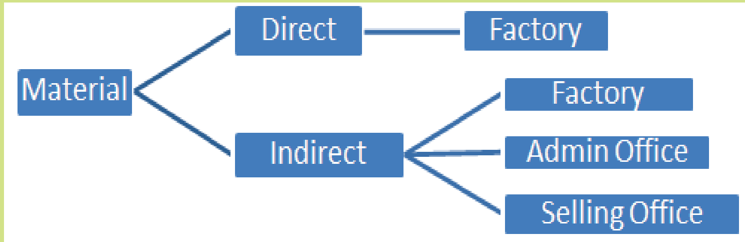
Option 2 of Treatment :-
• If management decides to charge the amount of under/over recovery of overheads in current year then current year's under/over recovery shall be transferred to current year's profit & loss account.

Journal Entry for Under – Recovery (Loss)

Costing P&L A/c Dr.	XXX
To Factory OH / Admin OH / Selling & Dist. OH A/c	XXX

Just reverse entry for over-recovery.

Journal Entries relating to Material



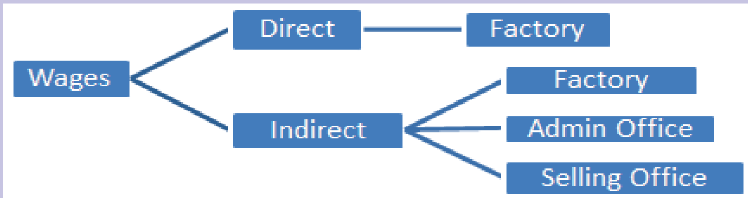
	Transaction Entry	Transfer Entry
Direct Material to factory	Stores ledger Control A/c Dr. To GLA A/c	WIP Ledger Control A/c Dr. To Stores ledger Control A/c (Wages incurred for production)
Indirect material at Factory / Admin. Office / Selling Office	Stores ledger Control A/c Dr. To GLA A/c	Factory OH Control A/c Dr. Office & Admin OH Control A/c Dr. Selling OH Control A/c Dr. To Stores ledger Control A/c

Note:- Raw material issued/used for repairs and maintenance means indirect materials for factory.

Journal Entries relating to Overheads

Particulars	Transaction Entry	Transfer Entry - Overheads charged/Recovered
Factory Overheads	Factory OH Control A/C Dr. To GLA A/C	WIP Ledger Control A/C Dr. To Factory OH Control A/C
Office & Admin Overheads	Office & Admn OH Control A/C Dr. To GLA A/C	FG Ledger Control A/C Dr. To Admin OH Control A/C
Selling & Distribution	Selling & Distribution OH control A/C Dr. To GLA A/C	Cost Of Sales A/C Dr. To Selling OH Control A/C

Journal Entries relating to wages



	Transaction Entry	Transfer Entry
Direct Wages to factory	Wages Control A/c Dr. To GLA A/c	WIP Ledger Control A/c Dr. To Wages Control A/c (Wages incurred for production)
Indirect Wages at Factory / Admin. Office / Selling Office	Wages Control A/c Dr. To GLA A/c	Factory OH Control A/c Dr. Office & Admin OH Control A/c Dr. Selling OH Control A/c Dr. To Wages Control A/c

Journal Entries relating to direct expenses

	Transaction Entry	Transfer Entry
Direct Expenses for factory	Direct Exp. Control A/c Dr. To GLA A/c	WIP Ledger Control A/c Dr. To Direct exp. control A/c

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CHAPTER 7 - INTEGRATED AND NON-INTEGRATED ACCOUNTS AND RECONCIALITION OF PROFIT

Important Notes

(a) Opening balances of raw material, WIP & Finished goods shall be shown on debit side of A/c and closing balances shall be shown on credit side of A/c.

(b) Opening balance of GLA A/c shall be shown on credit side and closing balance shall be shown on debit side.

Shortage in raw material

When raw material balance on physical checking is found to be less than raw material balance as per books then difference is called shortage.

Treatment as follows:-

If shortage is due to normal loss	Factory OH A/c Dr. To Stores Ledger Control A/c
If shortage is due to abnormal loss	Costing P&L A/c Dr. To Stores Ledger Control A/c
If shortage is due to non-recording of actual consumption	WIP Ledger control A/c Dr. To Stores Ledger Control A/c

Note:- In case of surplus, just reverse the entries.

Reasons of Difference

- Different basis of Overheads
  - In Costing – Overheads absorbed are shown
  - In Trading – Actual Overheads incurred are shown.
- Closing stock valuation
  - In Costing – Cl. Shock at cost
  - In Trading – Cost or Market Price whichever is lower
- Depreciation on machine
  - In Costing – based on life of machine or machine hours
  - In Trading – SLM Or WDV
- Some Financial Items only in financial e.g. Interest income, Dividend Income, Rental Income

Format to Make Reconciliation

Particulars	Plus Items	Minus Items
Profit / Loss as per cost Records		
Add:- Items demanding addition should be added here in plus items heading		
Less:- Items demanding deletion should be deducted here in minus items heading		
Total (Make Total of both the columns i.e. "Plus items and Minus Items"		
Profit/Loss as per financial records (Rs. XXX – Rs. XXX) = Rs. XXX		

Memorandum Reconciliation Account

- All Plus Column Items ----- Credit Side of MRA
- All Minus Column Items ---- Debit Side of MRA
- Difference shall be profit / loss as per financial records.

Example to Decide Addition/Deletion

Expense Side

	Amount (Rs.)	Implication (Other Items Assumed Constant)
An Exp. Charged in Cost	50,000	Profit as per costing will be less by Rs.10000
Same Exp. Charged in Trading	40,000	Profit as per financial will be more by Rs.10000
Difference	10,000	

Treatment
- If we use costing profit as starting point then we need to Add Rs.10000
- If we use trading profit as starting point then we need to Reduce Rs.10000

Revenue Side

	Amount (Rs.)	Implication (Other Items Assumed Constant)
An Revenue Item in Cost	Zero	Profit as per costing will be less by Rs.10000
Same Revenue Item in Finan.	10,000	Profit as per financial will be more by Rs.10000
Difference	10,000	

Treatment
- If we use costing profit as starting point then we need to Add Rs.10000
- If we use trading profit as starting point then we need to Reduce Rs.10000

Chapter 8 - JOB AND BATCH COSTING

JOB AND BATCH COSTING

Job Costing is that form of specific order costing under which each job is treated as a cost unit and costs are ascertained separately for each job. A job may consist of a job, product, contract, a service or any other specific order.

Batch Costing is that form of specific order costing under which each batch is treated as a cost unit and costs are accumulated and ascertained separately for each batch. Each batch consists of a number of like units.

Example:- Batch costing states that cost per unit shall be less as number of units increases and total cost of batch shall increase as number of units increases in a batch. Example Rs. 200 for 100 visiting cards while Rs.300 for 200 visiting cards etc.

JOB AND BATCH COSTING

Economic Batch Quantity (EBQ) (Similar as Economic order quantity)

EBQ refers to the optimum quantity batch at which Set up & Processing Costs and Carrying Costs are together minimised.

$$\text{E.B.Q} = \sqrt{\frac{2 \times \text{Annual Demand} \times \text{Set up cost per batch}}{\text{Cost of carrying per unit of production per annum}}}$$

CHAPTER 9 - CONTRACT COSTING

Value of work certified

Value of work certified:- It is expressed as a % of the contract price.
Example:- If contract price is Rs. 10 Lakh & work certified is 60% then value of work certified shall be 6 lakh (contract price x work certified as %)

Retention money

Retention money:- it is that portion of value of work certified which has not been paid by contractee and kept as security money for future defective work.

Retention money = Value of work certified – Cash received by contractor
Example:- suppose in above example, if Rs. 5 Lakh has been paid by contractee to contractor then retention money shall be 1 lakh.

Cost of work uncertified

Cost of work uncertified = Total cost incurred till date – Cost of work certified

Total Work Done (Total Cost incurred)	
Work certified (Cost incurred)	Work uncertified (Cost incurred)
Add:- Profit	Add:- Nothing
= Value of work certified	= Cost of work uncertified

Estimated Total Profit & Estimated Total Cost

Estimated Total Profit = Total Contract Price – Estimated Total Cost
Estimated Total Cost = Cost of Contract upto date + Costs to be incurred

Treatment of notional loss and estimated total loss

Treatment of notional loss and estimated total loss

- Notional loss shall arise when cost of work certified is more than value of work certified.
- Estimated total loss shall arise when total estimated cost of contract is more than total contract price.
- Excess of estimated total loss over and above notional loss is called anticipated loss.

The whole amount of notional loss and anticipated loss shall be recognized as loss & TF to costing P&L A/c.

Escalation clause

Escalation clause:- under this clause of a contract, rise in price of material and labour beyond standard price fixed is paid by contractee as extra amount along with contract price. Formula to Calculate escalation:-

For material:- Standard quantity x (Actual Price – Std. Price)
For labour:- Standard labour hours x (Actual Price – Standard Price)

Escalation clause does not cover increase in cost caused due to inefficiency or wrong estimation on part of contractor.
Reversely, de-escalation clause, contract price is reduced by downward trend in price of materials and rates of labour etc.

Accounting Entries

Accounting Entries	
Material issued from stores to contract Account	Contract A/c (Contract Number) Dr. XXX To Stores ledger control Account XXX
Material Purchased directly from supplier & used in contract Account	Contract A/c (Contract Number) Dr. XXX To General Ledger control Account XXX
Material Returned to stores	Store ledger Control Account Dr. XXX To Contract Account XXX
Material Returned to supplier	General Ledger Control A/c Dr. XXX To Contract Account XXX
Employee Labour Cost	Contract A/c Dr. XXX To Wages Control Account XXX
Direct Expenses of contract	Contract A/c Dr. XXX To Direct Expenses Account XXX
Indirect Expenses of contract	Contract A/c Dr. XXX To Overhead Account XXX
Depreciation on Plant & Machinery	Contract A/c Dr. XXX To Dep. On P&M A/c XXX

Material Turnover Ratio / Inventory Turnover Ratio for raw material

Contract A/c (For 1st Accounting Period) Format 1

Particulars	Rs.	Particulars	Rs.
To Materials Issued to site	XXX	By Materials at site (Closing Stock)	XXX
To Wages incurred (Paid + O/s – Prepaid)	XXX	By Materials returned from site i.e. returned to stores	XXX
To Direct Expenses (Paid + O/s – Prepaid)	XXX	By Bank A/c (Sale of Materials)	XXX
To Depreciation on Plant &Equipments	XXX	By Costing P&L A/c (Loss on sale)	XXX
To Office & Adm. Exp. Incurred(Paid + O/s – Prepaid)	XXX	By Cost of Contract (Works Cost) (B.F)	XXX
	XXX		XXX
To Works Cost	XXX	— Value of Work certified (Like Sale)	XXX
To Costing Profit & Loss A/c		— Cost of Work Uncertified (Like closing stock)	XXX
	XXX		XXX

Contract A/c (For 1st Accounting Period) Format 2

Particulars	Rs.	Particulars	Rs.
To Materials Issued to site	XXX	By Materials at site (Closing Stock)	XXX
To Wages incurred (Paid + O/s – Prepaid)	XXX	By Materials returned from site i.e. returned to stores	XXX
To Direct Expenses (Paid + O/s – Prepaid)	XXX	By Bank A/c (Sale of Materials)	XXX
To Depreciation on Plant &Equipments	XXX	By Costing P&L A/c (Loss on sale)	XXX
To Office & Adm. Exp. Incurred(Paid + O/s – Prepaid)	XXX	By Work-in-progress	
To Costing Profit & Loss A/c	XXX	— Value of Work certified (Like Sale)	XXX
		— Cost of Work Uncertified (Like closing stock)	XXX
	XXX		XXX

Contract A/c (For 2nd year)

Particulars	Rs.	Particulars	Rs.
To Work-in-progress b/d			
Value of Work Certified	XXX		
Cost of Work Uncertified	XXX'		
Remaining Portion same as in previous format			

Note: Fines & Penalties are not shown in the Contract Account.

BALANCE SHEET (Extract)

Liabilities	Rs.	Assets	Rs.
Capital	XXX	Land & Building (Less: Depreciation)	XXX
Profit & Loss A/c	XXX	Plant & Equipment (Less: Depreciation):	XXX
Outstanding Expenses	XXX	Materials : ——	
Contractee Cr. Balance	XXX	At Stores	XXX
		At Site	XXX
		Work-in-progress :	
		Value of work certified XXX	
		Cost of work uncertified XXX	XXX
		Cash & Bank Balance	XXX
		Prepaid Expenses	XXX

Why we need to make process A/c?

Process costing is applicable when 2 or more process are required in mfd a product.
We need it to calculate
- All cost incurred in each process.
- Cost of FG transferred to next process.
- Cost of FG directly sold in market & held as stock

2 types of losses arise in process costing:-
1. Normal loss:- loss which arise generally. Suppose 10,000 units are introduced in process & 2% is normal loss then 200 units will be normal loss units.
2. Abnormal loss:- if Actual loss is above normal loss. If in above example, 300 units are lost in processing then 100 units are abnormal loss.

Sometimes actual loss is less than normal loss. If in above example, only 150 units are lost in processing then 50 units are treated as abnormal gain.

Following A/cs are prepared in process costing

Following A/cs are prepared in process costing:-
1.Process A/c
2.Finished goods A/c
3.Normal loss A/c
4.Abnormal loss A/c
5.Abnormal gain A/c
6.P&L Account
7.Any other A/c as required in question.

Process Account

Particulars	Units	Amount	Particulars	Units	Amount
To material input	XX	XX	By normal loss A/c	XX	= Scrap value
To All Expenses incurred		XX	By abnormal loss A/c	XX	= Cost of good units
To Rectification cost of normal loss units		XX	By Next process A/c (units TF to next process)	XX	= Cost of good units
To Abnormal gain A/c	XX	= Cost of good units	By finished goods A/c (units held as stock + units sold in mkt)	XX	= Cost of good units
	XXX	XXX		XXX	XXX

Finished goods A/c / Finished stock A/c

Particulars	Units	Amount	Particulars	Units	Amount
To process A/c (TF from process A/c)	XX	= Cost of good units	By Sales	XX	= Sale value
To P&L A/c		Profit on sale	By balance C/d	XX	= Cost of good units
	XXX	XXX		XXX	XXX

Normal loss A/c

Particulars	Units	Amount	Particulars	Units	Amount
To process A/c (TF from process A/c)	XX	=scrap value	By Bank A/c (Note 1)	XX abnormal gain units	=scrap value
			By abnormal gain A/c	XX	= Bal. Fig.
	XXX	XXX		XXX	XXX

Note 1:- Sale of normal loss units cannot exceed actual loss units.

Abnormal loss A/c

Particulars	Units	Amount	Particulars	Units	Amount
To process A/c (TF from process A/c)	XX	= cost of good units	By Bank A/c	XX	=scrap value
			By P&L A/c		= Bal. Fig.
	XXX	XXX		XXX	XXX

Abnormal gain A/c

Particulars	Units	Amount	Particulars	Units	Amount
To normal loss A/c (TF from normal loss A/c)	XX	XX	By process A/c (TF from process A/c)	XX	= cost of good units
To P&L A/c		= Bal. Fig.			
	XXX	XXX		XXX	XXX

INTER-PROCESS PROFIT

When output of one process is transferred to next process not at cost but at transfer price. Transfer price means cost plus some profit.

Particulars	Cost (A)	Profit (B)	Transfer Price (A+B)
Opening stock	XXX	XXX	XXX
Add:-			
Direct Material cost	XXX		XXX
Direct Labour cost	XXX		XXX
Dierct Expenses	XXX		XXX
Cost from previous process	XXX		XXX
Prime Cost	**XXX(D)**	**XXX**	**XXX (E)**
Less closing stock	XXX (D X F / E)	XXX (Bal. Fig)	XXX (F)
Net Balance	XXX	XXX	XXX
Add:- Factory Overhead	XXX		XXX
Total Cost	**XXX**	**XXX**	**XXX**
Add:- costing P&L A/c (Profit)		XXX	XXX
Grand Total	**XXX**	**XXX**	**XXX**

Some Special Points

(a) No Selling & distribution OH, Adm. OH Since it is internal transfer of goods.

(b) Opening & closing stock in process 1 shall not include any profit since it has not been transferred from any previous process.

(c) Profit included in <u>opening stock of process II and onwards</u> is normally given in question. Hence we need not to calculate it.

(d) Costing Profit and loss Account

a. Shall be credited by unrealized profit on opening stock.

b. Shall be debited by unrealized profit on closing stock.

c. Shall be credited by profit of process A/c & finished goods A/c.

d. Bal. Fig. shall be net profit / loss

Prepare process A/c when Opening & closing WIP is given cost item wise.

We need to prepare additional 3 statements as follows:-
Statement 1: Prepare Statement of Equivalent Production
Statement 2: Prepare Statement of Cost per Equivalent Unit
Statement 3: Prepare Statement of Evaluation

St. of equivalent production

Equivalent production units (EPU) = No. of units x degree (%) of completion performed in current period
EPU is calculated separately for each element of cost e.g. material, labour &OH because % of completion with regard to each element of cost is different.

Example: Suppose 900 units are incomplete at end of year (Closing WIP) & degree of completion is: Material 80%, Labour 70%, Overheads 30% then EPU of closing WIP shall be
EPU for material cost = 900 units x 80% = 720 units
EPU for labour cost = 900 units x 70% = 630 units
EPU for OH Cost = 900 units x 30% = 270 units

Explanation:-
Material cost of 900 incomplete units = material cost of 720 completed units.
Labour cost of 900 incomplete units = labour cost of 630 completed units.
OH cost of 900 incomplete units = overheads of 270 completed units.

Input	Units	Output	Case 1 - Units	Case 2 - Units
Opening WIP	2000	Opening WIP now Completed	2000	2000
Units introduced in current year	10000	Units introduced in current period and completed	8000	8000
		Closing WIP	1000	1500
		Normal loss 8% of current period input	800	800
		Abnormal loss	200 (Bal.Fig.)	
		Abnormal gain		(300) (Bal. Fig)
Total	**12000**	**Total**	**12000**	**12000**

Degree (%) of completion performed in current period shall be
- (100% - degree of completion performed in previous period) for Opening WIP.
- 100% for units introduced in current period and completed
- As given in question for closing WIP
- Always ZERO for normal loss units
- As given in question for abnormal loss units. (100% if not given in question)
- Always 100% for abnormal gain units

Calculation of Normal loss Units
In exam Normal loss may be given as a % of Current Input, Total Input, Production or Units Processed.

Opening WIP	XXX
Add:- Units Introduced	XXX - Also Called Current Input
Total input units	XXX
Less:- Closing Stock	(XXX)
Units Processed / Production	XXX

St. of cost per equivalent production
Material cost per equivalent unit, labour cost per equivalent unit and overhead cost per equivalent unit is calculated

$$\text{Formula} = \frac{\text{Total cost}}{\text{Total equivalent units}}$$

St. of evaluation
Cost of units completed, closing WIP, abnormal loss units and abnormal gain units is calculated
Formula = No. of equivalent units x cost per equivalent unit.

Method 1 FIFO METHOD

FIFO means units transferred as 100% complete shall comprise all opening WIP and balance from units introduced in current period. Units Transferred = Opening WIP + Units Introduced and completed
Total Cost of units Transferred to next process = Cost incurred in previous period on opening WIP + Cost incurred in current period on Opening WIP + Cost incurred in current period on units introduced & completed

Statement 1 -> Statement of Equivalent Production:-

Input		Output		Material		Labour		Overheads	
Particulars	Units	Particulars	Units	% Completion	Units	% Completion	Units	% Completion	Units
Opening WIP	XXX	Opening WIP completed	XXX	XXX*	XXX - 1	XXX *	XXX - 2	XXX *	XXX - 3
Units introduced	XXX	Units introduced and completed [Units Transferred – Op.WIP]	XXX	100%	XXX - 4	100%	XXX - 5	100%	XXX - 6
		Closing **WIP**	XXX	XXX	XXX - 7	XXX	XXX - 8	XXX	XXX - 9
		Normal loss	XXX	---	—	--	---	---	—
		Abnormal Loss	XXX	XXX	XXX - 10	XXX	XXX - 11	XXX	XXX - 12
		Abnormal Gain	(XXX)	100%	(XXX)-13	100%	(XXX)–14	100%	(XXX)-15
Total	**XXX**	**Total**	**XXX**		**XXX–16**		**XXX–17**		**XXX-18**

*100% – Degree of Completion of Opening WIP in previous period

Statement 2 Statement of Cost per Equivalent unit

Particulars	Net Material cost (Rs)*	Labour Cost (Rs.)	Overheads (Rs.)
Cost (Rs.) (A)	XXX	XXX	XXX
Equivalent units (B)	XXX - 16	XXX — 17	XXX — 18
Cost per equivalent unit (A/B)	XXX - 19	XXX — 20	XXX — 21

* Net Material Cost = Material Cost – Scrap Value of Normal Loss

Statement3 Statement of Evaluation:

Particulars	Cost Elements	Equivalent Units A	Cost per Equivalent UnitRs. B	Cost of Equivalent UnitsRs (A x B)	TotalRs. (A X B)
Opening WIP					
Cost incurred inprevious period				XXX	
Cost incurred in current period :	Material	XXX - 1	XXX –19	XXX	
	Labour	XXX - 2	XXX –20	XXX	
	Overhead	XXX - 3	XXX - 21	XXX	
Units introduced & completed	Material	XXX - 4	XXX – 19	XXX	
	Labour	XXX - 5	XXX – 20	XXX	
	Overhead	XXX - 6	XXX - 21	XXX	
Total Cost of Units t/f to next process:					XXX - 22
Closing WIP	Material	XXX - 7	XXX – 19	XXX	
	Labour	XXX - 8	XXX – 20	XXX	
	Overhead	XXX - 9	XXX - 21	XXX	XXX - 23
Abnormal Loss	Material	XXX - 10	XXX – 19	XXX	
	Labour	XXX - 11	XXX – 20	XXX	
	Overhead	XXX – 12	XXX - 21	XXX	XXX - 24
Abnormal gain	Material	XXX – 13	XXX – 19	XXX	
	Labour	XXX – 14	XXX – 20	XXX	
	Overhead	XXX – 15	XXX - 21	XXX	XXX - 25

Process Account

Particulars	Units	Rs	Particulars	Units	Rs.
To Opening WIP	XXX	XXX	By Normal Loss	XXX	Scrap Value
To Direct Material		XXX	By Abnormal Loss	XXX	XXX - 24
To Direct Labour		XXX	By Process II A/c (Transfer to next process)	XXX	XXX - 22
To Factory Overheads		XXX	By Closing WIP	XXX	XXX - 23
To abnormal gain	XXX	XXX - 25			
	XXX	**XXX**		**XXX**	**XXX**

Method 2 – Weighted Average Method

Average method is used when it is not possible to identify opening WIP units in units transferred to next process
Average cost per equivalent unit is calculated

$$= \frac{\text{Cost incuured in previous period on Opening WIP+Cost Incurred in current period@-Scrap value of normal loss units}}{\text{Total Equivalent Units}}$$

Total Cost of units Transferred to next process = Equivalent Units x Average Cost per unit
Statement 1 -> Statement of Equivalent Production:-

Input		Output		Material		Labour		Overheads	
Particulars	Units	Particulars	Units	% Completion	Units	% Completion	Units	% Completion	Units
Opening WIP	XXX	Units transferred to next process	XXX	100%	XXX - 4	100%	XXX - 5	100%	XXX - 6
Units introduced	XXX	Closing WIP	XXX	XXX	XXX - 7	XXX	XXX - 8	XXX	XXX - 9
		Normal loss	XXX	—	--	----	–	–	---
		Abnormal Loss	XXX	XXX	XXX - 10	XXX	XXX - 11	XXX	XXX - 12
		Abnormal Gain	(XXX)	100%	(XXX)-13	100%	(XXX)–14	100%	(XXX) - 15
Total	**XXX**	**Total**	**XXX**		**XXX –16**		**XXX –17**		**XXX - 18**

Statement 2 Statement of Cost per Equivalent per unit

Particulars	Net Material Cost	Labour Cost	Overhead cost
Opening WIP – Cost (A)	XXX	XXX	XXX
Cost incurred in current period (B)	XXX	XXX	XXX
Less Scrap value of normal loss (C)	(XXX)	---	---
Total Cost (A+B-C)	**XXX**	**XXX**	**XXX**
Equivalent units	XXX – 16	XXX - 17	XXX – 18
Cost per equivalent unit	XXX – 19	XXX - 20	XXX – 21

Statement 3 -> Statement of Evaluation

Particulars	Elements	Equivalent UnitsA	Cost per Equivalent Unit Rs. B	Cost of Equivalent Units Rs (A x B)	Total Rs.
Units transferred to next process	Material	XXX - 4	XXX – 19	XXX	
	Labour	XXX - 5	XXX – 20	XXX	
	Overhead	XXX - 6	XXX - 21	XXX	XXX - 22
Closing WIP	Material	XXX - 7	XXX – 19	XXX	
	Labour	XXX - 8	XXX – 20	XXX	
	Overhead	XXX - 9	XXX - 21	XXX	XXX - 23
Abnormal Loss	Material	XXX - 10	XXX – 19	XXX	
	Labour	XXX - 11	XXX – 20	XXX	
	Overhead	XXX – 12	XXX - 21	XXX	XXX - 24
Abnormal gain	Material	XXX – 13	XXX – 19	XXX	
	Labour	XXX – 14	XXX – 20	XXX	
	Overhead	XXX – 15	XXX - 21	XXX	XXX - 25

Process Account

Particulars	Units	Rs.	Particulars	Units	Rs.
To Opening WIP	XXX	XXX	By Normal Loss	XXX	Scrap Value
To Direct Material		XXX	By Abnormal Loss	XXX	XXX - 24
To Direct Labour		XXX	By Process II A/c (Transfer to next process)	XXX	XXX - 22
To Overheads		XXX	By Closing WIP	XXX	XXX - 23
To abnormal gain	XXX	XXX - 25			
	XXX	**XXX**		**XXX**	**XXX**

Chapter 11 - JOINT PRODUCTS AND BY-PRODUCTS

Joint products & By-products

How to apportion total processing cost among different joint products arising out of 1 process?

Joint products means when 2 or more products of almost equal importance are produced simultaneously using same raw material in same process e.g. Oil refining industry, joint products are kerosene and petrol etc.

Method No. 1 :- Physical unit method:- Joint cost is distributed in ratio of quantity manufactured.

Method No. 2 :- Sale value at separation point method:- Joint cost is distributed in ratio of sales value at split off point.
Sale value at split off point = No. of units produced x selling price
This method is used when sale price per unit is known at split off point.

Method No. 3 :- Net realizable value (NRV) method:- Joint costs are apportioned in the ratio of net realizable values of joint products

NRV is calculated as follows:-

Sale value after further processing	XXX (No. of units manufactured x Selling price)
Less:- Further processing costs	(XXX)
NRV	XXX

This method is used when
C.1. Sale value at split off point is not known and
C.2. Product is sold after further processing.

Method No. 4 :- Average unit cost method:- under this method, first average cost per unit is calculated using following formula:-

$$\text{Average cost per unit} = \frac{\text{Total Joint Costs}}{\text{Total No.of units of jonts products}}$$

Share of each product in joint cost = No. of units of each product X Average cost per unit

Method No. 5 :- Contribution margin method
- Under this method, joint costs are divided into variable cost and fixed cost.
- Variable cost portion of joint cost is divided among products on the basis of physical units (Quantity / Units Ratio)
- Fixed cost portion of joint cost is divided among products on the basis of contribution ratio.

Contribution = Sales – Total variable cost

$$\text{Contribution Ratio} = \frac{\text{Contrinution of an individual product}}{\text{Total contribution of all products}} \times 100$$

Method No. 6 Constant gross margin % NRV method (Extension of NRV method)

Joint cost of joint products is calculated as balancing figure.

St. of joint cost apportionment

Particulars	Product A	Product B
Sale value after further processing (No. of units manufactured x Selling price)	XXX	XXX
Less further processing cost	(XXX)	(XXX)
Less Gross Margin (Sales x G. Margin Ratio)	(XXX)	(XXX)
Joint cost apportioned	**XXX**	**XXX**

Format to Calculate Overall Gross Margin %

Sale value after further processing of all joint products	XXX
Less joint cost and Further processing costs of all joint products	(XXX)
Gross Margin / Profit	**XXX**

$$\text{Gross Margin (\%)} = \frac{\text{gross margin}}{\text{total sales value}} \times 100$$

Note:-Joint cost calculated under this method may be negative sometimes since balancing figure.
Note:- Joint cost calculated among all methods need not to be same.

Decision as to go for further processing or not.

Yes process if incremental sales < incremental cost i.e. if Profit increases.

St. Showing incremental profit / loss

Particulars	Amount (Rs.)
Sales value after further processing (A)	XXX
Sales value at split off point (B)	XXX
Incremental Sales revenue (C)={(A)-(B)}	XXX
Further processing cost: (D)	XXX
Profit (Loss) arising due to further processing {(C) – (D)}	**XXX**

Decision:- Go for further processing if profit increase as a result of further processing otherwise don't go for further processing.

How to calculate joint cost of main products and by-products

When 2 or more products arise from same process using same raw material and almost of equal importance they are called joint products but when any product has less selling price in market. It is called by-products.

Step 1:- Calculate Joint cost of by-product using following formula

Particulars	Amount (Rs.)
Sales value of by products	XXX
Less:- Cost incurred after separation	(XXX)
Estimated Profit	(XXX)
Estimated Expenses	(XXX)
Joint Cost	**XXX**

Step 2:- Calculate Joint cost of main product = Total joint cost of all products -Net joint cost of all by-product.

CHAPTER 12 - OPERATING COSTING OR TRANSPORT COSTING OR SERVICE COSTING

Transport Service providers

1. Transport of Passengers
2. Transport of Goods

Various Cost per unit shall be calculated as follows:-

Service Provider	Cost per unit	Formula
Ola Cab / Taxi	Cost per Km.	$\frac{\text{Total Cost of operating}}{\text{Total Kms.run}}$
School Bus, Chartered Bus, Railways, Airlines	Cost per passenger	$\frac{\text{Total Cost of operating}}{\text{Total Passengers}}$
Metro, DTC Bus	Cost per passenger per km	$\frac{\text{Total Cost of operating}}{\text{Total Passengers-Kms}}$
Goods Transport Service providers	Cost per tonne per km	$\frac{\text{Total Cost of operating}}{\text{Total Tonne-Kms}}$

Total Passenger – Kms = Total No. of Passengers x Total Kms.

All expenses in 2 categories

All expenses in 2 categories

a. Fixed Exp. / Standing Charges :- e.g. Salary to driver, Insurance, Road Tax etc

b. Running Charges / Variable Expense:- Purely dependent on running of vehicle like petrol exp. diesel, Repairs.

Note 1:- Dep. Of vehicle
- Fixed if life is in years
- Variable if life is in kilometers
- Fixed if nothing specified

Note 2:- Repairs & Maintenance
- Fixed if in form of AMC
- Otherwise variable

In case of transport of goods services, we shall calculate cost per tonne-km.
Total Tonne-km = Total Tonne x Total Kms.

Tonne km are of 2 types:-
1. Absolute Tonne Km = Weight in tonne x km run
2. Commercial Tonne – Km = Total Km x Avg. Tonne Km.

Total Collection for transport industry is called as total takings.

Particulars	Amount (Rs.)
Total operating Cost	XXX
Add:- Profit	XXX
Net Takings	XXX
Add:- Passenger Tax	XXX
Total Takings	XXX

SERVICE Costing for Hospital

Hospital charging unit is "Rent per bed per day"

Rent per patient per day = $\frac{\text{Total operating cost+Desired profit}}{\text{Total No.of patient days}}$

Patient Days = No. of beds x No. of Days x Occupancy Rate

Break Even Points (In Number of patient Days)

BEP Points (No. of Units) = TFC / (S.p.p.u – V.Cost p.u.) = TFC / Contribution Per unit

In case of hospital (unit means patient-day)
- No. of units = No. of patient Days
- V. cost per unit = V cost per patient Day

SERVICE COSTING FOR CANTEEN COSTING

Fixed menu in Thali

Cost per meal / Thali = $\frac{\text{Total Operating cost}}{\text{No.of meals}}$

SERVICE Costing for Lodge

Same like Hotels. Charging unit is "Rent per room per day"

Cost per room per day = $\frac{\text{Total operating cost}}{\text{Total number of room days}}$

Total Room Days = No. of Rooms X Occupancy ratio x No. of Days

SERVICE Costing for Software Developing companies

Cost is calculated on project-by-project basis.
Cost of project = Cost per project = Specific Cost involved for project + Overhead cost absorbed (Normally on the basis of salaries).

SERVICE Costing for Toll Roads

Construction of Highway – 10 Year right to recover Toll from vehicles passing through

3 types of expenditure:-
- Capital cost = Huge amount incurred in beginning in construction of Road
- Operating Cost = salary of persons involved in collecting tolls
- Maintenance Cost = Cost incurred in maintain repairs every year.

Price per vehicle = Toll Rate per vehicle =

Formula 1:- Cost per vehicle + profit per vehicle

Cost per vehicle = $\frac{\text{Total of capital cost+operating cost+maintenance cost}}{\text{Total number of vehicles estimated to be passing through this highway}}$

Formula 2:- $\frac{\text{Total Cost+Total Profit}}{\text{Total Number of chargeable Vehicles}}$

Cost per Km - Constructed = $\frac{\text{Total of capital cost+operating cost+maintenance cost}}{\text{Total Length of Road (Total Km)}}$

SERVICE Costing for POWER HOUSE

Generate electricity & calculate cost per unit of electricity generated

Cost per unit of electricity generated = $\frac{\text{Total Cost}}{\text{Total chargeable Units Generated}}$

SERVICE Costing for Financial Institutions

Loan to persons for buying a house, buying a car, buying Switzerland ticket etc.

Processing Cost per home loan application = $\frac{\text{Total Processing Cost in a year}}{\text{Total number of loan applications in a year}}$

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CA. Inter & Final - costing faculty

chapter 13 - Standard Costing

Variances at a Glance

- Total Cost Variance
  - Material Cost Variance
    - Price Variance
    - UsageVariance
      - Mix Variance
      - Yield Variance
  - Labour Cost Variance
    - Rate Variance
    - Idle Time Variance
    - Efficiency Variance
      - Mix Variance
      - Yield Variance
  - Overhead Cost Variance
    - Variable Overheads Variance
      - Expenditure Variance
      - Efficiency Variance
    - Fixed Overhead Variance
      - Expenditure Variance
      - Volume Variance
        - Efficiency Variance
        - Capacity Variance
        - Calendar Variance

(I) Material Cost Variance

[Standard Cost – Actual Cost]
(The difference between the Standard Material Cost of the actual production volume and the Actual Cost of Material)
[(SQ × SP) – (AQ × AP)]

Material Price Variance
[Standard Cost of Actual Quantity – Actual Cost]
(The difference between the Standard Price and Actual Price for the Actual Quantity Purchased)
[(SP – AP) × AQ]
Or
[(SP × AQ) – (AP × AQ)]

Material Usage Variance
[Standard Cost of Standard Quantity for Actual Production – Standard Cost of Actual Quantity]
(The difference between the Standard Quantity specified for actual production and the Actual Quantity used, at Standard Price)
[(SQ – AQ) × SP]
Or
[(SQ × SP) – (AQ × SP)]

Material Mix Variance
[Standard Cost of Actual Quantity in Standard Proportion – Standard Cost of Actual Quantity]
(The difference between the Actual Quantity in standard proportion and Actual Quantity in actual proportion, at Standard Price)
[(RSQ – AQ) × SP]
Or
[(RSQ × SP) – (AQ × SP)]

Material Yield Variance
[Standard Cost of Standard Quantity for Actual Production – Standard Cost of Actual Quantity in Standard Proportion]
(The difference between the Standard Quantity specified for actual production and Actual Quantity in standard proportion, at Standard Purchase Price)
[(SQ – RSQ) × SP]
Or
[(SQ × SP) – (RSQ × SP)]

(ii) Labour Cost Variances

[Standard Cost – Actual Cost]
(The difference between the Standard Labour Cost and the Actual Labour Cost incurred for the production achieved)
[(SH × SR) – (AH* × AR)]

Labour Rate Variance
[Standard Cost of Actual Time – Actual Cost]
(The difference between the Standard Rate per hour and Actual Rate per hour for the Actual Hours paid)
[(SR – AR) × AH*] Or
[(SR × AH*) – (AR × AH*)]

Labour Idle Time Variance
[Standard Rate per Hour x Actual Idle Hours]
(The difference between the Actual Hours paid and Actual Hours worked at Standard Rate)
[(AH* – AH#) × SR] Or
[(AH* × SR) – (AH# × SR)]

Labour Efficiency Variance
[Standard Cost of Standard Time for Actual Production – Standard Cost of Actual Time]
(The difference between the Standard Hours specified for actual production and Actual Hours worked at Standard Rate)
[(SH – AH#) × SR] Or
[(SH × SR) – (AH# × SR)]

Labour Mix Variance Or Gang Variance
[Standard Cost of Actual Time Worked in Standard Proportion – Standard Cost of Actual Time Worked]
(The difference between the Actual Hours worked in standard proportion and Actual Hours worked in actual proportion, at Standard Rate)
[(RSH – AH#) × SR]
Or
[(RSH × SR) – (AH# × SR)]

Labour Yield Variance Or Sub-Efficiency Variance
[Standard Cost of Standard Time for Actual Production – Standard Cost of Actual Time Worked in Standard Proportion]
(The difference between the Standard Hours specified for actual production and Actual Hours worked in standard proportion, at Standard Rate)
(SH – RSH) × SR Or
(SH × SR) – (RSH × SR)

Variable Overhead Cost Variance

(Standard Variable Overheads for Production – Actual Variable Overheads)

Variable Overhead Expenditure (Spending) Variance
(Standard Variable Overheads for Actual Hours#)
Less
(Actual Variable Overheads)
[(SR – AR) × AH#]
Or
[(SR × AH#) – (AR × AH#)]

Variable Overhead Efficiency Variance
(Standard Variable Overheads for Production)
Less
(Standard Variable Overheads for Actual Hours#)
[(SH – AH#) × SR]
Or
[(SH × SR) – (AH# × SR)]

(iv) Fixed Overhead Variances

(Absorbed Fixed Overheads) Less (Actual Fixed Overheads)

Fixed Overhead Expenditure Variance
(Budgeted Fixed Overheads)
Less
(Actual Fixed Overheads)
Or
(BH × SR) – (AH × AR)

Fixed Overhead Volume Variance
(Absorbed Fixed Overheads)
Less
(Budgeted Fixed Overheads)
Or
(SH × SR) – (BH × SR)

Fixed Overhead Capacity Variance
SR (AH – BH)
Or
(AH × SR) – (BH × SR)

Fixed Overhead Calendar Variance
Std. Fixed Overhead rate per day (Actual no. of Working days – Budgeted Working days)

Fixed Overhead Efficiency Variance
SR (AH – SH)
Or
(AH × SR) – (SH × SR)

AH* - Actual Hours paid
AH# - Actual Hours worked

CHAPTER 14 - MARGINAL COSTING

Contribution

Formula 1:- Contribution per unit = Selling price per unit – Variable Cost per unit
Formula 2:- Total Contribution = Total Sales – Total Variable Costs
Formula 3:- Contribution = Fixed Cost + Profit (Derivation covered in class)
Formula 4:- Contribution = Fixed Cost – Loss (Derivation covered in class)

Contribution to Sales Ratio

Contribution to Sales Ratio = $\frac{\text{contribution}}{\text{sales}}$ x100 (Expressed in %)

- Called Profit-Volume Ratio (P/V Ratio)
- Fixed Cost is ignored in Decision Making

Formula 5 :- Contribution = Sales x P/V Ratio

P/V ratio = $\frac{\text{sales - variable cost}}{\text{sales}}$ x100 = $\frac{\text{fixed cost + profit}}{\text{sales}}$ x100 = $\frac{\text{fixed cost - loss}}{\text{sales}}$ x100

Break Even Point Sales

BEP Sales means "No Loss Sales" OR "Survival Sales"

BEP (In units) = $\frac{\text{Fixed Cost}}{\text{contribution per unit}}$ (Formula 1)

BEP Sales in rupees = $\frac{\text{Fixed Cost}}{\text{p/v ratio}}$ (Formula 2)

Calculating P/V Ratio when break-even sales given

P/v ratio = $\frac{\text{fixed cost + profit}}{\text{sales}}$ x100

At BEP, Profit = Zero & Sales means BEP Sales

P/V Ratio = $\frac{\text{fixed cost}}{\text{break even sales}}$ x100 (Formula)

Calculating P/V Ratio when profit and sales volume of 2 periods are given.

P/V Ratio = $\frac{\text{difference in profit}}{\text{difference in sales}}$

Margin of safety sales

- Sales generating profit
- MOS sales means excess of actual sales over break-even point sales

MOS Sales units = $\frac{\text{profit}}{\text{contribution per unit}}$

MOS Sales in Rs. = $\frac{\text{profit}}{\text{pv ratio}}$

Break Even Sales Ratio and MOS Sales Ratio

Break Even Sales ratio + MOS Sales Ratio = 100%

Variable cost to sales ratio

variable cost to sales ratio = $\frac{\text{variable cost}}{\text{sales}}$ x100

If variable cost to sales ratio is 60% then it means that if sales is made for Rs. 100 the variable cost of Rs. 60 is incurred

Relation between PV Ratio & Variable Cost to Sales Ratio

Relation between PV Ratio & Variable Cost to Sales Ratio
P/V Ratio + variable cost to sales ratio = 100%

Required sales level to earn desired profit

Desired level of Sales (In units) = $\frac{\text{fixed cost + profit}}{\text{contribution per unit}}$
(Sum of BEP Sales and MOS Sales Formula)

Desired level of Sales (In Rs.) = $\frac{\text{fixed cost + profit}}{\text{p/v ratio}}$
(Sum of BEP Sales and MOS Sales Formula)

Merger of 2 departments or companies

If management of 2 or more companies decides to merge companies which are operating at same or different capacity level then Merged company desires to know following things:-

1. P/V Ratio
2. BEP in rupees
3. Capacity utilization at BEP
4. Desired Sales
5. Desired Profit
6. Desired capacity utilization of merged plant

Step1 :- Make marginal cost equation of all companies at 100% capacity level
Step2 :- Add all figures to calculate Sales, Variable Costs, Fixed Costs and Contribution of merged company.
Note :- Fixed cost shall include additional fixed cost involved in merger, if any

P/V Ratio of merged co. = $\frac{\text{Total contribution of all co.at 100\% capacity}}{\text{Total sales of all co.at 100\% capacity}}$ x100

BEP in rupees of merged co. = $\frac{\text{Total Fixed cost of all co.+Additiona FC of merger,if any}}{\text{PV Ratio of merged co.}}$ x100

Capacity utilization at BEP of merged co. = $\frac{\text{BEP of merged co.}}{\text{Total sales of merged co.at 100\% capacity}}$ x100

Desired sales to earn given profit = $\frac{\text{Fixed cost of merged co.+desired profit}}{\text{PV Ratio of merged co.}}$ x100

Capacity utilization at desired sales = $\frac{\text{desired sales}}{\text{Total sales of merged co.at 100\% capacity}}$ x100

Cash BEP

Minimum level of sales at which company is able to recover out fixed cost incurred in cash.

Cash BEP in units= $\frac{\text{Cash Fixed cost}}{\text{contribution per unt}}$

Cash BEP in rupees = $\frac{\text{cash Fixed cost}}{\text{PV ratio}}$

Cash fixed cost = Total FC – Non-FC

Non-cash FC are those which do not involve cash outflow e.g. depreciation

Shut down Point

Decision as to whether Produce or discontinue loss making product

FC is divided in 2 category :-
Unavoidable FC :- FC which has to be incurred whether or not item is produced.
Avoidable FC :- FC which can be avoided by stopping production.

SDP Sales (units) = $\frac{\text{Avoidable Fixed Cost}}{\text{contribution per unit}}$

SDP Sales (Rs.) = $\frac{\text{Aviodable FC}}{\text{PV Ratio}}$

Avoidable FC = Total FC – Unavoidable FC

Absorption Vs Marginal costing:-

Income statement under Marginal costing approach

Particulars		Amount (Rs.)
Variable (Direct Material Cost)		XX
Variable (Direct Labour Cost)		XX
Variable (Direct Expenses)		XX
Variable Factory OH		XX
Variable manufacturing cost of Quantity Produced		**XX**
Add:- Opening FG		XX
Less:- Closing FG		(XX)
Variable manufacturing cost of Quantity Sold		**XX**
Add:- Variable Office & Admin OH		XX
Add:- Variable Selling & Distribution OH		XX
Variable Cost of Sales	(A)	**XX**
Sales	(B)	XX
Contribution (B – A)		XX
Less:- Fixed Factory OH		(XX)
Fixed Office and Admin OH		(XX)
Fixed Selling & Distribution OH		(XX)
Profit		**XX**

Income statement under Absorption costing approach

Particulars		Amount (Rs.)
Variable (Direct Material Cost)		XX
Variable (Direct Labour Cost)		XX
Variable (Direct Expenses)		XX
Variable Factory OH		XX
Fixed Factory OH absorbed units produced x standard rate per unit		XX
Total manufacturing cost of Quantity Produced		**XX**
Add:- Opening FG		XX
Less:- Closing FG		(XX)
Total manufacturing cost of Quantity Sold		**XX**
Add:- Variable Office & Admin OH		XX
Fixed Office and Admin OH		XX
Variable Selling & Distribution OH		XX
Fixed Selling & Distribution OH		XX
Add:- Under absorbed OH (Actual OH incurred – OH absorbed)		XX
Less:- Over absorbed OH (OH absorbed – Actual OH incurred)		(XX)
Total Cost of Sales	(A)	**XX**
Sales	(B)	XX
Profit	(B – A)	**XX**

Reason for difference in profit

Particulars	Amount (Rs.)
Profit under marginal costing	Xxx
Add:- Opening stock Excess in marginal costing	Xxx
Closing stock Excess in absorption costing	Xxx
Less:- Opening stock Excess in absorption Costing	(xxx)
Closing stock Excess in Marginal costing	(xxx)
Profit under absorption costing	Xxx

Chapter 15 - BUDGETARY CONTROL

Control Ratio

Activity Ratio

$$= \frac{\text{std hours for actual output obtained}}{\text{budgeted hours for budgeted production}} \times 100$$

Capacity ratio

$$= \frac{\text{actual hours worked}}{\text{budgeted hours for budgeted production}} \times 100$$

Efficiency ratio

$$= \frac{\text{std.hours for actual output obtained}}{\text{actual hours worked}} \times 100$$

Activity ratio = Capacity ratio x efficiency ratio

DIFFERENT BUDGETS

Sales Budget
- Sales target (In units & In Amount)
- Actual Sales compared with Budgeted
- Analyse Sales Variances

Production Budget
- Units to be produced
- Budgeted production = budgeted Sales + closing stock of finished goods – opening stock of finished goods

Raw Material Budget
- Raw material to be purchased = budgeted production x raw material requirement per unit

Production Cost Budget
- Cost which should have been incurred for the budgeted production level.
- Budgeted production cost is compared with actual production cost
- Analyse variance

Flexible Budget

Flexible Budget

This budget is prepared at different level of production. We divide all types of expenses into 3 categories while making this budget

a. Variable expense = Feature (variable cost remain same at per unit at all levels)
b. Fixed expenses = Feature (Fixed cost in totality remain same at all levels)
c. Semi-variable expenses = Neither Variable Exp. Nor Fixed Exp.

$$\text{Variable portion in semi-variable cost} = \frac{\text{Difference in total semi-variable cost}}{\text{Difference in units}}$$

Fixed portion in semi variable cost = Total semi variable cost – Total variable portion in semi-variable cost.

Cash budget

- Estimated cash inflows and outflows during the budgeted period.
- Cash account is maintained for past cash inflows and cash outflows.
- Opening cash balances + estimated cash receipts – estimated cash payments = closing cash balance

Zero base budgeting (ZBB)

- Make budget Future based (Not Past Based)