Questions that needs to be done first 12, 15, 17, 13, 26, 28

Material Costing

Material
- Direct Material
- Indirect Material

Direct Material	Indirect Material
- Direct- It can be convinitly identified in a finished product.	- It cannot be conviniently identified in a finished produc
- It is a part of variable cost.	- It may or may not be variable cost.
- It is a part of prime cost.	- It is a part of overhead.

- Variable cost

The cost which changes porportionately with change in level of output i.e per unit cost remains costant.

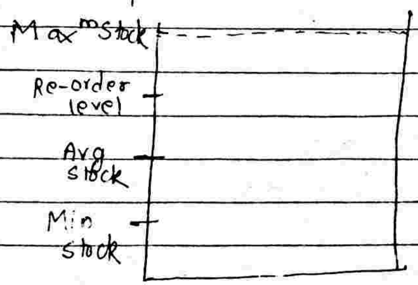
32 → 128 (4, 3.75)
48 = 180

- Fixed cost

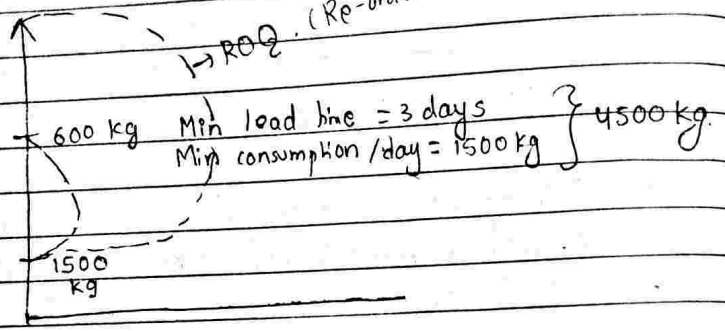
The cost which remains constant with level of output i.e total cost remains constant.

Variable cost

Determination of stock level



(1) Maximum stock level - Highest Possible stock level



Max Stock level = Re-order level - (Min consumption × Min-lead time) + Re-ordered Qty.

Re-order level (ROL)

It is that stock level at which the order for quantity is made.

Traditional approach :-

To minimize maximum adverse scenario of stock out.

ROL = Maximum consumption × Maximimum lead time

Moderate approach :-

ROL = Average consumption × Avg. Lead time + Safety Stock

Re-order level

Minimum stock level

It is that stock level which is to be maintained throughout the period.

Min. stock level = ROL - (Average consumption × Avg. lead time)

Note

Min Stock level = ROL - (Avg Con × Avg lead time)
= (Avg Cons. × Avg. lead time) + Safety stock - (Avg Con × Avg lead time)

∴ Min Stock level = Safety stock.

(4) Average stock level

$$= \frac{\text{Max stock} + \text{Min stock}}{2}$$

$$= \text{Min. stock level} + \frac{1}{2} ROQ.$$

Note

$$\text{Avg. stock} = \frac{\text{Max}^m \text{ stock} + \text{Min. stock}}{2}$$

$$= \frac{ROL - (\text{Min Con} \times \text{Min lead time}) + ROQ + \text{Min. stock}}{2}$$

$$= \frac{ROL - (\text{Avg Con} \times \text{Avg lead time}) + (\text{Avg Con.} \times \text{Avg lead time}) - (\text{Min Con} \times \text{Min lead time}) + ROQ + \text{Min Stock}}{2}$$

$$= \frac{\text{Min stock} + (\text{Avg Con} \times \text{Avg lead time}) - (\text{Min Con} \times \text{Min lead time}) + ROQ + \text{Min stock}}{2}$$

$$= \text{Min. stock} + \frac{1}{2} ROQ + \frac{1}{2}[(\text{Avg Con} \times \text{Avg lead time}) - (\text{Min Con} \times \text{Min lead time})]$$

(v) Danger Level
which requires immediate action.
DL = Average consumption × Emergency lead time

Factors to be considered for determining stock level.

(i) Availability of storage capacity.
(ii) Availability of finance to invest in working capital i.e (stock)
(iii) Reorder level
(iv) Rate of consumption and delivery time.

Economic order quantity (EOQ)
Order size, at which total inventory cost is minimum

Inventory cost.

⇒ Total carrying cost + Total ordering cost + Total purchase cost.

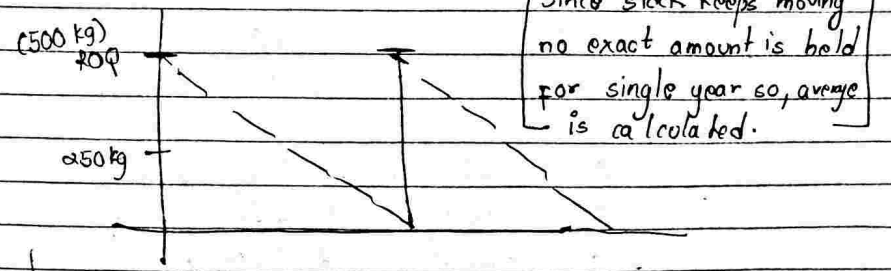
Ordering cost :- It is the cost incurred on ordering an order size from the point of supplier upto the factory premises. It includes loading charge, transportation cost, comm^n cost, insurance in transit, custom duty / clearing charges, oth^r (unloading charges e.t.c).
Example:-
Annual requirement of material (A) = 40,000 kg
Reorder quantity (ROQ) = 10,000 kg
Ordering cost (O) = 10,000

Now,
No. of order = $\frac{A}{ROQ} = \frac{40,000}{10,000}$ = 4 order
Total ordering cost = No of order × Ordering cost
= 4 × 1000
= Rs 4,000.

Conclusion :-
Total ordering cost = No of order × ordering cost
$= \frac{A}{ROQ} \times O$ or

(b) Total carrying cost
It is the cost incurred on holding in average inventory held for a year. It includes, godown rent, insurance, storekeeper salary (interest.)
hold garna ko lagi paisa lagcha ra tyo pani tesle katai bata lora aayeko huncha ani tesko interest

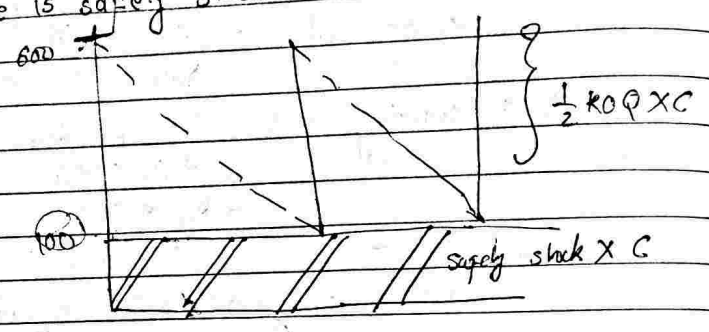
Total carrying cost = Average inventory held in a year × carrying cost / unit per year
$= \frac{1}{2} ROQ \times C.$



[Since stock keeps moving no exact amount is held for single year so, average is calculated.]

Average stock held in a year = $\frac{\text{Maximum} + \text{Min stock}}{2} = \frac{1}{2} ROQ$

If there is safety stock.



(c) Total purchase cost :-

⇒ Annual requirement of raw materials × Purchase price per unit.

⇒ A × P

(cont^n) At EOQ, total carrying cost = total ordering cost

At EOQ,

No of lorddr = $\frac{A}{ROQ} = \frac{49000}{10,000}$

Total ordering cost = Total carrying cost.

or, $\frac{A}{EOQ} \times O = \frac{1}{2} \times EOQ \times C$

or, $EOQ^2 = \frac{2AO}{C}$

$\therefore EOQ = \sqrt{\frac{2AO}{C}}$

[hit & trial]

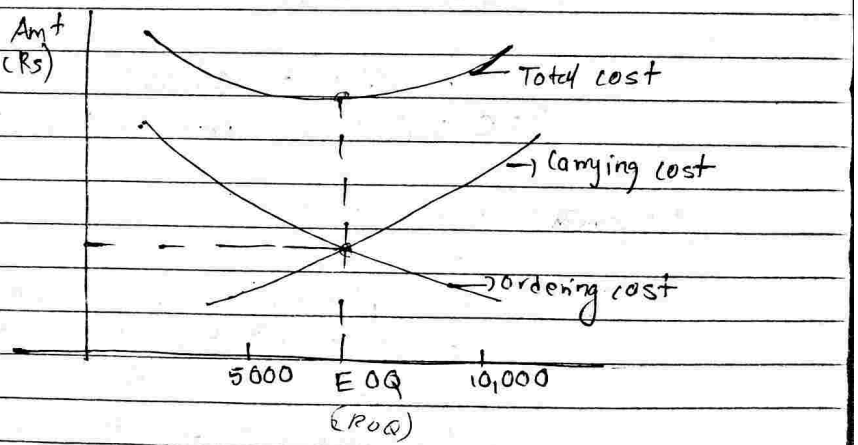
Here,

A = annual requirement of material

O = ordering cost / order

C = carrying cost / unit p.a.

	I	II	
ROQ	5,000 kg	10,000 kg	↑ Datrai vane ↓ Be
A	40,000 kg	40,000 kg	
O	Rs 1000	Rs 1000	Order ↓
C	Rs 10	Rs 10	Carrying cost ↑
P	Rs 10	Rs 10	Carrying cost remain garne
Total carrying cost ($\frac{1}{2}$ × ROQ × C)	= 25,000	50,000 ↑	
Total ordering cost ($\frac{A}{ROQ} \times O$)	= 8,000	4,000 ↓	
Purchase cost (A × P)	= 4,00,000	4,00,000	
Inventory cost	= 4,33,000	4,54,000	



Note:- Carrying cost and ordering cost have inverse relationship.

Relevent cost :- The cost which impacts the decision making of a user are relevant cost.

Total Relevant cost = Total carrying cost + total ordering cost if discount facility is provided.

Total relevant cost = total carrying cost + total ordering cost + total purchase cost

or

= Total carrying cost + total ordering cost − Discount

[Cost −ve money to income]

Plan I − TRC = 25,000 + 8,000 − 0 = 33,000

Plan II

TRC = 50,000 + 4,000 − 40,000 = 14,000 (better option)

If discount, 60,000

TRC = (6,000) (more better income)

Relevent cost of EOQ

Relevent cost = Total carrying cost + Total Ordering cost

$$= \frac{1}{2} \times EOQ \times C + \frac{A}{EOQ} \times O$$

$$= \frac{1}{2} \times \sqrt{\frac{2AO}{C}} \times C + \frac{A}{\sqrt{\frac{2AO}{C}}} \times O$$

$$= \frac{1}{2}\sqrt{2AOC} + \frac{A}{\sqrt{\frac{2AO}{C}}} \times \frac{\sqrt{\frac{2AO}{C}}}{\sqrt{\frac{2AO}{C}}} \times O$$

$$= \frac{1}{2} \times \sqrt{2AOC} + \frac{A}{\frac{2AO}{C}} \times \sqrt{\frac{2AO}{C}} \times O$$

$$= \frac{1}{2} \times \sqrt{2AOC} + \frac{1}{2} \times \sqrt{\frac{2AO}{C}} \times C$$

$$= \frac{1}{2} \times \sqrt{2AOC} + \frac{1}{2} \times \sqrt{2AOC}$$

$$= \sqrt{2AOC}$$

2.32

Problem no 3

EOQ =

Note

(i) Annual Requirement of Material ⇒ A

(ii) Annual Requirement of material and annual Requirement of Product

⇒ A ⇒ Annual Requirement of material.

(iii) Annual requirement of Product

⇒ A = Annual Requirement of Product.

[Assumption :- 1 unit of product requires one unit of material]]

Q no 3 2.32

$$EOQ = \sqrt{\frac{2AO}{C}}$$

when,

A = Annual Requirement of Material

= Avg consumption × No of week p.a

= 275 × 52

= 14300 kg

O = Ordering cost/order = 2100

C = Carrying cost /unit p.a.
= Purchase cost (P) X % p.a
= 10 X 20%
= Rs. 2

$\therefore EOQ = \sqrt{\frac{2 \times 14300 \times 100}{2}}$

= 1195.8
= 1196 kg

(iii) Re-order level = Max cons X Max lead time
= 450 X 8
= 3600 kg

(vi) Max. stock level = ROL - (Min cons / Min lead time) + ROQ
= 3600 - (100 X 4) + 1196
= 4396 kg

(iv) Min Stock level = ROL - (Avg. Con X Avg lead time)
= 3600 - (275 X (8+4)/2)
= 1950 kg

(v) Avg stock level = (Max Stock + Min Stock) / 2
= (4396 + 1950) / 2
= 3173 kg.

$C = P \times \%$ | cost carrying

	ROQ
A	5000
B	2100

Qno 4 ⟶ Add ⟶

Qno 5

~~which requires~~ → if not (my product)
which requires → ZED (raw material)

Qno 5 $EOQ = \sqrt{\frac{2AO}{C}}$

where,
A = Annual Requirement of ZED
= 7500 X 12
= 90,000 units.
O = Ordering cost /order = 2500.
C = Carrying cost unit per annum.
= Purchase cost (P) X % p.a
= 60 X 10%
= 6

(i) $\therefore EOQ = \sqrt{\frac{2 \times 90,000 \times 500}{6}}$

= 3872.98
= 3875 units.

(iv) Re-order level = Max consumption X Max lead time
= 750 X 8
= 6000 units

(vi) Max stock level = ROL - (Min con / Min lead time) + ROQ
= 6000 - (250 X 5) + 3873
= 8623 units

(iv) Min Stock level = ROL - (Avg con X Avg lead time)
= 6000 - (500 X (8+9)/2)
= 4750 units.

(v) Avg stock level = $\frac{\text{Max Stock} + \text{Min Stock}}{2}$

$= \frac{8623 + 2750}{2}$

$= 5686.5$ units.

Q no 8

$EOQ = \sqrt{\frac{2AO}{C}}$

where,

A = Annual Requirement of
= 100 x 52
= 5200 tubes.

O = Ordering cost / order = Rs 100.

C = Carrying cost / unit p.a
= Purchase cost (P) x % p.a
= 500 x 20%
= Rs 100.

$\therefore EOQ = \sqrt{\frac{2 \times 5200 \times 100}{100}}$

$= 101.98$

≈ 102 tubes.

(iii) Relevant cost at ROQ $= \sqrt{2AOC}$

$= \sqrt{2 \times 5200 \times 100 \times 100}$

$= Rs\ 10198.03$

$\approx Rs\ 10198.$

where,
New carrying cost / unit pa (C) = C - % discount
= 100 - 5% of 100
= Rs 95

or
P x %
= (500 x 95%) x 20%
= Rs 95.

Relevant cost of ROQ of 1500 unit

= Total carrying cost + Total ordering cost - discount

$= \frac{1}{2} \times ROQ \times C_1 + \frac{A}{ROQ} \times O - (A \times P \times \text{discount \%})$

$= \frac{1}{2} \times 1500 \times 95 + \frac{5200}{1500} \times 100 - (5200 \times 500 \times 5\%)$

$= 71250 + 346.67 - 1,30,000$

$= (Rs\ 58403.33)$.

Decision :- The offer of supplier to supply quantity 1500 units @ 5% discount should be accepted as it results in saving of 68601.33.

Re-order level :- Max cons x Max lead time.
= 200 x 8
= 1600 tubes.

Max Stock level = ROL - (Min cons x Min lead time) + ROQ
= 1600 - (50 x 6) + 1500
= 2800 tube.

Min stock level = ROL - (Avg consumption x Avg time)
= 1600 - $\left(100 \times \left(\frac{8+6}{2}\right)\right)$
= 900 tube.

Q no 9 Soln:-

(i) For the minimum level of stock A =

= ROL − (Avg consumption × Avg lead time)

= 8,000 − (200 × 10 × 2)

~~Re-order level = Max consumption × Max lead time~~

= 4,000 ~~10~~ kgs. ~~× 3~~

(ii) Maximum stock of B =

= ROL − (Min cons. × Min lead time) + ROQ

= 4,750 − (275 × 4 × 3) + 2100

= 4,750 − 2700 + 2100

= ~~7650~~ 4,750 #

(iii) Re-order level at C = Max cons. × Max lead time

= 225 × 6 × 4

= 5400

(iv) Average stock level at A =

$$\frac{\text{Min stock} + \text{Max Stock}}{2}$$

Min stock = 4,000

Max stock = ROL − (Min cons × Min lead time) + ROQ

= 8,000 − (175 × 10) + 5000

= 11250 #

Now $\frac{\text{Min stock} + \text{Max stock}}{2}$

= $\frac{4000 + 11250}{2}$ = 7625 kgs #

Q no 12

Economic Batch Qty (EBQ) = $\sqrt{\frac{2AS}{C}}$

where

A = Annual Requirement of bearing = 24000

S = Set up cost / run = Rs 324

C = Carrying cost / Bearing p.a

= 0.10 × 12

= 1.2

EOQ = $\sqrt{\frac{2 \times 24000 \times 324}{.12}}$

= 3600 bearing.

(b) Relevant cost at EOQ = $\sqrt{2AOC}$

= $\sqrt{2 \times 24000 \times 324 \times 1.2}$

= Rs 4320

Relevant cost of 6000 bearing / run.

= Total carrying cost + Total ~~ordering~~ set-up cost.

= $\frac{1}{2} \times 6000 \times 1.2 + \frac{24000}{6000} \times 324$

= 3600 + 1296

= Rs 4896.

∴ Extra cost to be incurred by (6) = 4896 − 4320

= Rs 576.

(c) Minimum holding / carrying cost = $\frac{1}{2} \times$ EOQ × C

= $\frac{1}{2} \times 3600 \times 1.2$

= Rs 2160.

Frequency / Inventory cycle → Material ...
Replace ...

Note
OIS of bearing = 4000 unit
CIS of bearing = 6000 unit
Steady Supply of bearing = 22000 units.
OIS + Prodn = CIS + Sales
4000 + Prodn = 6000 + 22,000
∴ Prodn = 24000 unit.

Qno15

$$EOQ = \sqrt{\frac{2AO}{C}}$$

where,
A = Annual Requirement of Material
= 100,000 / 2.5
= 40,000 kg.
O = Ordering cost / order = Rs 390 + 360 = Rs 750
C = Carrying cost / unit p.a
= 0.5 × 12 + 9
= 8.75 − 15
∴ $EOQ = \sqrt{\frac{2 \times 40,000 \times 750}{15}}$
= 2000 kg.

(ii) Frequency / inventory cycle = No of days p.a / No of order
= 365 / 20
= 18.25 days.

where No of order = A / ROQ = 40,000 / 2,000 = 20 order

No of order = A / ROQ
ROQ = A / No of order = 40000 / 4 = 10,000 quarterly
(iii) For Relevant Decision: 40,000 → 4 quarterly

Relevant cost on Quarkly Purchase = Relevant cost at EOQ
or, Total Carrying cost + Total ordering cost − discount = $\sqrt{2AOC}$
or, $\frac{1}{2} \times 10,000 \times 15 + \frac{40,000}{10,000} \times 750 - \text{discount} = \sqrt{2 \times 40,000 \times 750 \times 15}$
or, 75000 + 3000 − discount = 30,000
∴ Discount = Rs 48,000

where,
ROQ on Quarkly Purchase = 40,000 / 4 = 10,000 kg
We know, A × P × Discount (%) = 48,000
% Discount = Discount / Purchase cost × 100 %
= 48000 / (40,000 × 60) × 100 %
= 2 %.

Note
Inventory cycle of 6 days indicates that one order fulfills the requirement for 6 days or one order replace the other order after every six days.

Q no 17

$$EOQ = \sqrt{\frac{2AO}{C}}$$

A = Annual requirement of Casting = 54000
O = Ordering cost order = Rs 9000
C = Carrying cost / Casting p.a = Rs 300
∴ $EOQ = \sqrt{\frac{2 \times 54,000 \times 9000}{300}}$ = 1800 casting

Delivery 6 din में हुई तो safety stock 2120 से घटेगा।

Calculation of Safety Stock Days

Days	% occurance	Cum/Occurance	% Risk	Safety stock
6	75%	75	25%	—
7	10%	85	15%	1
8	5%	90	10%	2
9	5%	95	5%	3
10	5%	100	—	4

(i) If 15% risk of stock out is assumed, Then safety stock for 1 additional day is required,

∴ Safety Stock = Avg Con / day × Safety stock days

$= \left(\frac{52,000}{360}\right) \times 1.$

= 150 casting.

∴ Re order level = (Avg cons × Avg lead time) + Safety Stock

= (150 × 6) + 150

= 1050 casting

(iii) If 5% risk of stock cost is assumed, Then safety stock for 3 days is required.

∴ Safety stock = 150 × 3 = 450 casting

∴ Re-order level = (150 × 6) + 450

= 1350 casting.

(iv) At 5% risk of stock out

Total ordering cost = $\frac{A}{EOQ} \times O$

$= \frac{52,000}{1800} \times 9000$

= Rs 270,000

Total carrying cost = $\frac{1}{2} \times EOQ \times C$ + Safety stock × C

$= \frac{1}{2} \times 1800 \times 300 + 450 \times 300$

= Rs 405000

(ii) New $EOQ = \sqrt{\frac{2AO_1}{C_1}}$

where,

O_1 = Revised ordering cost / order = Rs 600

C_1 = Revised carrying cost / casting p.a. = Rs 720.

∴ New $EOQ = \sqrt{\frac{2 \times 52000 \times 600}{720}} = 300$ casting.

(b) Frequency = $\frac{\text{No of days}}{\text{No of order.}}$

New Policy $\frac{360}{180} = 2$ days

Old Policy $= \frac{360}{30} = 12$ days.

where,

No of order = $\frac{A}{EOQ}$

New Policy $= \frac{54000}{300} = 180$ order

Old policy $= \frac{54000}{1800} = 30$ order.

The company would be placing an order after every 2 days under new policy as comparision to 12 days under old policy.

Q no 13

Statement showing inventory cost

ROQ	Purchase Price (P)	Carrying cost/unit p.a CC = P × 20%)	Total Carrying cost (a = 1/2 × ROQ × c)	Total ordering cost (b = 5000/ROQ × 1200)	Purchase cost (d = 5000 × P)	Total cost (a+b+d)
400	1400	280	56000	15000	70,00,000	7071000
500	1380	276	69000	12000	69,00,000	6981000
1000	1360	272	136000	6000	6800,000	69,42000
2000	1340	268	268000	3000	67,00,000	6971000
3000	1320	264	396000	2000	66,00,000	6998000

Decision :- Since total inventory cost is minimum at an order size of 1000 tone hence the most economic purchase level is 1000 tone.

Note :-

(i) If the question doesnot provide ROQ then ROQ can be taken as any quantity from the given range. However for cosistency it is better to take lower order size from each range.

For example :-

Tonnes	ROQ
Less than 500	(300) any preferable
500 – 1000	500
1000 – 2000	1000
2000 – 3000	2000
3000 and above	3000.

(ii) If the question provides number of order instead of ROQ then ROQ is computed as

$ROQ = \frac{A}{\text{no of order}}$

For example. 1, 2, 3, 4.

No of order = $\frac{A}{ROQ}$

$ROQ = \frac{A}{n} = \frac{5000}{1} = \frac{5000}{2500}$.

Q no 26

Relevant cost at EOQ = $\sqrt{2AOC}$

where,

O = Ordering cost / order = 100

C = Carrying cost / unit

= P × % p.a

= 200 × 10 %.

= Rs 20

$C \times O = 4000$

∴ Relevant cost at EOQ = $\sqrt{2 \times A \times 100 \times 20}$

or, 4000 = $\sqrt{4000A}$

Squaring both sides,

$4000^2 = 4000A$.

∴ A = 4000.

$EOQ = \sqrt{\frac{2AO}{C}}$

$= \sqrt{\frac{2 \times 4000 \times 100}{20}}$

= 200 unit

(ii) Relevant cost at ROQ of 2000 unit

= TCC + TOC − Discount 2000

$= \frac{1}{2} \times 2000 \times 20 + \frac{4000}{2000} \times 100 - (4000 \times 200) \times 2\%$

= 20,000 + 200 − 16000

= Rs 4200

Decision :- The discount offer of 2% should not be accepted as it results in loss of Rs 200 (4200 - 4000)

(iii) At 5% discount on single order

Total Relevant cost = TCC + TOC - Discount

$= \frac{1}{2} \times 4000 \times 20 + \frac{4000}{4000} \times 100 - (40000 \times 5\%)$

$= 4000 + 100 - 40,000$

$= -(100)$

Decision :- The discount offer of 5% should be accepted as it results into benifit of 3900 (4000 - 100)

Qno28

(i) (a) $EOQ = \sqrt{\frac{2AO}{C}}$

where,

A = Annual Requirement of Material = 4000 units

O = Ordering cost /order = Rs 135

C = Carrying cost /unit p.a = 812.

$\therefore EOQ = \sqrt{\frac{2 \times 4000 \times 135}{12}} = 300$ units

Relevant cost at EOQ $= \sqrt{2AOC}$

$= \sqrt{2 \times 4000 \times 135 \times 12}$

= Rs 3600.

(ii) If ordering cost is Rs 80. EOQ =

Then,

Relevant cost at EOQ $= \sqrt{2 \times 4000 \times 80 \times 12}$

= Rs 2771

At ROQ of 300 units

Total relevant cost = Total carrying cost + Total ordering cost

$= \frac{1}{2} \times \frac{300}{} \times 12 + \frac{4000}{300} \times 80$

= Rs 2867

$\therefore$ Cost of Prediction error = 2867 - 2771

= Rs 96.

(iii) At ROQ of 4000 units.

(35) =90

Relevant cost = TCC + TOC − Discount

$= \frac{1}{2} \times 4000 \times 12 + \frac{4000}{4000} \times 135 - (4000 \times 4)$

$= 24000 + 135 - 16000$

= Rs 8135.

Decision:- The offer of discount on purchase of 4000 units should not be accepted as it results into the loss of 4535 (8135 − 3600)

Qno16 $EOQ = \sqrt{\frac{2AO}{C}}$

A = Annual requirement of material = 80,000 × 0.5 = 40,000 (80,000 × 50% since quarterly; Annual production × Units)

O = Order cost / order = 100

C = Carrying cost / unit p.a = 2

Now, $\sqrt{\frac{2 \times 40,000 \times 100}{2}}$

= 2000 units.

Now,

Re-order level = Avg consumption × Avg lead time + Safety stock

$= \frac{40,000}{360} \times 36 + 1000$

= 5000 kgs.

No of order = $\frac{A}{ROQ} = \frac{40000}{1}, \frac{40,000}{2}, \frac{40,000}{4}, \frac{40,000}{6}$..

(ii) Statement showing the total cost of procurement and storage of raw material. (After considering the discount).

Carrying cost = Holding cost = $\frac{ROQ}{2} \times C$ + Safety stock × C.

Total ordering cost = $\frac{A}{ROQ} \times O$

Total carrying cost = $\frac{1}{2} \times ROQ \times C$ + Safety stock × C

Order size (1)	No of orders (2)	Total cost (3) = $\frac{A}{ROQ} \times O$	Average stock (4) = $\frac{1}{2} \times ROQ$	Total cost of storage of raw material ((carrying) cost) (5)	Discount (6)	Total cost (7) = 3+5−6
40,000	1	100	20,000	40,000	4000	36,100
20,000	2	200	10,000	20,000	3200	17,000
10,000	4	400	5,000	10,000	200	8,400
6666.66	6	600	3333	6666	400	6866

→ Total ordering cost and carrying cost:-

No of order = $\frac{40,000}{2,000} = \frac{A}{ROQ} = 20$.

Ordering cost = 20 × 100 = 2,000

Carrying cost = $\frac{1}{2} \times 2,000 \times 2 = 2,000$

+ Safety stock × C = 2000 × 2 = 2000

1000

(ii) Number of orders which the company should place to minimize the cost after taking EOQ also into consideration is 20 order each size of 2,000 kgs. The total cost of ordering cost and carrying cost comes 6,000 which is minimum in this case.

Sijuna Dahal

Qno 31

$$EOQ = \sqrt{\frac{2AO}{C}}$$

where,
A = Annual requirement of bow = 40,000 pack
O = Ordering cost / order = 8
C = Carrying cost / pack p.a
= 40 × 10%
= Rs 4

$$\therefore EOQ = \sqrt{\frac{2 \times 40,000 \times 8}{4}}$$

= 400 pack.

(ii) No of order = $\frac{A}{EOQ} = \frac{40,000}{400} = 100$ order.

(a) Relevant cost = $\sqrt{2AOC}$
= $\sqrt{2 \times 40,000 \times 8 \times 4}$
= Rs 1600

(iii) Frequency = $\frac{\text{No of day p.a}}{\text{No of order}}$
= $\frac{360}{100}$
= 3.6 days.

One order fulfills requirement for 3.6 days
400 pack " " " 3.6 days
333 pack " " " 3 days ($\frac{36}{400} \times 333$)

∴ No of days left for order = No of days fulfilled by stock − lead time
= 3 − 3
= 0

∴ The order should be placed immediately.

Qno 49

$$\text{Avg lead time} = \frac{\text{Max}^m \text{ lead time} + \text{Min lead time}}{2}$$

$$6 = \frac{(\text{Min lead time} + 4) + \text{Min lead time}}{2}$$

∴ Min lead time = 8
∴ Min lead time = 4 days
∴ Max^n lead time = 4 + 4 = 8 days.

(i) ROL = Max consumption × Max lead time
160,000 = Max. consumption × 8
∴ Max. consumption = 20000 unit.

(iv) Max^m Stock = ROL − (Min cons × Min lead time) + ROQ
490,000 = 160,000 − (Min. cos. × 4) + 90,000
Min cons = $\frac{600,000}{4}$ = 15,000 unit.

Inventory System....

Inventory System

Perpetual Inventory System	Periodic
→ Here continuous recording of in and out of stock is made in store ledger.	Here physical count of stock is made after certain time interval to determine closing stock.
→ Here the balancing figure is closing stock.	Here the balancing figure is cost of goods sold
→ The abnormal loss is included in balancing figure i.e closing stock.	→ The abnormal loss is included in balancing figure i.e cost of goods sold.

Methods of valuation of stock

① FIFO (First in first out)
Here the item which are purchased earlier are issued first i.e stock comprises of units which are purchased currently.

Advantage
→ In inflationary situation the value of closing stock will be high resulting to higher profit.
→ In deflationary situation the value of closing stock will be low resulting to lower tax to be paid.
→ Closing stock represents current market price.

Disadvantage
→ In inflationary situation the value of closing stocks will be high resulting to higher tax to be paid.
→ In deflationary situation the value of closing stock will be low resulting to lower profit.
→ Cost of good sold doesn't represent current market price.

② LIFO (Last-in-first-out).
Here, the item which are purchased currently are issued first i.e stock comprises of units which are purchased earlier.

Advantage
→ In inflationary situation the value of closing stock will be low resulting to lower tax to be paid.
→ In deflationary situation the value of closing stock will be high resulting to higher profit.
→ Cost of good sold represent current market price.

Disadvantage
→ In inflationary situation the value of closing stock will be low resulting to lower profit. In deflationary situation the value of closing stock will be high resulting to higher tax to be paid.
→ Closing stock doesn't represent current market price.
→ This method is prohibited for use by income tax authority.
→ This method doesn't flow with physical flow of goods.

Simple average method

→ Here the issue rate is computed by taking simple average of rates of units lying in stock. This method follow fifo method for physical flow of goods.

→ This method is highly illogical method.

Op stock - 100 units @ Rs 20
Purchase 1000 @ Rs 16
Issued unit 1050
Find Closing Stock. Method: Simple Avg.

Sol:-

Closing stock unit = O/S + Purchase - Issued
= 100 + 1000 - 1050
= 50 unit.

Issued Rate = $\frac{20+16}{2}$ = Rs. 18

∴ Issued Amount = 1050 × 18
= Rs 18900.

Closing Stock value = O/S + Purchase - Issued Amount
= 100×20 + 1000×16 - 18900
= 1900.

Weighted average method

→ Here the issued rate is computed by dividing cost of goods lying in stock by units in stock.

→ This rate remains unchanged until new purchase is made or return from department is made.

Special Point

Steps to be considered:-

1. The return to supplier is made at the price at which at the price it was originally purchased.
2. The return from department is made at the price at which it was issued.

Sub case

(a) The return goods are shown on issued side and are issued immediately upon next issue irrespective of method in use.

(b) The return goods are shown on receipt side and are issued as per method in use as if it is newly purchased.

3. The abnormal loss is shown on issued side with issued rate as per method in use.
4. The normal loss is shown on issued side with nill value.

Normal loss

(1) It is an expected unavoidable loss due to inherent nature of product, process etc.

(2) The cost of normal loss is to be born by good units by inflating rate.

Abnormal loss

(1) It is the unexpected avoidable loss due to abnormal reason. i.e loss over and above the normal loss.

(2) The cost of abnormal loss is charged to costing P/L Account.

Cost per unit = $\frac{\text{Total cost} - \text{Scrap Value of Normal loss}}{\text{Total unit} - \text{Normal loss unit.}}$

Note:-

The cost per unit computed as above is used for valuation of closing stock, abnormal loss, abnormal gain e.t.c.

Inventory turnover ratio

Inventory turnover ratio It is the number of times the finished goods is converted into sales. It is the ratio of cost of goods sold and average inventory held.

$$\text{Inventory turnover ratio} = \frac{\text{Cost of goods sold}}{\text{Average inventory of finished goods}}$$

where, Cost of goods sold = Opening stock + Purchase + Direct expense − Closing stock.

$$\text{Average inventory} = \frac{\text{Opening stock} + \text{Closing stock}}{2}$$

The high inventory turnover ratio indicates that the product is fast moving in nature (highly demanded) and low inventory turnover ratio indicates that the product is slow moving in nature (less demanded).

Note:-

Inventory turnover ratio for raw material

$$= \frac{\text{Raw material consumed}}{\text{Average inventory of raw material}}$$

Inventory holding period / Stock velocity $= \frac{\text{No of days per annum}}{\text{Inventory turnover ratio}}$

Example:-

Particular	A	B.
(a) Sales	20 lakhs	100 lakhs
(b) Avg. Inventory	2 lakhs	20 lakh
(c) Inventory turnover ratio $(\frac{a}{b})$	10 times	5 times
(d) Inventory holding Period $(\frac{365}{c})$	36.5 days	73 days.

Product A is fast moving in comparision to Product B.

Q no

Store ledger

Date	Particulars	Receipt			Issued			Balance		
		Qty	Rate	Amt	Qty	Rate	Amt	Qty	Rate	Amt
								500	25	12500
1st Jan	Opening stock									
2nd "	Issued	—	—	—	400	25	2500	400	25	10,000
3rd "	"				70	25	1750	330	25	8250
8th "	"				80	25	2000	250	25	6250
13th	Received.	200	24.5	4900	—	—	—	250	25	6250
								200	24.5	4900
14th	Returned to Stock	15	24	360	—	—	—	250	25	6250
~~15~~	~~shortage.~~							200	24.5	4900
								15	24	360
15th "	Shortage	—	—	—	5	25	125	245	25	6125
								200	24.5	4900
								15	24	360.

Date	Particulars	Receipt			Issued			Balance		
		Qty	Rate	Amt	Qty	Rate	Amt	Qty	Rate	Amt
16th	Issued	-	-	-	180	25	4500	65	25	1625
								200	24.5	4900
								15	24	360
20th	Recee'v	240	24.75	5940	-	-	-	65	25	1625
								200	24.5	4900
								15	24	360
								240	24.75	5940
24th	Issued	-	-	-	65	25	1625	216	24.75	5346
					200	24.5	4900			
					15	24	360			
					24	24.75	594			
25th	Received	320	24.5	7840	-	-	-	216	24.75	5346
								320	24.5	7840
26th	Issued	-	-	-	112	24.75	2772	104	24.75	2574
								320	24.5	7840
27th	Returned to Stock	12	25	300	-	-	-	104	24.75	2574
								320	24.5	7840
								12	25	300
	Shortage	-	-	-	8	24.75	198	96	24.75	2376
								320	24.5	7840
								12	25	300
28.	Received	100	25	2500	-	-	-	96	24.75	2376
								320	24.5	7840
								12	25	300
								100	25	2500
								528		13016

Base stock Method

Here, management segregates certain quantity as base stock (safety stock) from the inital purchase and the issue is made from the balance unit. The base stock is used only on emergency sihation and is to be replaced immediately upon next purchased. This method is silent regarding issue and hence is to be associated with other method regarding issue. Hence this method is not an independent method.

Q no.15 Store ledger (Base stock with Fifo).

Date	Particular	Receipt			Issue			Balance		
		Q	R	A	Q	R	A	Q	R	A
1st Jan	Received	500	20	10,000	-	-	-	100	20	2000
								400	20	8000
10th Jan	Received	300	24	7200	-	-	-	100	20	2000
								400	20	8000
								300	24	7200
15th Jan	Issued	-	-	-	400	20	8000	100	20	2000
					300	24	7200			
20 Jan	Received	400	28	11200	-	-	-	100	20	2000
								400	28	11200
25 Jan	Issued	-	-	-	300	28	8400	100	20	2000
								100	28	2800
27 Jan	Received	500	22	11000	-	-	-	100	20	2000
								100	28	2800
								500	22	11000
31 Jan	Issued	-	-	-	100	28	2800	100	20	2000
					100	22	2200	400	22	8800
								500		10800

Take out the issue rate.

Date / /

Q no 14 Simple Average Method.

Date	Particulars	Received			Issued			Balance	
		Q	A	R	Q	A	R	Q	A
1st	Received	500	20	10,000	–	–	–	500	10,000
10th	Received	300	24	7200	–	–	–	800	17,200
15th	Issued	–	–	–	700	22	15400	100	1800
20th	Received	400	28	11200	–	–	–	500	13,000
25th	Issued	–	–	–	300	26	7800	200	5200
27th	Received	500	22	11,000	–	–	–	700	16200
31st	Issue	–	–	–	200	25	5000	500	11,200

$R_1 = \frac{20+24}{2} = 22$

$R_2 = \frac{24+28}{2} = 26$

$R_3 = \frac{26+22}{2} = 25.$

Q no 15 Weighted Average method has been employed.

Date	Particulars	Receipt			Issued			Balance		
		Q	R	A	Q	R	A	Q	R	A
July 1	Balance b/d	–	–	–	–	–	–	1600	2	3200
9th July	Purchase	3000	2.2	6600	–	–	–	4600	2.13	9800
13th July	Issue	–	–	–	1200	2.13	2556	3400	2.13	7244
9th Aug	11	–	–	–	900	2.13	1917	2500	2.13	5327
17th Aug	Purchase	3600	2.4	8640	–	–	–	6100	2.29	13967
24th Aug	Issued	–	–	–	1800	2.29	4122	4300	2.29	9845
11st Sep	Purchased	2500	2.5	6250	–	–	–	6800	2.367	16095

Date / /

Date	Particulars	Receipt			Issued			Balance		
		Q	R	A	Q	R	A	Q	R	A
27 Sep	Issue	–	–	–	2100	2.367	4971	4700	2.367	11124
29th Sep	11	–	–	–	700	2.367	1656	400	2.367	9468
30th Sep	Shortage	–	–	–	200	2.367	473	3800	2.367	8995

Q no 16

(i) Cls unit = Op. stock + Purchase − Sales
= 3000 + 26,000 − 25,000
= 4000 unit.

Cl. Stock Value = 3000 × 3 + 1000 × 5 = Rs 14000
(LIFO).

(ii) Since warehouse space is limited to 10,000 units
∴ Purchase to be made at year end = 10,000 − 4000
= 6000

∴ Cost of purchase at year end = 6000 × 8
= Rs 48,000

Cl. Stock (10,000) = 3000 × 3 + 4000 × 5 + 3000 × 6
= Rs 47,800

∴ Cl. Stock (6000) = Cl. Stock (10,000) − Cl Stock (4000)
= 47,000 − 14,000
= Rs 33,000

∴ Loss on Purchase at year end = 48,000 − 33,000
= Rs 15,000

∴ Tax Saving on loss = 15,000 × 40%
= Rs 6000 ₹.

100 / 164580 × a 4,000
3060
35280

Date / /

ABC analysis :- (Always better control)

It is one of the inventory control mechanism in which inventory are categorized into three category namely :-

(1) Category A
It is high valued item with low quantity.

(2) Category B
It is middle valued item with middle quantity.

(3) Category C
It is low valued item with high quantity.

The control mechanism used for category 'A' differs with that used for category 'B' and control mechanism used for category 'B' differs with that used for category 'C'. Hence it is also called selective control mechanism.

Statement Showing Rank

Items	Units	Unit cost	Amt	% Amt	% Unit	Rank (on the basis of % Amt)
1	6,000	4.00	24000	14.58%	1.61%	II
2	61,200	0.05	3060	1.86%	16.45%	XII
3	16,800	2.10	35280	21.44%	4.51%	I
4	3,000	6.00	18000	10.94%	0.81%	III
5	55,800	0.20	11160	6.78%	15.0%	VII
6	22,680	0.50	11340	6.89%	6.09%	V
7	26,640	0.65	17316	10.58	7.16%	IV
8	14,760	0.40	5904	3.58%	3.97%	XI
9	20,520	0.40	8208	5.0%	5.51%	X
10	90,000	0.10	9000	5.47%	24.19%	VIII
11	20,940	0.30	8982	5.45%	8.05%	IX
12	24,660	0.50	12330	7.49%	6.63%	V
	372000		164580			

Statement showing ABC Analysis

Rank	Units	% Amt	% Unit	Category
I	3	21.44%	4.51%	A
II	1	14.58%	1.61%	A
III	4	10.94%	0.81%	A
IV	7	10.52%	7.16%	B
V	12	7.49%	6.63%	B
VI	6	6.89%	6.09%	B
VII	5	6.78%	15.0%	C
VIII	10	5.47%	24.19%	C
IX	11	5.45%	8.05%	C
X	9	5%	5.51%	C
XI	8	3.58%	3.97%	C
XII	2	1.86%	16.45%	C

Management Report

Category	Item	% Amt	% Unit
A	1, 3 and 4	46.96%	6.93%
B	6, 7 and 12	24.9%	19.88%
C	2, 5, 8, 9, 10, and 11	28.14%	73.19%

→

% Amt	% Unit	Category	Remark
6.56%	8.65%	C	Qty > Amt
6.65%	6.56%	B	Amt > Qty

Date: / /

Q no 12 From LIFO method :-

Date	Particulars	Receipt			Issued			Balance		
		Qty	Rate	Amt	Qty	Rate	Amt	Qty	Rate	Amt
								500	25	12,500
1st Jan	Opening stock	–	–	–	–	–	–	100		
2nd Jan	Issued	–	–	~~100~~	~~25~~ 100	2500	2500	400	25	10000
3rd Jan	Issued	–	–	–	70	25	1750	330	25	8,250
8th Jan	Issued	–	–	–	80	25	2000	250	25	6250
13th Jan	Received	200	24.50	4900	–	–	–	250	25	6250
								200	24.5	4900
14th Jan	Returned to Store	15	24	360	–	–	–	250	25	6250
								200	24.5	4900
								15	24	360
15th Jan	Shortage	–	–	–	5	24	120	250	25	6,250
								200	24.5	4900
								10	24	240
16th Jan	Issue	–	–	–	10	24	240	280	25	6250
					170	24.5	4165	30	24.5	735
20th Jan	Received	240	24.75	5940	–	–	–	250	25	6250
								30	24.5	735
								240	24.75	5940
24th Jan	Issue	–	–	–	240	24.75	5940			
					30	24.5	735	216	25	5400
					34	25	850			
25th Jan	Received	320	24.5	7840	–	–	–	216	25	5400
								320	24.5	7840
26th Jan	Issue	–	–	–	112	24.5	2744	216	25	5400
								208	24.5	5096
27th Jan	Returned	12	24.5	294	–	–	–	216	25	5400
								208	24.5	5096
								12	24.5	294

	Particular	Receipt			Issued			Balance		
~~28th Jan~~	Received from shortage	Qty	Rate	Amt	Qty	Rate	Amt	Qty	Amt	Rate
27th Jan	Shortage	–	–	–	8	24.5	196	216	25	5400
								208	24.5	5096
								4	24.5	98
28th Jan	Received	100	25	2500	–	–	–	216	25	5400
								208	24.5	5096
								4	24.5	98
								100	25	2500
								528		13094

Q no 18

(i) Inventory turnover for raw material.

$$= \frac{\text{Raw material consumed}}{\text{Average inventory of raw material}}$$

$$= \frac{9,00,000}{\frac{0 + 1,00,000}{2}}$$

$$= \frac{9,00,000}{50,000}$$

$$= 18 \text{ times}$$

(ii) Inventory turnover for finished goods.

$$= \frac{\text{Cost of goods sold}}{\text{Average inventory of finished goods}}$$

$$= \frac{9,00,000}{\frac{0 + 4,80,000}{2}}$$

$$= 3.75 \text{ times.}$$

Efficiency → Output / Input

(iii) Input - output for raw material

$= \frac{\text{Input}}{\text{Output}} \times 100\%$

$= \frac{\text{Raw material consumed}}{\text{Raw material content in finished goods}}$

$= \frac{9,00,000}{1,60,000 \times 5} \times 100\%$

$= 112.5\%$

(iv) Stock - out ratio.

$= \frac{\text{Customer demand that cannot be fulfilled}}{\text{Total demand}} \times 100$

$= \frac{12,000}{1,00,000 + 12,000 + 8,000} \times 100\%$

$= 10\%$

(b) # Inventory turnover for raw material

The turnover ratio of 18 times is a good ratio for the nature of product specified.

Inventory turnover for finished goods

The ratio of 3.75 times is less in comparision to turnover ratio for raw material. The higher the ration the better is profitability position.

Input - output for raw material

This ratio is kept to be as low as possible. The higher ratio results into higher wastage, low quality of product e.t.c.

Stock out ratio (सामान सकेको (सामान फिर्ता आउँदा सामान नभएर)

This ratio is to be kept as low as possible because higher ratio results into profit forgone, loss of goodwill, costomer driven out

Calculation of purchase cost per kg of raw material

The cost incurred on purchase of material from the point of supplier upto the factory premise is included to compute cost of material purchased.

Particulars	Amount
Purchase cost	xx
Less:- Trade Discount	xx
Add:- VAT / Sales Tax	xx
Invoice Price	xx
Add:- Loading Charge	xx
Transportation charge	xx
Custom Duty / Clearing charge	xx
Octroi	xx
Unloading Charge	xx
Total cost of material purchase	xx.

Cost of purchase / kg of Material =

$= \frac{\text{Total cost of Mat Purchase} - \text{Scrap value of M. loss}}{\text{Total Unit} - \text{Normal loss unit.}}$

Note :- Unless question specifies that VAT credit can be taken, VAT is included in cost of material purchase.

Statement showing issue rate of chemical

Particulars	A	B	C
Purchase cost	12,600	19,000	9,500
Add :- Sales Tax (2055 @ 126 : 190 : 95) W.N. Note 1 OR	630	950	475
Freight (1000 @ 3:5:2)	300	500	200
Octori @ 0.1 (2800 ; 4720 ; 1900)	280	472	190
Cartage	—	63.12	31.8
Total Purchase cost (a)	13810	20985.12	10396.8
Qty available for Issue (b) (W.N-2)	2660	4484	1805
Issue Rate (a/b) per kg	Rs 5.19	Rs 4.68	Rs 5.76

Working Note No 1 Cal^n of Sales Tax

$$\% \text{ Sales Tax} = \frac{\text{Sales Tax}}{\text{Total Purchase cost}} \times 100\%$$

$$= \frac{2055}{12600 + 19000 + 9500} \times 100\%$$

$$= 5\%$$

W.N-2 Statement showing Qty available for Issue.

Particular	A	B	C
Qty Purchased	3000	5000	2000
Less :- Shortage (Assume to be normal loss)	200	280	100
Qty available at	2800	4720	1900
Less :- Provision for deterioration (5%)	140	236	95
Qty available for Issue.	2660	4484	1805

Q no 1 Soln :-

Ordering cost = Rs 100 / order

Inventory Carry cost = Purchase cost (P) × % p.a

= 500 × 20%

= Rs 100

Cost of tubes = 500 / tube.

Annual requirement of material = 100 × 52.

= 5200 tubes.

Now,

$$EOQ = \sqrt{\frac{2AO}{C}}$$

$$= \sqrt{\frac{2 \times 5200 \times 100}{100}}$$

= 102 tubes

Relevant cost of EOQ = $\sqrt{2AOC}$

$= \sqrt{2 \times 5200 \times 100 \times 100}$

= 10198.03

= Rs 10198

Relevant cost of ROQ of 1500 units
= Total carrying cost + Total ordering cost - Discount
$= \frac{1}{2} \times ROQ \times C_1 + \frac{A}{ROQ} \times O - (A \times P \times \%\ discount$

$= \frac{1}{2} \times 1500 \times 95 + \frac{5200}{1500} \times 100 - (5200 \times 500 \times 5\%)$

$= 71250 + 346.67 - 130,000$

$= Rs\ (58403.33)$

where,
carrying cost 1 Unit p.a (C_1) = 1% - discount
= 100 - 5% of 100
= 95.

Decision: The offer of supplier to supply quarterly 1500 unit @ 5% discount should be accepted as it results into saving of Rs 58603.33.

Labour Turnover Ratio

(a) Separation Method = $\frac{\text{No of Emp. Separated}}{\text{Avg No of Emp}} \times 100\%$

where,
Avg no of employee = $\frac{\text{No of emp at beginning} + \text{Emp. at end}}{2}$

(b) Replacement method = $\frac{\text{No of Emp Replaced}}{\text{Avg. no of employee}} \times 100\%$

(c) Flux Method = $\frac{\text{No of Separation} + \text{No of replacement}}{\text{Avg. No of Emp}} \times 100\%$

or, $\frac{\text{No of Separation} + \text{No of Accession}}{\text{Avg No of Emp}} \times 100\%$

where,
no of Accession = No of Replacement + No of new recruitment due to expansion.

No of workers recruited and joined

Payment by Result

Payment By Result

Piece Rate System

(i) Straight Piece Rate

Earning = No of units × Piece Rate

(ii) Taylor System

Efficiency
- Less than 100%: Piece rate ⇒ 80% or 83% of Piece Rate
- 100% or More: Piece Rate = 120% or 125% of Piece Rate

(iii) Merrick System

Efficiency
- Upto 83% ⇒ Piece Rate
- 83% – 100% → 110% of Rate
- Above 100% ⇒ 120% of Rate.

Incentive System

(a) Rowan System

Earning = (Time taken × Hourly Rate) + $\frac{\text{Time taken}}{\text{Time allowed}}$ (Time Saved × Hourly Rate)

(b) Halsey System → (kam time) or (standard oleko not garekto)

Earning = (Time taken × Hourly Rate) + 50% of (Time saved × Hourly Rate)

(c) Halsey Weir System

Earning = (" × ") + 30% of (" × ")

(d) Barth Scheme

Earning = $\sqrt{\text{Standard Hours} \times \text{Hourly Rate}}$

Combination of Time and Piece Rate

(i) Gant task system

Output
- Below standard ⇒ Time Rate
- At standard ⇒ 120% of time rate
- Above Standard: 120% of Piece Rate or High wages

(ii) Emerson System

Efficiency
- Upto $66\frac{2}{3}$% ⇒ Basic Wages
- $66\frac{2}{3}$% ⇒ Basic wages + Bonus as per step bonus plan which can go upto 20% of basic wages
- Above 100% ⇒ Basic wages + 20% of basic wages + bonus @ 1%. Additional bonus for every 1% increase in efficiency above 100

(iii) Bedeaux system

Earning = (Time taken × Hourly Rate) + 75% ($\frac{\text{Point Saved}}{60}$ × Hourly Rate)

Step bonus plan (Proportionate)

$66\frac{2}{3}$% —— 80% —— 100%

13.33% ; 33.33%

33.33% ⟶ 20

13.33 ⟶ $\frac{20}{33.33}$ × 13.33%

= 7.99 %.

Q no 4 (a) Actual output = 1,20,000 unit

Actual hrs = 500 hrs.

(kam)

∴ Total Standard Output = 500 × 200

= 1,00,000 units

∴ Excess Prodⁿ over standard = 1,20,000 − 1,00,000

= 20,000 units.

(b) % Incentive Rate = 50% of $\frac{\text{Excess Prod}^n \text{ over standard}}{\text{Std. output}}$

= 50% of $\frac{20000}{100000}$

= 10%.

∴ Bonus Rate / Hrs = 10% of Rs 2

= Rs 0.2 / Hr.

~~Piece rate Hl~~ ~~No of units~~ ~~(o ko krms na huncha hat on the basis of piece)~~

∴ Total Bonus = Total Hour × Hourly Rate

= 500 × 0.2

= Rs 100.

(c) Earning of worker = Basic wages + Bonus

for worker A = (44 × 2.2) + (44 × 0.2) = Rs 105.6

For worker B = (48 × 1.9) + (48 × 0.2) = Rs 100.8

Q no 16

(I) (a) Total Standard Hours reqd for actual output = 30,000 x 2
= 60,000 Hrs

Actual Efficiency = 60%

∴ Actual Hours required = 60,000 / 60% = 1,00,000 Hrs

(b) After use of Jig
Revised Std Time = 120 min (2 x 60) − 12 min
= 108 min

Standard Time मा हो दिएको छ। minutes ma change garko

∴ Total std hours reqd for actual output = 30,000 × 108 / 60
= 54,000 Hrs.

∴ Actual Hours required = 54 000 / 60% = 90,000 Hrs

∴ Time saved = 1,00,000 − 90,000
= 10,000 Hrs

∴ Total labour cost saved = 10,000 x 5 (∵ 40/8 = 5)
= Rs 50,000

∴ Award payable to employee = 50,000 x 3/12
= Rs 12,500

(II) Statement Showing Cost of Production

Part.	Before use of Jig	After use of Jig
Material Cost (30,000 x 2 x 10)	6,00,000	6,00,000
Mat. handling cost @ 2%	12,000	12,000
Labour cost	5,00,000 (1,00,000 x 5)	4,50,000 (90,000 x 5)
Bonus	−	12,500
Overhead	1,000,000 (1,00,000 x 10)	9,00,000 (90000 x 10)
Cost of jig	−	
Total Cost	2,112,000	1,977,500

∴ Total saving in cost = Rs 1,34,500

III The assumption of actual efficiency of 60% holds good even after use of jig.

38)

Statement showing labour cost / article

Scheme	Hour worked	Earning (a)	No of output (b)	Labour cost/article (a/b)
Existing Time Rate	49	8425 (WN-I)	120	70.2
St. Piece Rate	40	8640 (" − II)	135	64
Halsey Scheme	40	8600 (" − III)	135	63.7
Rowan "	40	9007.4 (" − IV)	135	66.72

WN-I Existing Time Rate
Earning = 40 x 160 + 9 x 225 = Rs 8425
(18 x 5) (13 x 13)

WN-II St. Piece Rate
(a) 1 Hr = Rs 160
(b) 5 Hr = 15 article
1 Hr = 3 article
⇒ 3 article = Rs 160
1 " = Rs 53.33
Add:- Increment @ 20% = 10.67
Rs 64.0

agadi formula ko method ma (+) garnu just output X Rate garne

Earning = No of output X Piece Rate
= 135 x 64
= Rs 8640

WN-III

Halsey Scheme

Time allowed for 15 article = 5 Hr

Add: Increment @ 50% = 2.5

7.5 Hr

∴ Total Std. time for actual output = $\frac{7.5}{15} \times 135$

= 67.5 Hrs.

∴ Time Saved = 67.5 − 40 = 27.5 Hr

Earning = (TI × HR) + 50% (TS × HR)

= (40 × 160) + 50% (27.5 × 160) = Rs 8600

WN-IV

Rowan Scheme

Earning = (TI × HR) + $\frac{TI}{TA}$ × (TS × HR)

= (40 × 160) + $\frac{40}{67.5}$ × (27.5 × 160)

= Rs 9007.4 //

Qno 35 Statement Showing Profit

Particulars	Existing	Halsey	Rowan
(19200×11) Sales	211200	211200	211200
Less:- (cost	—		
(19200×8) Material	153600	153600	153600
Variable on	1600 (3200×0.5)	1200 (2400×0.5)	1200
Labour cost	36000 (WN-I)	28000 (WN-II)	30,000 (WN-III)
Fixed cost	9000	9000	9000
Profit	11,000	19,400	17,400

Why 3200 Existing ma aai 2400 Halsey ma and Rowan ?

→ Because 8 Rs is incentive jun Halsey ya Rowan ma matra applicable cha.

WN-I

Existing System

Actual output = 19200 units

Output / Hr = 6 unit / hr.

∴ Time taken = $\frac{19200}{6}$ = 3200 hrs

19200/8 / Normal Hour = 60 × 40 = 2400 Hrs

∴ Overtime hrs = 3200 − 2400 = 800 hrs

∴ Earning = 2400 × 10 + 800 × 10 × 150% [∵ $\frac{400}{40}$ = Rs 10]

= Rs 36,000

WN-II

Halsey Scheme

Actual output = 19200

Output / Hr = 8 unit

Actual time (taken) = $\frac{19200}{8}$ = 2400 Hrs.

Total Standard Hours for actual output = $\frac{19200}{6}$

= 3200 Hrs

∴ Time Saved = 3200 − 2400 = 800 Hrs.

∴ Earnings = (TI × HR) + 50% (TS × HR)

= (2400 × 10) + 50% (800 × 10)

= Rs 28,000

2) 10 + (10 × 1/2) = 15

WN-III

Rowan Scheme

Earning = (TI × HR) + $\frac{TI}{TA}$ (TS × HR)

= (2400 × 10) + $\frac{2400}{3200}$ (800 × 10)

= Rs 30,000.

→ Standard output 10 घंटा worker निकाल्न सक्छ
50 × 10 गर्दछ ।

3(i) Actual Output = 1250
Actual time taken = 25 × 8 × 10 = 2000 Hrs
(Standard hrs for actual output = 1250 × 2
(Actual in terms of standard hrs) = 2500 Hrs

∴ Time Saved = 2500 − 2000 = 500 Hrs.

Earning under
Halsey scheme = (TT × HR) + 50% (TS × HR)
= (2000×2) + 50% (500×2)
= Rs. 4500

Rowan scheme = (TT × HR) + $\frac{TT}{TA}$ × (TS × HR)
= (2000×2) + $\frac{2000}{2500}$ × (500×2)
= Rs 4800

Effective Rate of earning under

Halsey Scheme = $\frac{4500}{2000}$ = Rs 2.25 /Hr

Rowan " = $\frac{4800}{2000}$ = Rs 2.24 /Hr

(ii) Labour Cost /unit under
Halsey Scheme = $\frac{4500}{1250}$ = Rs 3.6 /unit

Rowan " = $\frac{4800}{1250}$ = Rs 3.84 /unit

Existing Piece Rate = Hour /unit × Rate / Hr
= 2×2
= Rs 4

∴ Saving to Mr A in terms of labour cost /unit
Hasley scheme = 4 − 3.6 = Rs 0.4
Rowan " = 4 − 3.84 = Rs 0.16

(iii) % Increment in Earning under

Halsey Scheme = $\frac{4500 - 4000}{4000}$ × 100% (2000×2 = Rs 4000)
= 12.5%.

Rowan Scheme = $\frac{4800 - 4000}{4000}$ × 100%
= 20%.

Though saving to Mr. A is more under Halsey scheme but the assurance of 20% increment over present earning is fulfilled by Rowan scheme. hence, Mr A should follow Rowan scheme.

Q no (4) Let Rs m and y be total cost of material and hourly rate of wages resp.
Then,

Statement Showing Factory cost

Part	Vishnu	Shiva
Material	m	m
Labour (WN-1)	84y	90y
Factory cost OH	600 (60×10)	800 (80×10)
F. Cost	m + 84y + 600	m + 90y + 800

Now,

For Vishnu

$x + 84y + 600 = 7280$

$\therefore x + 84y = 6680$ — (i)

and

For Shiva

$x + 90y + 800 = 7600$

$\therefore x + 90y = 6800$ — (ii)

Solving eqn (i) and (ii)

$x + 90y = 6800$

$x + 84y = 6680$

$6y = 120$

$\therefore y = Rs\ 20$

Putting value of y in eqn (i)

$x + 84 \times 20 = 6680$

$\therefore x = Rs\ 5000$

$\therefore$ Cost of Material = Rs 5000

Hourly rate of wages = Rs 20/Hr.

(ii) Statement showing comparative factory cost

P	Vishnu	Shiva
Mat	5000	5000
Wages:	1680 (84×20)	1800 (90×20)
Factory/Overhead	600	800
Fixed cost / Factory cost	7280	7600

WN-1 Calculation of labour cost

(a) Vishnu (Rowan Scheme):

$$\text{Earning} = (TT \times H/R) + \frac{TT}{TA} \times (TS \times H/R)$$

$$= (60 \times y) + \frac{60}{100}(40 \times y)$$

$$= Rs\ 84y$$

(b) Shiva (Halsey Scheme)

$$\text{Earnings} = (TT \times H/R) + 50\% \text{ of } (TS \times H/R)$$

$$= (80 \times y) + 50\%\ (20 \times y)$$

$$= 90y$$

Qno 9 Statement Showing Earning of workers

Part		A	B
	Basic Wage	100	160
Add:-	Dearness Allowance @50%	50	80
		150	240
Add:-	Employer cont^n to PF & ESI @ 10% of basic (8+2)	10	16
	Normal basic	160	256
Add:-	Overtime wages (WN-1)	15	—
	Total earning	175	256
less:-	Contribution to PF and ESI		
	Employer	10	16
	Employee	10	16
	Net earning	155	224

WN-1 Caln of overtime wages

$= 2 \times \left(\frac{\text{Basic wages} + DA}{\text{Total Hrs}}\right) \times \text{Overtime Hrs}$

$= 2 \times \left(\frac{100+50}{200}\right) \times 10$

$= Rs\ 15.$

(ii) Statement showing allocation of wages to job

Part	Amt	Ratio	X	Y	Z
Worker A					
Normal wages	160	4:3:3	64	48	48
Overtime wages	15	—	—	15	—
Worker B	256	5:2:3	128	51.2	76.8
Total			192	114.2	124.8

Qno 10 Worker A

Days	Hrs	Normal Hrs	Overtime Hrs
Monday	10.5	8	2.5
Tuesday	8.0	8	—
Wednesday	10.5	8	2.5
Thursday	9.5	8	1.5
Friday	10.5	8	2.5
Saturday	—	—	—
Total	49	40	9

∴ Equivalent Normal Hrs $= 40 + 9 \times 1.5$

$= 53.5$ Hrs

(b) Worker B

Total Equivalent Normal Hrs $= 8 \times 5 + 12$

$= 52$ Hrs

(c) Worker C

Total Equivalent Normal Hrs $= 53.5 + 12$

$= 65.5$ Hrs

Statement showing Earning of workers

Particulars	A	B	C
(a) Basic wages/Hr	0.25 (2/8)	0.125 (1/8)	0.375 (3/8)
(b) Dearness All/Hr	0.5	0.5	0.5
(c) Wages/Hr	0.75	0.625	0.875
(d) Total equivalent no Hrs (WN-1)	53.5	52	65.5
(e) Total wages (c × d)	40.125	32.50	57.3125

Qno 11

Soln:-

Rate → All expenses consider but financial bank regular expenses.

No of Employee

11

Statement Showing weekly wages

	P	A
Basic Wages (175 X 180)		3150
Dearness Allowance ($\frac{130}{208}$ X 48 X 180)		5400
Gross		8550
Add Empolyer contribution to		
Provident fund [(8-1.66)% of 8550]	584	
Family Pension [(1.166 % of 8550 X $\frac{1}{2}$)]	50	
ESI (1.25 X 180)	225	859
Add:- Bonus (8.33% of 8550)		712
Total Earning		10121
Less:- Contribution to PF, Family Pension ESI		
Empolyer	859	
Employee	859	
Net Earnings		8403

Statement showing hourly rate of wages

	P	A
Weekly wages		10121
Add:- Statutory leave pay ($\frac{2}{52}$ X 8550)		328.8
Total wages (a)		10449.8
Total Hrs (b) (48 X 180)		8640
Hourly rate of wages ($\frac{a}{b}$)		Rs 1.21

Worker

Qno6 Statement showing earning and rate of Earning

Part	Amar	Akbar	Anthony
(a) Standard time	100	100	100
(b) Actual Hrs	60	70	95
(c) Time Saved (a-b)	40	30	5
(d) % " " ($\frac{c}{a}$ X 100%)	40%	30%	5%
(e) Bonus	20% of Timesaved = 20% of (40X1) = Rs 8	20% of timesaved =20% of (30X1) = Rs 6	10% of timesaved = 10% of (5X1) = Rs 0.5
(f) Basic wages	60	70	95
(g) Earning (e+f)	68	76	95.5
(h) Rate of earning ($\frac{g}{b}$)	Rs 1.13	Rs 1.08	Rs 1.005

Note :- As per sliding scale

(a) Amar (40%)

1st 10% saving of std Hrs i.e 10 Hrs = 10% of (10 X 1) (10% of 100) = Rs 1

Next 10% Saving " " " i.e 10 Hrs = 15% of (10 X 1) = Rs 1.5

Next 20% " " " " i.e 20 Hrs = 20% of (20 X 1) = Rs 4

Bonus Rs 6.5

(b) Akbar (30%)

1st 10% Saving of std Hrs = Rs 1

Next 10% " " " " = Rs 1.5

Balance 10% " " " " = Rs 2

(20% of (10 X 1)) 4.5

(c) Anthony (5%)
1st 5% saving of std Hrs = 10% of (5×1)
= Rs 0.5

Qno 19 Statement showing wages of worker

Worker	Scheme	Wages as per book	Computed Wages	Minimum Wages (72)	Actual Wages (80)	(a or b whichever is higher)
Rajesh	St. piece work	85	80 (WN-I)			
Mohan	" " "	95	91 (WN-II)	88.2	91	
John	" " "	85	85 (WN-III)	82.8	85	
Harish	% bonus plan	120	110 (WN-IV)	88	110	
Mahesh	Emerson	93	100.8 (WN-V)	84	100.8	
Anil	Emerson	126	116 (WN-VI)	80	116.	

WN-I Rajesh. (ST Piece rate).
Earning = No of output × Piece rate
= 400 × 0.2
= Rs 80
Minimum wages = Total Hrs × Base Rate
= 40 × 1.80
= Rs 72.

WN-II Mohan.
Earning = 455 × 0.2
= Rs 91
Minimum wages = (40 × 1.80) + 6 × 1.8 × 150%
= 88.2.

WN-III John
Earnig = 425 × 0.2 = Rs 85
Min wages = (40 × 1.8) + 4 × 1.8 × 150%
= Rs 82.8

WN-IV John Harish (% Bonus Plan)

Efficiency = Actual Prod^n / Hr / Standard Prod^n / Hr × 100%
= 250/40 / 200/40 × 100%
= 125%

Hourly Rate of Earning = 125% of base rate
= 125% of 2.2
= Rs 2.75.

Earning = Total Hrs × Hourly Rate = 40 × 2.75
= Rs 110

∴ Minimum wages = 40 × 2.2 = Rs 88

WN-V Mahesh (Emerson)
Efficiency ratio = 240/40 / 300/40 × 100% = 80%.

Earning = Basic wages + Bonus
= (40 × 2.1) + 20% of (40 × 2.1) = Rs 100.8
Min wages = 40 × 2.1 = Rs 84

WN-VI Anil (Emerson)
Efficiency Ratio = 600/40 / 500/40 × 100% = 120%.

Earning = (40 × 2) + 45% of (40 × 2) = Rs 116
Minin wages = 40 × 2 = Rs 80.

Q no 30

(i) Statement showing earning (Guaranteed Hourly Rate)

Worker	Hours	Rate	Wages
A	38	6	228
B	40	5	200
C	34	7.2	244.8

(ii) Statement showing earning (Piece Rate)

Worker	Earning Piece Rate	50% of Basic Pay	Actual Wages
A	228	114 (50% of 228)	228
B	75	100 (50% of 200)	150 (75% of 200)
C	315	122.4 (50% of 244.8)	315

Note

Worker B

Earning under Piece Rate < 50% of Basic Pay

i.e 75 < 100

Then,

Earning = 75 % of Basic Pay

= 75% of 200

= Rs 150.

(iii) Earning under Rowan Scheme

$= (TT \times H/R) + \frac{TT}{TA}(TS \times H/R)$

Worker A $= (38 \times 6) + \frac{38}{58} \times (38 \times 6) = Rs\ 228$

Worker B $= (40 \times 5) = Rs\ 200$

" C $= (34 \times 7.2) + \frac{34}{52.5}(18.5 \times 7.2) = Rs\ 331.06$

WN-I Calculation of earning (Piece Rate)

(a) Calculation of Piece Rate

Product P $= 12 \times 0.1 = Rs\ 1.2$

Product Q $= 18 \times 0.1 = Rs\ 1.8$

Product R $= 30 \times 0.1 = Rs\ 3.0$

(b) Earning under Piece Rate

A $= 21 \times 1.2 + 36 \times 1.8 + 46 \times 30 = 228$

B $= 25 \times 3 = Rs\ 75$

C $= 60 \times 1.2 + 135 \times 1.8 = Rs\ 315$

WN-II Cal^n of standard time

Worker A $= 21 \times 12 + 36 \times 18 + 46 * 30 = 2280$ Min $= 38$ Hrs

" B $= 25 \times 30 = 750$ min $= 12.5$ Hrs

" C $= 60 \times 12 = 135 \times 18 = 3150$ Min $= 52.5$ Hrs.

25 (i) Statement showing Advantage to employee

	Part	40	45	55	60
(a)	Existing Earning (8×7)	56	56	56	56
(b)	Earning under Piece Rate	52 (40×1.3)	58.5 (45×1.3)	90.75 (55×1.65)	102 (60×1.7)
(c)	Advantage / (loss) to employee (b − a)	(4)	2.5	34.75	46

(11) Statement showing Advantage to Mgmt

Part	40	45	55	60
(a) Existing Piece Rate	1.4	1.4	1.4	1.4
(b) Revised "	1.3	1.3	1.65	1.7
(c) Advantage (loss) to Mgmt (a-b)	0.1	0.1	(0.25)	(0.3)
(d) Advantage / (loss) on wages to Mgmt	4 (0.1 X 40)	4.5 (4.5 X 0.1)	(13.75) (0.25 X 55)	(18) (0.3 X 60)
(e) Saving on OH	- [(40-40) X 2]	10 [(45-40) X 2]	30 [(55-40) X 2]	40 [(60-40) X 2]
(f) Total saving to mgmt (d+e)	4	14.5	16.25	22

WN-I Wages

(a) 1 Hr = Rs 7

(b) 1 Hr = 5 unit

⇒ 5 unit = Rs 7

1 unit = Rs 1.4

WN-II OH

1 Hr = Rs 10

5 Hr = 5 unit

⇒ 5 unit = Rs 10

1 unit = Rs 2.

Qno 47

Let 'T' Hrs be actual time taken

Earning under Rowan System $= (TT \times HR) + \frac{TT}{TA} \times (TS \times HR)$

or, $60T = (T \times 50) + \frac{T}{90} \times [(90-T) \times 50]$

or, $\frac{2}{\cancel{20}}T = \frac{1}{\cancel{5}}\frac{T(90-T)}{9}$

or, $18 = 90 - T$

$\therefore T = 72$ Hrs

$\therefore$ Earning under Halsey Scheme $= (TT \times HR) + 40\%(TS \times HR)$

$= (72 \times 50) + 40\%(18 \times 50)$

$= Rs\ 3960$

Hourly Rate of earning $= \frac{3960}{72} = Rs\ 55.$

Qno 48

Bonus under Halsey Scheme = Bonus under Rowan Scheme

or, 50% of $(TS \times H/R) = \frac{\text{Time taken}}{\text{Time allowed}} \times (TS \times HR)$

$\therefore$ Time taken = 50% of time allowed

When time taken is half of time allowed the bonus under Rowan and Halsey scheme is same.

Proof

$60T - 50T = \frac{5T(90-T)}{9}$

Proof

Statement Showing Bonus.

Time Allowed (a)	Time taken (b)	Time Saved [c=a-b]	Halsey [50% (c×a)]	Rowan [b/a × (c×a)]
4	4	-	-	-
4	3	1	2	3
4	2	2	4	4
4	1	3	6	3

where,
Hourly Rate = Rs 4
Time allowed = 4 Hrs
Each hour is saved progressively

⇒ Rowan scheme is better than Halsey scheme because:-

(1) The tendency of overspeed of work is restricted to 50% of time saved allowed by Rowan scheme in comparision to Halsey scheme which leads to lower wastage and better quality of product.

(2) Under practical sceanrio a worker earns higher bonus when time saved is restricted upto 50% of time allowed under Rowan Scheme in comparision to Halsey scheme.

(3) The full benifit of mistake committed by time setting department is not pass on to Employee under Rowan scheme in comparision to Halsey scheme.

Qno 49

(i) Labour turnover Ratio (Replacement Method) = No of Emp Replaced / Avg. No of employee

or, 5% = 30 / Avg. no of employee

∴ Avg no of employee = 600

(ii) Labour turnover Ratio (Separation method) = No of Emp Separated / Avg. N of emp.

or, 3% = No of emp separated / 600 (WN-1)

∴ No of emp separated = 18.

(iii) Labour turnover Ratio = (No of separation + No of Accession) / Avg no of emp.

10% = (18 + No of accession) / 600

∴ No of accession = 42 employee.

Qno 50

Calc^n of contibution forgone

Particulars		A
(a)	Sales	8,03,300
(b)	P/V ratio	20%
(c)	Contibution (a × b)	160660
(d)	Achal Hours worked	445000
Less:-	Unproductive Hrs (30,000 Productive hrs × 50%)	15,000
		459 000

Piece rate → 1 piece banaune 20 minute.
i.e 60 min ← 1 Hrdai पंसा 9 Rupee.
(20 × 3) minute को 9 rupee.

Part	Amt
(e) Production loss	1,00,000
(f) Contribution forgone $\left(\frac{c}{d} \times e\right)$	Rs 38620

Statement showing Profit forgone

Particulars	Amt
Contribution forgone (WN-1)	38620
Settlement cost due to leaving	9382
Recruitment cost	2674
Selection cost	1275
Training cost	3049
Profit forgone.	5,00,000

1 piece → 20 min
1 hr (60 min) → 3 piece
1 hr → Rs 9

Conclusion 3 piece = Rs 9
1 piece = ?
so piece rate = Rs 3.

26 Statement showing earning (Taylor System)

Particulars	Amar	Akbar	Ali
(a) Actual output	23	24	30
(b) Standard output $\left(\frac{60}{20} \times 8\right)$	24	24	24
(c) Efficiency $\left(\frac{a}{b} \times 100\%\right)$	95.83	100%	125%
(d) Piece Rate	80% of Piece Rate = 80% of 3 = Rs 2.4	120% of 3 = Rs 3.6	120% of Piece rate = Rs 3.6
(e) Earning (a×d)	Rs 55.2	Rs 86.4	Rs 108.

Piece rate = Piece / Time

i.e outer piece 3 / Rs 9 = Rs 3 per piece para aaya.

1 piece = 20 minute
20 min = 1 piece
1 hrs (60 minutes) = 24 piece
60 mins = 3 piece.

Q no 30 Statement showing Earning (Emerson System)

Part	A	B	C
(a) Actual output	25	40	45
(b) Standard output (8×5)	40	40	40
(c) Efficiency Ratio (a/b × 100%)	62.5%	100%	112.5%.
(d) Basic wages	50	50	50
(e) Bonus	—	20% of Basic Wages = 20% of 50 = Rs 10	20% of basic wages + 12.5% of basic wages = 32.5% of 50 = Rs 16.25.
(f) Earnings (d+e)	50	60	66.25.

Q no 42 Soln:-

Time allowed = $\frac{\text{No of units produced and approved}}{\text{Standard output per hour}} = \frac{2000 \text{ units}}{40 \text{ units}}$ (Std hr)

= 50 hrs.

Time worked.

1 : 4 : 11 = 9 hrs
2 : 4 : 11 = 9 hrs
3 : 4 : 11 = 9 hr
4 : 4 : 11 = 9 hr
5 : 4 : 11 = 4 hr
40 hrs

Time saved 10 hrs

Renumeration as under :-

(1) Halsey plan = Time wage + Bonus
= (40×25) + (10 × 25 × 40 %)
= 1100

(2) Rowan plan = Time wage + Bonus
= (40×25) + $\left(\frac{40}{50} \times 10 \times 25\right)$
= Rs 1200 //

Practise manual

Q no 17 (i) $EOQ = \sqrt{\frac{2AO}{C}}$

where,
A = Annual requirement of material = 17200 kg
O = Ordering cost / order = Rs 720
C = Carrying cost 1 kg p.a
= 13.76% of 125
= Rs 17.2

$\therefore EOQ = \sqrt{\frac{2 \times 17200 \times 720}{17.2}}$
= 1200 kg
∴ ROQ = EOQ − 200
= 1200 − 200
= 1000 kg

(ii) Max stock = ROL − (Min cons × Min lead time) + ROQ
= 560 − (30 × 4) + 1000
= 1440 kg

where,
ROL = Max con × Max^m lead time
= 70 × 8
= 560 kg
Max cons = Avg cons + 20
$= \frac{18250}{364} + 20$
= 70 kg
Avg con = $\frac{\text{Max}^m \text{ con} + \text{Min consum}}{2}$
or, 50 = $\frac{70 + \text{Min cons}}{2}$
∴ Min cons = 3 kg

(iii) Min Stock level = ROL − (Avg cons × Avg lead time)
= 560 − $\left(50 \times \left(\frac{4+8}{2}\right)\right)$
= 260 kg

(iv) Relevant cost at EOQ = $\sqrt{2AOC} = \sqrt{2 \times 17200 \times 720 \times 17.2}$
= Rs 20640
Relevant cost at ROQ of 1000 kg = Total carrying cost + Total ordering cost
$= \frac{1}{2} \times 1000 \times 17.2 + \frac{17200}{1000} \times 720$
= Rs 20984
∴ loss incured by co = 20984 − 20640 = Rs 344.

WN 1
(a) O S + Prodn = C/S + Sales
or, 900 + Prodn = 0 + 10,000
∴ Prodn = 9100 unit

(b) Raw Mat Consumed (9100 X 2) 18200

Add: CIS of RM —

Less:- CIS of RM 1000

Raw material Purchased 17200

Qno22 We don't agree with the ogument of chief accountant as the closing stock value changes with change in method of issue however in the above case the closing stock value remains same irrespective of change in method because the closing stock remains from the purchase of june only.

(June)

@ CIS unit = 2500 - 2300 = 200 unit

CIS unit = 1900 - 1900 = ~~0~~ unit. NIL

(May)

Qno26

Soln:-

Let 1 kg of product A be produced

Then,

loss on material = 25% of 1

= 0.25 kg

∴ Total input of material = 1 + 0.25 = 1.25 kg

∴ Portion of material A X E = 1.25 X 50% = 0.625 kg

" " " B X E = 1.25 X 50% = 0.625 kg

Statement showing SP

Particulars	Amount	
Material		
A X E (0.625 X 150)	93.75	
B X E (0.625 X 90)	56.25	150
Prodn Exp @ 40%.		60
Total cost		210
Add: Margin @ 20%		42
S.P		252

Since the S.P and profit is to be maintained at existing level, hence, total cost remains same further material and production exp are in the ratio of 100:40 ; hence total material cost must also be same i.e Rs 150.

Now,

Let 1m kg of material C X E be introduced

Then,

Portion of material A X E = (1.25 - m) kg

Now,

(1.25 - m) X 150 + m X 75 = 150

187.5 - 150m + 75m = 150

or 75m = 37.5

∴ m = 0.5

∴, Portion of material A X E = 1.25 - 0.5 = 0.75

" " " C X E = 0.5

∴ Ratio of A X E and C X E = 0.75 : 0.5

= 3 : 2

Qno 19 soln:-

Difference between Minimum lead time and maximum lead time = 4 days

Max lead time - Min lead time = 4 days

or Max lead time = Min lead time + 4 days —(i)

Average lead time is given as 6 days i.e

$$\frac{\text{Max lead time} + \text{Min lead time}}{2} = 6 \text{ days} \quad \text{—(ii)}$$

Putting the value of (i) and (ii)

$$\frac{\text{Min lead time} + 4 \text{ days} + \text{Min lead time}}{2} = 6 \text{ days}$$

or, min lead time + 4 days + Min lead time = 12 days

or, 2 Min lead time = 8 days

or, Min lead time = $\frac{8 \text{ days}}{2}$ = 4 days

Putting this min lead time value (i), we get

Maximum lead time = 4 days + 4 days = 8 days

(i) Maximum comption per day.

Re order level = Max Re-order period + Max cons per day

160,000 = 8 days × Max. Consuption per day

or Max consuption per days = $\frac{160,000}{8 \text{ days}}$ = 20,000 units

(iii) Min consuppion per day.

Max Stock level =

Reorder level + Re-order quantity − (Min lead time × Min consp per day)

or, 1,90,000 = 1,60,000 units + 90,000 units − (4 days × Min consumption per day)

or, 4 days × Min consumption per day = 250,000 − 1,90,000 units

or, Minimum consumption per days = $\frac{60,000 \text{ units}}{4 \text{ days}}$ = 15,000 units

Qno 27 Soln:-

Calculation of Purchase cost per kg of Materials:

	Wholesale Market	Farmers.
Mustard		
Purchase price	15.00	12.50
Add:- Central Sales Tax @ 2%	0.30	—
Add:- Loading cost	0.20 (10÷50 kg)	0.40 (5÷50)
Add:- Unloading cost	0.04 (2÷50 kg)	0.04 (2÷50 kg)
	15.54	12.64.
Soybean:-		
Purchase price	11.0	9.00
Add:- Loading cost	0.20 (10÷50 kg)	0.06 (3÷50 kg)
Add:- Unloading cost	0.40 (2÷50 kg)	0.04 (2÷50) kg
	11.24	9.10.
Olive		
Purchase price	36.00	₹8.00
Add:- Import duty @ 10%	—	2.80.
~~Add:- Import duty @ 10~~		
Add:- Loading cost	0.20 (10÷50 kg)	0.50 (25÷50 kg)
Add:- Unloading cost	0.40 (2÷50 kg)	0.04 (2÷50 kg)
	36.24	31.34.

(ii) Economic Order Quantity

Annual Requirement (A)

Commodity		Quantity
Mustard	(45,000 x 5 x 12 mths)	2700,000
Soybean	(15,000 x 6 x 12 mths)	10,80,000
Olive	(3,000 x 4.5 x 12)	1,62,000

Cost per Order (O):

	Wholesale Market (	Farmer
Mustard:-		
- Transportation cost	6,000	15,000
- Sorting and piling cost	—	1,200
	6,000	16,200
Soy bean		
- Transportation cost	9,000	12,000
- Sorting and piling cost	—	800
	9,000	12,800
Olive		
- Transportation cost	3,000	11,000
- Sorting and piling cost	1,800	—
	4,800	11,000

Carrying cost per kg. per annum (C x i):

	Wholesale Market	Farmers
Mustard		
- Inbost on cash credit	1.9425	1.5800
	(15.54 x 12.5%.)	(12.64 x 12.5%
- Warehouse rent	1.0000	1.0000
	2.9425	2.5800

Soybean

Qno3 Statement showing data

Employee	Beginning	Joined	dept.	End	Replaced
Data Processor	540	1080	60	1560	60
Payroll Processor	80 (B_{13})	20	60	40	20
Supervisors	30 (B_4)	60	–	90 (BF_6)	–
Voice Agents	30 (B_{14})	20	20	30 (BF_5)	20
Assistant Managers	20	20	10	30	10
Senior Voice Agents	4	8	–	12	–
Senior Data Processors	8	26	–	34	–
Team leaders	60	–	60	0	–
	772	1234	210	1796	110

where,

Asst. Manger = $\frac{2}{8}$ of Total

or, 20 = $\frac{2}{8}$ of Total

∴ Total = 80

Supervisor 30 ($80 \times \frac{3}{8}$)

Voice Agent 30

Ast Manger $\frac{20}{80}$

Labour turnover Ratio

(a) Separation Method = $\frac{\text{No of emp separated}}{\text{Avg no of emp}} \times 100\%$

$= \frac{210}{1284} \times 100\%$

$= 16.36\%$

where,

Avg no of emp = $\frac{\text{Emp at beginning} + \text{Emp at end}}{2}$

$= \frac{772 + 1796}{2}$

$= 1284$

(b) Replacement Method = $\frac{\text{No of Emp replaced}}{\text{Avg No of emp}} \times 100\%$

$= \frac{110}{1284} \times 100\%$

$= 8.57\%$

(c) Flux Method = $\frac{\text{No of separation} + \text{No of accession}}{\text{Avg No of emp}}$

$= \frac{210 + 1234}{1284} \times 100\%$

$= 112.66\%$

Qno3 (a) Total Hour for Training = 50,000

Hours / Unit = 10 hrs

∴ No of Possible production unit by experienced worker = $\frac{50000}{10}$

$= 5000$ unit

∴ Actual output during training period = 60% of 5000

$= 3000$ unit

∴ Defective units = 20% of 3000 = 600 unit

Cost of Rectification = 600×25 = Rs 15,000

(b) Hours lost = 100,000 hrs

∴ Possible production unit = $\frac{100,000}{10} = 10000$ unit.

∴ Total unit lost on account of labour = 10,000 + (5000 - 3000)
turnover = 12000 unit

∴ Contribution = Rs 36

∴ Total Cont^{n} foregone = 12000 × 36
= Rs 4,32,000

Statement showing profit foregone

Particulars	Amount
Cont^{n} foregone	4,32,000
cost of rectification	15000
Settlement cost	183480
Recruitment cost	136340
Training cost	113180
Profit foregone	9,00,000

Qno22 Statement Showing loss to company

Particulars	Margaret	Jennifer	Total
(a) Standard Hrs	(30×2) 60	(42×2) 84	
(b) Actual Hrs	28	40	
(c) Time Saved (a-b)	32	44	
(d) Loss to company (Halsey system)	220 [(28×5)+50%(32×5)]	310 ↓ [(40×5)+50%(44×5)]	530

(ii) Statement showing loss to company (Rowan System)

Part.	Margaret	Jennifer	Total
a) Actual Hrs	28	40	
b) Time Saved	32	44	
c) Loss to company	214.67 [28×5 + 28/60 × (32×5)]	304.76 [(40×5) + 40/84 × (44×5)]	519.43

(iii) Statement Showing saving

Particulars	Margarita	Jennifer	Total
Loss to company (Halsey scheme)	220	310	530
Less:- loss to company (Rowan Scheme)	214.67	304.76	519.43
Saving to Co.	5.33	5.24	10.57

Qno26 Statement showing earning (Tyalor system)

Particulars	Worst Case	Optimal	Best
(a) Actual output	42400	84960	1,27,400
(b) Actual hrs (US×4×118)	21,240	21,240	21,240
(c) Standard Prod^{n} (4×b)	84960	84960	84960
(d) Efficiency ($\frac{a}{b}$×100%)	49.9%	100%	149.9%
(e) Piece rate	80% of Piece Rate = 80% of 12.5 = Rs 10	120% of Piece Rate = 120% of 12.5 = Rs 15.	120% of Piece Rate = Rs 15

Apportionment ra allocation का लागि 36 ra 39 gare पुग्छ ।

(f)	Earning (a X e)	424000	12,74,400	19,11,000
(g)	wage / employee	Rs 8593.22	10800	16194.92

Statement showing earning (Halsey scheme)

Particulars	Worst cost	Optimal	Best
(a) Actual hrs	21240	21240	21240
(b) Standard Hrs for actual output	10600 ($\frac{42400}{4}$)	21240 ($\frac{84960}{4}$)	31850 ($\frac{127400}{4}$)
(c) Time saved	–	–	10610
(d) Earning [(a x 50) + 50%	1062000	10,62,000	1327250
(e) Wages / Employer ($\frac{d}{118}$)	Rs 9000	Rs 9000	Rs 11247.88

(ii) worker K (Taylor system)

$$\text{Efficiency} = \frac{\text{Actual output}}{\text{Stad output}} \times 100\%$$

$$= \left(\frac{1050}{720}\right) \times 100\%$$

$$= 145.83\%$$

where,

Std output = (45 X 4) X 4 = 720

∴ Earning = No of output X piece Rate

= 1050 X (12.5 X 120%)

= 15 9750

Halsey scheme

Std hrs for actual output = $\frac{10.50}{4}$

Actual Hrs = 45 X 4 = 180

∴ Time saved = 262.5 − 180

= 82.5 hrs

Earnings = (TT X H)R) + 50% (TS X H)R)

= (180 X50) + 50% (82.5 X50)

= Rs 11062.5

∴ The worker 'k' should not support the worker's demand as his earning under new scheme will be less.

Overhead

→ Sum of indirect expense

- Function basis
  - → Prodⁿ OH / Manufacturing OH / Factory OH
  - → Administrative OH
  - → Selling and Distⁿ OH
- Behaviour Basis
  - → Fixed OH
  - → Variable OH
  - → Semi-variable OH
- Element basis
  - → Indirect Material
  - → " Labour
  - → " Expenses

Segregation of semi-variable Over head

Variable OH / unit = $\frac{\text{Diff in OH}}{\text{Diff in units/Activity level}}$ → Diff in V.OH

Case I	I	II
Ouput	5000	7000
Overhead	15,000	19,000

Find fixed OH.

soln:-

Variable OH / unit = $\frac{\text{Diff in OH}}{\text{Diff in units.}}$

= $\frac{19,000 - 15,000}{7000 - 5,000}$

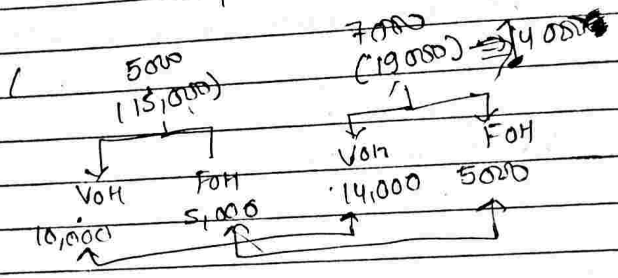
= Rs 2/unit.

At year 2

Total OH = VOH + FOH

15000 = 5000 × 2 + FOH

∴ unit cost FOH = 5000.



Case II

	I	II
Output	5000	7000
Overhead	15,000	20,000

The fixed OH in year II is more by Rs 1000 find fixed OH.

soln:-

$$VOH/unit = \frac{\text{Diff on OH}}{\text{Diff in unit}}$$

$$= \frac{(20,000 - 1000) - 15,000}{7000 - 5,000}$$

= Rs 2/unit

At year 2

TOH = VOH + FOH

15000 = 5000 × 2 + FOH

= Rs 5000

Fixed overhead = 5000 + 1000

(Year II) = Rs 6000

• Case III

	I	II
Output	5000	7000
Overhead	15,000	20900

The price in year II has increases by 10%. find fixed OH.

$$\text{OH of year II at year I price} = \frac{20900}{110\%} = \text{Rs } 19,000$$

$$VOH/unit = \frac{19,000 - 15,000}{7000 - 5000} = \text{Rs } 2/unit.$$

At year I.

Total OH = FOH + VOH

15000 = F(OH) + 5000 × 2

F(OH) = 5000

(Machine Hr रहेको हुन्छ [illegible] question han game)

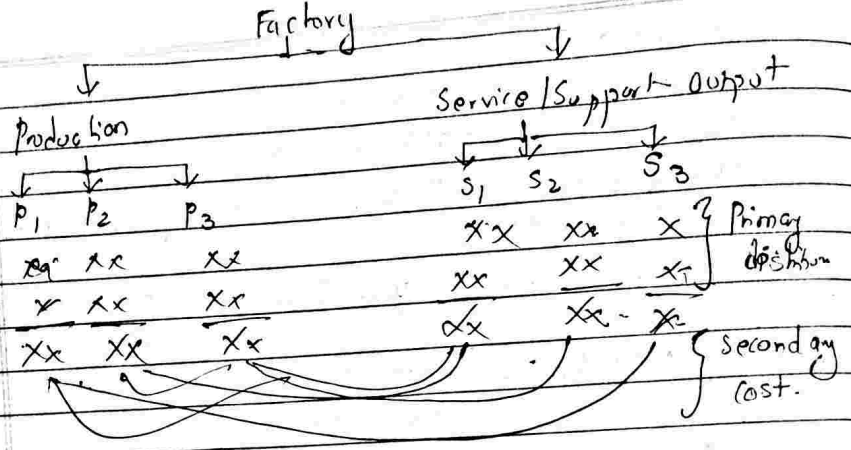
Apportionment and allocation

Allocation is the process of charging expense incurred to a cost centre for which it was incurred.

Apportionment is the process of charging common expenses incurred to different cost centres on some equitable basis.

Primary and Secondary Distribution of overhead

Primary distribution is the allocation or apportionment of overhead incurred to both production and service department on some equitable basis. Secondary distribution is the apportionment of overhead of service department to production department on some equitable basis.



(1) Direct Method

Here the service provided by one service department to other service department is totally ignored and overhead of service department is directly apportioned to production department.

Part	Production Dept			Service Dept		
	P_1	P_2	P_3	S_1	S_2	S_3
OH as per Primary distribution	10,000	10,000	10,000	10,000	10,000	10,000
App. of OH of Dept S_1	3000	3000	4000	(10,000)	-	-
App. of OH of Dept S_2	3000	4000	3000	-	(10,000)	-
App of OH of Dept S_3	4000	3000	3000	-	-	(10,000)
	20,000	20,000	20,000	-	-	-

(11) Step ladder / Step down / Non Reciprocal Method.

Here the service rendered by one service dept. to other service dept is considered but no further allocation is made to that service dept. which overhead has already been distributed.

The service dept which provides maximum number of service to other dept is allocated first and so on.

Part	Prod. Dept			Service Dept		
	P_1	P_2	P_3	S_1	S_2	S_3
OH as per Production Dept	10,000	10,000	10,000	10,000	10,000	10,000
App of OH of Dept S_1	2000	2000	2000	(10,000)	2,000	2000
App of OH of Dept S_2	3000	3000	3000	-	(12000)	3000
App of OH of Dept S_3	5000	5000	500	-	-	(15,000)
Total OH	20,000	20,000	20,000	-	-	-

(111) Reciprocal Method

Here the service department which provides service to other service department is considered and further allocation is made to that service department which overhead has already been distributed.

(1) Repeated Distribution Method
(2) Simultaneous eqn Method

Basis for apportionment of overhead

Expense	Basis
(1) Rent, Depn, Repair and Maintainance and Insurance of Factory Building	Floor Space Occupied
(2) Depn, Repair and Maintainance and insurance of plant and machinery	Capital Value of assets.
(3) Power	Kilowatt. hrs / Hp of machine / Composite ratio (Hp X Machine hr)

	Part (Expense)	Basis
(4)	Lighting	Number of light points / floor space.
(5)	Indirect wages	Direct wages
(6)	Staff welfare / Canteen Service	Number of worker
(7)	Staff insurance	Direct wages
(8)	Sundries / Mis. expense	Machine hour / Direct wages / Direct labour hour

Qno 15 (i) Statement Showing Apportionment of on (Direct Method)

Part	Amt	Ratio	Machining	Finishing
App of on HR	5,09000	4:5	2 22222	277778
" on of Maint.	460,000	35:40	214667	245333
" " " Design	700,000	45:15	525,000	1,75,000

(ii) Statement Showing App of on (Step ladder Method)

Part	Ratio	Prodn		Servie	
		Machining	Finishing	HR	Maintainance	Design
OH as per Primary Dist"		—	—	500000	459000	700,000
App of OH of HR Dept	40:50:5:5	200,000	250,000	(500000)	25000	25000
App of OH of Main Dept	35:40:5	212187.5	242500	—	(484000)	30312.5
App of OH of Design	45:15	566484.5	188828	—	—	(755312.5)
Total		978672	681328	—	—	—

(iii) The service dept which provides maximum number of service to other department is allocated first and so on. Accordingly HR provides maximum number of servie to other dept and then by maintainance dept and so on. Hence the proper sequence for apportionment is HR, Maintainance and design.

Qno 25 Statement Showing Apportionment of OH (Repeated Dist")

				Prodn Dept			Service Dept	
Part	Amt	Basis	Ratio	A	B	C	X	Y
Power	2400	kW Hr	20:22:8:7:5:2:5	800	880	320	300	100
Rent	4200	Area	4:4:3:2:1	1200	1200	900	600	300
Canteen	3000	No of workers	9:12:3:4:2	900	1200	300	400	200
Personal dept	3000	"	"	900	1200	300	400	200
Time Office	1000	"	"	300	400	100	133	67
Maintainance of building	2400	Area	4:4:3:2:1	686	686	514	343	171
Fire protection service	1200	Capital value	5:6:4:3:2	300	360	240	180	120
Insurance of assets	1000	"	"	250	300	200	150	100
Depn	10% of Capital Value			5000	6000	4000	3000	2000
Total OH as per Primary Distribution				10336	12226	6874	5506	3258
App of OH of Dept X			15:30:25:20	1376.5	1651.8	1376.5	(5506)	1101.2
" " " " Y			40:20:30:10	1743.7	871.8	1307.8	4359	(4359.2)
" " OH " " X			25:30:25:20	108.9	130.9	108.9	(435.9)	87.2
" " OH " " Y			40:20:30:10	34.9	17.4	26.2	8.7	(87.2)
" " " " " X			25:30:25	2.7	3.3	2.7	(8.7)	—
Total OH				13602.7	14901.2	9696.1	—	—

Alternatively (Simultaneous eqn Method)

X lai पाउने

Y le dine

10%

so Total overhead hamro $x = (5506) + Y$ le deko i.e. 10% of — vainaso

Let Rs x and Rs y be total OH of Dept X and Y resp.

For Dept X

$x = 5506 + 10\%$ of y

$x - 0.10y = 5506$ —— (i)

For Dept Y

$y = 3258 + 20\%$ of x

or, $y - 0.2x = 3258$ —— (ii)

Solving eqn (i) and (ii)

$x - 0.1y = 5506$ } × 0.2

$-0.2x + y = 3258$ } × 1

$0.2x - 0.02y = 1101.2$

$-0.2x + y = 3258$

$0.98y = 4359.2$

$\therefore y = Rs\ 4448.16$ — yo same aaucha nai

Putting the value of y in eqn (i)

$x - 0.1 \times 4448.16 = 53306$

$\therefore x = Rs\ 5950.8$

Statement Showing Secondary Destbn

Particular	Ratio	A	B	C	X	Y
OH as per primary Distribution		10336	12226	6874	5506	3258
App. of OH of Dep X	25:30:25:20	1487.7	1785.2	14877	(5950.8)	1190.16
App of OH on Dep Y	40:20:30:10	1779.3	889.6	1324.5	449.8	(4448.16)
Total OH		13603	149008	9686.2	—	—

yo

Repetative 5638.92

sahai lekhe

(x) ⇄ (y)

Q no 36 Statement Showing Apportionment of OH (Step-ladder Method)

Particular	Basis	Ratio	X (Production)	Y (Production)	Z (Production)	P (Service Dept)	Q (Service Dept)	R (Service Dept)	S (Service Dept)
OH as per prime Distribution			193000	64000	83000	45000	75,000	105,000	30000
App of OH of Dep P	Noofemp	100:125:85: 50:40:50	10,000	12500	8500	(4500)	5000	4000	5000
" " " " Q	DL Hrs	4:3:4:6:3	16000	12000	16000	→	(80000)	24,000	12000
" " " " R	Area	3:1:5:1:5:1	57000	28500	28500	—	—	(135000)	19000
" " " " S	DL. Hr	4:3:4	24,000	18000	24000			—	(66000)
Total OH			309,000	1,35,000	169000	—	—	—	—
Direct L. Hr			4000	3000	4000				
OH. Recovery Rate / Hr			Rs 75	Rs 45	Rs 40				

8.33 service to Administration पाउनी vayo.

Q no 38 Statement Showing Apportionment of OH (Direct Method)

Part	Amt	Basis	Ratio	Corporate Sales	Consumer sales
OH as per Primary Distribution				1297751	636818
App of OH of Admn	94510	No of emp	42:28	56706	37804
" " " Info System	304720	Processing time	24:20	166211	138509
Total					

(b) % Service Rendered by

Adm Dept to Info System (No of emp) $= \frac{21}{42+28+21} \times 100\%$

$= 23.07\%$

Info System to Adm Dept (Processing time) $= \frac{400}{2400+2000+400} \times 100\%$

$= 8.33\%$

Rank	Dept
I	Adm Dept
II	Inf. System

Statement showing App. of OH (Step ladder Method)

Part	Basis	Ratio	Corporate Sales	Consumer Sales	Adm	Info System
OH as per Primary Distb^n			1297751	636818	94510	304720
App of OH of Adm^n	No of Emp	42:28:21	43620	29080	(94510)	21810
" " Info System	Processing Time	24:20	178107	148423	—	(326530)
Total OH			—	—	—	—

(c) Support dept can be ranked differently on the basis of Rupee amount of service rendered by one sere dept to other service dept

Amount of Service rendered by

Adm Dept of Info system $= 94510 \times \frac{21}{42+28+21} = RS\ 21810$

Info System to Adm Dept $= 304720 \times \frac{400}{2400+2000+400} = RS\ 25393$

Rank	Dept
I	Inf System
II	Adm Dept.

Statement showing App of OH (Repeated Distribution Method)

Part	Ratio	Corporate Sale	Consumer Sale	Adm	Info system
OH as per Primary Dis		1297751	636818	94510	304720
App of OH of Adm	42:28:21	43620	29080	(94510)	21810
" " " Info System	24:20:4	163265	136054	8721	(326530)
" " Adm	42:28:21	12559	8373	6021	6279
" " Info syst	24:20:4	3140	2616	8523	(6279)
" " Adm	42:28:21	241	161	(523)	121
" " Info system	24:20	66	55	—	(121)
		—	—	—	—

Similtaneous Equation method

Suppose the total OH of Adm and Info system is x and y resp.

$\therefore x = 94510 + 8.33\%$ of y

i.e $x = 94510 + 0.0833y$ — (i)

$y = 304720 + 23.07\%$ of x

$\therefore y = RS\ 304720 + 0.2307x$ — (ii)

$y = \frac{32\,6523.5}{0.9807}$

$= RS\ 332,950$

~~$\therefore x = E + 22,245$~~

From eqn (i) and (ii)

$y = 304720 + 0.2307(94510 + 0.0827y)$

$\therefore y = 304720 + 21803.5 + 0.01921$

$\therefore x = 1,22,245$ [from eqn I]

2160

Statement showing Appointment of OH

Particulars		Corporate sale	Consumer sale	Administrative	Information
Amount as per primary distribution		12,97,751	636,818	94510	304720
Appointment of OH of Adm exp	[42:28:21]	56421	37,614	(122245)	28230
Appn of OH of Info	[24:20:4]	166470	138725	27,755	(33 2950)
	Total →	1520,642	815157	—	—

Qno 39

Statement showing Apportionment of OH

Particulars	Amt	Basis	Ratio	Production Dept M_1	M_2	A_1	Service Dept Store	Engineering	General Engg
Indirect wages				46520	41340	16220	8200	5340	7520
Consumable service				12600	18200	4200	2800	4200	3200
Depn	89600	Book value of Machine	120:90:30 12:36:12	15840	11880	3960	1584	4752	1584
Insurance of Mach	7200	"	11	2880	2160	720	288	864	288
Insurance of Build	2160	Area	8:6:2:2:2	1080	648	864	216	270	162
			(3240 × 2/3)	(3240 × 1/3)					
Power	6480	HP Hrs	50:35:5:0:10:0	3240	2268	324	—	648	—
Light	5400	Area	5:6:8:2:2:5:1.5	1080	1296	1728	432	540	324
Rent	12675	"	"	2535	3042	4056	1014	1267	761
Additional Rent (6000×8%)	480	General Service Dept		—	—	—	—	—	480
		Total OH		85775	80834	32072	14534	17881	14319

Store Dept = Issue of material vanera = consumable supply ko info deko chaina
Engg Dept = capacity (M·Hr) because tesma ni ko info deko chaina
General = production (D·L) → prodn Direct labour and capacity M·hr ko info aru ma use hundaina apportionment of overhead ko department ma.

(11) and (10) Statement Showing App of OH (Direct Method)

Particulars	Amt	Ratio	Prod Dept M_1	M_2	A_1
OH as per Primary Distn			85775	80834	32072
App. of OH of Store Dept	14534	126:182:42	5232	7558	1744
App of OH of Engineering Store Dept	17881 (M·Hr)	4:5	7947	9934	—
" " " of General Service Engineering Dept	14319 (L·Hr)	20:15:30	4406	3304	6609
Total OH (a)			103360	101630	40425
Hours (b)			40000 Hrs	50,000 Hrs	30,000 Hr
OH Absorption Rate (a/b)			Rs 2.584/Hr	Rs 2.033/Hr	Rs 0.135/Hr

(111) Statement showing OH

Particulars	Rate	Hrs	Amt	Hrs	Amt
M_1	2.584	10	25.84	6	15.504
M_2	2.033	4	8.132	14	28.462
A_1	0.135	14	1.89	18	2.43
Total OH			35.862		46.396

⇒ Over/Under Absorption of OH

If the absorbed overhead is more than actual overhead incured then this is the case of over absorbtion of overhead.

If the absorbed overhead is less than actual overhead incured then this is the case of under absorbtion of overhead.

Example :-	Case I	Case II
a) Actual OH Incurred	1,00,000	1,00,000
b) Absorbed OH	110,000	90,000
(c) (Over) / Under absorption of OH (a-b)	(10,000)	10,000

Accounting treatment of over/under absorption of over-head

① Carried forward to next accounting period
Here, the over/under absorption of overhead is carried forward to next accounting period. The limitation of this method is that the over/under absorption of overhead due to unit sold is also carried forward to next accounting period thereby violating matching concept.

② Charged costing P/L A/C
Here, The over/under absorbtion of overhead is charged to costing P/L A/C. The limitation of this method is that the over/under absorption of overhead due to units unsold is also charged to costing P/L A/C. Thereby violating matching concept.

③ Use of supplemetary rate
This is the best method as it fulfills the limitation of both the above method. Here, a supplementary rate is computed as:-

$$\text{Supplementary rate} = \frac{\text{Balance over/under absorbed overhead}}{\text{Equivalent production unit}}$$

where balance over/under absorbed overhead = Total over/under absorbed — Over/Under

Equivalent production unit = Total finish unit + Equivalent finish unit for closing WIP

And, is charged to ① cost of sales for units sold.
② Closing stock for units unsold
Note :- The over/under absorption of overhead due to abnormal reason is charged to costing P/L A/C.

① Note :- The actual overhead must be actual normal overhead i.e any abnormal item should be excluded.

② The actual overhead always computed on the basis on actual base on the basis of which absorption rate has been calculated.
Eg :- Absorped overhead = Absorption rate/machine hr X Actual machine hr.
= Absorption rate/unit X Actual unit.
M.Hour

Q no 20 ⓐ Calculation of Actual normal Prodⁿ OH

Actual OH Incurred	6,00,000
less:- Obsolute store w/o	45,000
Wages paid during strike	30,000
	5,25,000

ⓑ Absorbed OH = OH Absorption Rate X Actual M.Hr
= 10 X 48000
= Rs 480,000
∴ Under Absorption of OH = 525000 − 480,000
= Rs 45,000
Since 1/3rd of under absorption of OH is due to defecting planning.

∴ Under absorption of OH charged = 45,000 × 1/3
to costing P/L = Rs 15,000

∴ Balance under absorption of OH = 45,000 − 15,000
= Rs 30,000

(c) Supplementary Rate = Balance under absorption of OH / Equivalent prodn unit

= 30,000 / 20,000 + (8000 × 50%)

= Rs 1.25 / Eq Prodn unit

∴ Under absorption of OH charged to

(i) Cost of sales = 18000 × 1.25 = Rs 22500
(For unit sold)

(ii) Closing stock
Finished goods = 2,000 × 1.25 = Rs 2500
WIP = 4000 × 1.25 = Rs 5000

(iii) Costing P/L = Rs. 15,000
Rs 45,000

(iii) Journal entry

Cost of sales AIC	Dr	22500
F. Cost control AIC	Dr	2500
WIP control	AIC Dr	5000
Costing P/L AIC	Dr	15,000
To Prodn on control AIC		45,000

(Being under absorbed on Adjusted)

(iv) Impact of profitability
Cost of sales and costing P/L AIC being debited by Rs. 22500 and 15,000 respectively decreases profit by Rs. 37,500.

Overtime

The hours worked before and after the normal hours is overtime hours. The worker is entitled for overtime premium if he works for more than 8 hours per day or 48 hrs/week whichever is more benificial to worker. During overtime a worker is entitled for overtime premium at the rate 50% of basic wages per hour.

Accounting treatment for overtime premium

(1) Overtime worked regularly throughout the period as a policy due to labour shortage:-
– Overtime premium is treated as part of labour cost and charged to job at an inflated wage rate.

(2) Overtime worked at the request of customer
– Overtime premium charged to job concerned.

(3) Overtime worked to meet shortfall in requirement due to abnormal reason.
– Overtime premium charged to costing P/L AIC.

(4) Overtime worked to meet irregular production requirement
– Overtime premium charged to factory overhead

(5) Overtime worked as per general production program

or to meet seasonal demand.

→ Overhead premium charged to factory overhead.

Qno In a factory the basic wage rate is Rs. 20 per/hr and overtime rate as follows:-

Before and After normal working hrs — 175% of basic wage rate

Saturday and Holiday — 225% of basic wage rate

During previous year the following hours were worked.

Normal time	1,00,00 hrs
Over time before and after normal hrs	20,000 hrs
Over time on saturday and holiday	5,000 hrs
	1,25,000 hrs

The following hrs have been worked on job no 2.

Normal	1,000 hrs
Over time before/after normal hrs	100 hrs
Saturday and holiday	25 "
	1,125 hrs

Calculate labour cost chargable to job jet and overhead in each case.

(i) Overtime worked regularly as a policy due to labour shortage.

(ii) Overtime worked irregularly to meet production requirement.

(iii) Overtime worked at the request of customer.

(i) Overtime worked regularly throughout the year as a policy due to labour shortage.

Here,

Overtime premium is treated as part of labour cost and charged to job at an inflated wage rate.

Statement showing Inflated Wage rate

Part	Hrs	Rate	Amt
Normal wage	100,000	10	10,00,000
Overtime Yi			
Before and After N Hrs	20,000	17.5	350000
Saturday and Holiday	5,000	(175% of 10) 22.5	112500
		(225% of 10)	
Total	125000		1462500

∴ Inflated Wage Rate = $\frac{1462500}{125000}$

= Rs 11.7 / Hr

∴ Labour Cost chargable to job 2 = Total Hrs X Inflated Rate

= 1125 X 11.7

= Rs 13162.5 //

(ii) Overtime worked irregularly to meet production requirement

Here, overtime premium is charged to factory overhead

Labour cost chargeable to job 2 = Total Hrs X Basic Rate

Overtime Premium charged to OH

Part		Amt
Overtime Premium		
Before and After N Hrs	(100 X (17.5 X 10)	750
Saturday and Holiday	(25 (22.5 - 10)	312.5
	Total.	1062.5

(iii) Overtime worked at the request of customer.

Overtime premium is charged to job concerned.

A

Labour cost Chargable to job Z

P	Amt
Basic wage (1125 X 10)	11250
Overtime Premium	
Before and after N. Hrs [100X(17.5-10)]	750
Saturday and Holiday [25(22.5-10)]	312.5
Total	12312.5

Qno 33

(i) OH Absorption Rate = $\frac{\text{Total F.OH}}{\text{Total F. Wages}} \times 100\%$

$= \frac{36,0000+140000+125000}{80,000+350000+70000} \times 100\%$

= 125% of factory wages

Statement Showing S.P of Job No CW 7083

P	A
Direct Material (1200+600+300)	2100
" Wages (240+360+60)	660
Prime Cost	2760
Add :- Factory OH (125% of 660)	825
F. Cost	3585
Add :- Mark up @ 30%	1075.5
S.P	4660.5

(ii) Machine Dept

Here machine hour is dominant factor hence overhead is absorbed on the basis of machine hour.

- Budget
- Previous year vaneko absorption rate find गरेर लागि matra ho. अरु के मा use hundaina.

Overhead absorption rate = $\frac{\text{Total overhead of machining dept}}{\text{Total machine hr of machine dept}}$

$= \frac{3,60,000}{80,000}$

= 4.5 / machine hr.

Assemble garna ani pack garna labour are needed simple concept

Assembly and Packing Department

Here labour hr is dominant factor hence overhead is absorbed on the basis of labour hour.

Overhead absorption rate :-

Assembly Dept = $\frac{\text{Total Overhead of assembly dept}}{\text{Total hour}}$

$= \frac{1,40,000}{1,00,000}$ 10,050 0

= Rs 1.4 / labour hr.

Overhead absorption rate :-

Packing dept = $\frac{\text{Total overhead in packing dept}}{\text{Total labour hr}}$

$= \frac{125,000}{50,000}$

= Rs 2.5 / labour hr.

~~Add :- Factory OH~~

Statement Showing S.P of Job No CW 7083.

P	A
Direct Material	2100
" Wages	660
Prime Cost	2760
Add :- Factory OH	
Machine Dept (180 X 4.5)	810
Assembly Dept (120 X 1.4)	168

Packing Dept (40 × 2.5)	100
Factory cost	3838
Add:- Mark up @ 30%	1151.4
S.P	4989.4

Statement showing over/under absorption of OH (Current Policy)

Part	Machining	Assembly	Packing	Total
(a) Actual Direct Wages	96,000	270,000	90,000	
(b) Absorbed OH (125% of a)	120,000	337,500	112,500	570 000
(c) Actual OH	390000	84,000	135,000	609006
(d) Over/(under) absorption of OH (b-c)	(270,000)	253500	(22500)	(39,000)

Statement Showing over/under Absorbed OH (Recomended Policy)

Part	Machining	Assembly	Packing	Total
(a) Absorption Rate	4·5/MHr	1·4/2 Hr	2·5/2Hr	
(b) Actual Hrs (Mach)	96000	90,000	60,000	
(c) Absorbed OH (a×b)	432,000	126000	150,000	708,000
(d) Actual OH	390,000	84,000	135,000	609,000
(e) Over/(under) absorbed OH (c-d)	42,000	42,000	15,000	99,000

Q no 34

Product A = 50,000 = $\frac{300,000}{50,000}$ = 6 D

Product B = 1,00,000 = $\frac{100,000}{50,000}$ $\frac{300,000}{1,00,000}$ = 3D

Product C = 150,000 = $\frac{150,000}{}$ $\frac{300,000}{150,000}$ = 2 D

Product D = 3,00,000 = 1 D

Product

50,000 A = 3,00,000 D

A = $\frac{3,00,000}{50,000}$ D = 6 D

A = 270,000 × 162,000

B = 54000 D × 162000

C = 81000 D × 162000

Statement Showing Allocation of OH

Product	Prod^n Unit	Eq. Unit of D	Total Eq. Unit	OH
A	6750	6D	40500 D	243000
B	18,000	3D	54000 D	32400
C	40,500	2D	81000 D	48600
D	94,500	1D	94500 D	56700
			270,000 D	162000

Statement showing profit / loss

	Part	A	B	C	D
a →	S/P/unit	20	15	10	8
b →	Qty	6750	18,000	40,500	94,000
c →	Sales (a×b)	135,000	270,000	405000	756,000
(d)	Cost				
	Direct Material	50,000	92500	127 500	380000
	" Wages	15000	27500	37500	105,000
	Prime cost	65000	120,000	165,000	485000
Add:-	Factory OH (WN-1)	24300	32400	48600	56700
	Work cost	89300	152400	213600	541700
Add:-	S & D on @ 20%	17860	30480	42720	108340
	Total cost	107160	182880	256320	650040
	Profit / (Loss) (c-d)	27840	87120	148680	105960

Statement Showing Apportionment of OH

Q no 31 P.T.O

Production ko Direct cost ta Prime cost ma aaucha so it is ignored ani service ma matra allocate garchau hami

Q no 31

Statement Showing Apportionment of OH (Repeated Distribution Method)

Particulars	Amt	Basis	Ratio	Prodⁿ Dept PD1	Prodⁿ Dept PD2	Service Dept SD1	Service Dept SD2
Power generation point							
Fixed	37500	(121875 - 84,375) Normal Capacity	20:35:12.5:17.5	8824	15441	5515	7720
Variable	84375	Actual capacity	13:23:10.25:10	19500	34500	15375	15000
Total				28324	49941	20890	22720
Direct Material				–	–	10,000	20,000
" Wages				–	–	20,000	10,000
OH				80,000	50,000	30,000	20,000
Total				108324	99941	80890	72720
App of OH of SD1	50:40:10			40445	32356	(80890)	8089
App of OH of SD2	6:2:2			48485	16162	16162	(80809)
App of OH of SD1	5:4:1			8081	6465	(16162)	1616
App of OH of SD2	6:2:2			970	323	323	(1616)
App of OH of SD1	5:4:1			162	129	(323)	32
App of " " SD2	6:2:1			24	8	–	(32)
				(a) 206491	165384	–	–
Direct labour (Hr)				(b) 19000	12500		
				(95000/5)	(50,000/4)		
OH Recovery Rate /Hr (a/b)				Rs 10.87 Hr	Rs 13.43 Hr		

→ Based on direct wages rate

Qno37 (WN-1) Statement showing apportionment of Indirect S & D OH

Particular	Amt	Basis	Ratio	A	B
Insurance for inventory	78,000	Av Inv X Cost/Unit	(1000X300 : 800X600) 30:48	30,000	48,000
Storage cost	140,000	Avg Inventory X Space	(1000X2 : 800X1) 20:8	100000	40,000
Pad F chage	720,000	Sales unit	10:8	400,000	320,000
Salesman salary	850,000	equal effort	1:1	425,000	425,000
Invoicing cost	450,000	no of invoice	25:20	250,000	400,000
Commission		5% of sales (10,000 X 500) X 5%		250,000	400,000
Total Cost				145500	1433000

Statement showing profitability

Particulars	A	B
Sales	500	1000
less:- Cost / Unit	300	600
Gross Margin / Unit	200	400
Units	10,000	8,000
Gross Profit	2000000	3200000
less:- S & D Exp (WN-1) ~~5% on sales~~	1455000	1433000
Profit	545000	1767,000

(23) Soln:-

Statement showing cost sheet

P	A
Direct Mat	78
" Wages	30
Prime cost	108
Add OH	
Machine I	
4 hrs @ 4.5 — 18	
Add: Under absorbed OH (4 X 1.5) — 6	24

Machine B

6 Hrs @ 6.5	39	
Add:- Under absorbed OH (6 X 1.5)	9	48

Manual

20 Hrs @ 0.8	16	
Add:- Under absorbed OH (20 X 0.2)	4	20
Total cost		200

WN-I

Calculation of Supplementary Rate

Particulars	Manual	Machine I	Machine II
(a) Absorption Rate	0.8/Hr	4.5/Hr	6.5/Hr
(b) Actual Hrs	2400	30	32.5
(c) Absorbed OH (a×b)	1920	135	211.25
(d) Actual OH (Note)	2400	180	260
(e) (Over)/Under absorbed OH	480	45	48.75
(f) Supplementary Rate (e/b)	Rs 0.2/Hr	Rs 1.5/Hr	Rs 1.5/Hr

Where, Budged OH = Absorption Rate X Hours

Manual = 0.8 X 3000 = 2400

Machine I = 4.5 X 40 = 180

" II = 6.5 X 40 = 260

Note:- We've assumed actual OH and Budged OH to be same.

Qno17 Statement Showing OH Recovery Rate

Part	Amt (a)	Basis	No. of Activity (b)	Rate (a/b)
(a) Work OH				
Machine Shop	88200	Machine shop Hrs	12,000	Rs 7.35/Hr
Assembly Shop	51850	Assembly shop Hrs	10,000	Rs 5.18/Hr
(b) Adm OH	90,000	F. Cost	Rs 450000	Rs 0.2/Rupee of cost
(c) S and D OH	43100 (81000+62100)	Cost of Prodn	Rs 540,000	Rs 0.265/Rupee of cost of Prodn

(a) Statement Showing Cost of Job

P	A
Direct Mat (25 X 16.8 + 15 X 20)	720
" Wages	
Machine Shop (30 X 5.25 (WN-II)	157.5
Assembly Shop (42 X 4.8 (WN-I)	201.6
Prime Cost	1079.1
Add:- Work OH	
Machine Shop (7.35 X 30)	220.5
Assembly (5.18 X 42)	217.56
F. Cost	1517.16
Add:- Adm^n. OH (1517.16 X 0.2)	303.43
Cost of Prodn	1820.59
Add:- S & D OH (1820.59 X 0.265)	482.46
Total Cost	2303.05

WN-I Cost Sheet

Adm^n base of factory cost

S&D based on Cost of Prodn

P	A
Direct Material	199000
" Wages	111000
Prime cost	310000
Add:- FOH	140000
F. cost	450000
Add:- Admn expenses	90,000
Cost of Prodn	540000
Add:- Selling and D OH	143100
	683100

WN - II Calculation of hourly Rate of wages

Machine shop = $\frac{63000}{12000}$ = Rs 5.25 / Hr

Assembly shop = $\frac{48000}{10000}$ = Rs 4.8 / Hr

Machine hour rate :-

It is the expenses incurred on running a machine per hour.

Step to compute machine hour rate:-

(1) Calculate standing charge (Expense which doesnot change with change in machine hour) ~~per machine~~ for each machine cost centre.

(2) Calculate effective machine hour

(a) Total working days	xx
(b) Hours / day	xx
(c) Total Working hrs (axb)	xx
less:- Repair and Maintainence Hr	xx
Effective M. Hr	xx

(If set-up is productive)

Machine chaleko vaye pani na vaye pani lagne charges → Standing Charges
Machi ↳ Machine chalda lagcha nachalda pani lagcha.

less:- unproductive set-up hr	xx
Effective M. Hr	xx

(If set up Hr is unproductive).

(3) Calculate standing charge per machine hour = $\frac{\text{Step 1}}{\text{Step 2}}$

(4) Calculate running charge per machine hour for each activity.

(5) Calculate effective machine hour rate = Step 3 + Step 4.

Note:-

Life of machine in years = depn is standing charge

Life of machine in machine hour = depn is running charge.

Power → R

Lighting → S

Electricity — Lighning → S. ; Electricity — Lighting, power → Running, machine C

Lighting → Standing

Power → Running

Qno 1 Statement showing Machine Hr Rate

P	Amt	Rate
(a) Standing Charge		
Depn $\left(\frac{10,000-900}{10}\right)$	910	
Rent $(300 \times 12 \times \frac{1}{4})$	900	
Lighting $(80 \times 12 \times \frac{2}{10})$	192	
Foreman salary $(960 \times 12 \times \frac{1}{6})$	1920	
Insurance $(10,000 \times 1\%)$	100	
Total standing charge	4022	
Effective Machine Hr	4380	
Standing Charge / M Hr		0.918

Machine Hr Rate = Rate Hr × H. Used / Effective M/Hr → Effective Hour required

2592 / 2200

Same change direct

(b) Running Charges

Repair (18000/10)	1800	0.41
Electricity (15 × 0.05) = 3/60		0.75
Oil etc (9 × 12)	108	0.02
Running Charges / MHr		1.18

(c) Effective M. Hr Rate (a+b) Rate / Hr → 2.098.

Note:- Power = Rate / unit × Unit / Hr × Hour power is used

↓ Already working

Q no 2 Statement showing Machine Hr Rate

Part	Amt	Rate: Set up Productive	Rate: Set up unproductive
(a) Standing Charges			
Depn (70000 − 70,000)/12	100,000		
Operator wages (420 × 115% × 54 × 4)/8	13041		
Dept and General OH (50,000 × 110%)/8	6875		
Total standing Charges	119916		
Effective M·Hr (WN-I)			
= Set up Productive	2292 → Set up lai productive manyo vane		
= " " unProductive	2200 → Set up lai productive manna vane		
Standing Charges / Hrs		52.32	54.51
(b) Running Charges			
Maintainence	25000	10.91	11.36
Special Chemical Sol^n (400 × 54)	21600	9.42	9.82
Electricity (16 × 3 × 2200)	105600	46.07	48
Running Charges / MHr		66.4	69.18

(c) Machine Hr Rate (a+b) 118.72 123.69

Working note

WN-I Calculation of weeks

324/6 = 54 weeks.

WN-II Calⁿ of effective M Hr

Part	Set UP: Productive	Set UP: Unproductive
Working Hrs	2592	2592
less:- Maintaince Hrs	300	300
	2292	2292
less:- Unproductive Set up Hr	—	92
Effective M. Hr.	2292	2200

Q no 3 Statement showing Machine Hr Rate

Particulars	Amt	Rate
(a) Standing Charges		
Operator wages (650 × 3)	1950	
Depⁿ (180,000 × 12% × 3/12)	5400	
Supervisor Wages (1500 × 3/3)	1500	
Rent, Rates and tax	5000	
Total Standing Charge	13850	
Effective machine Hr (WN-1)	598	
Standing Charges / MHr		23.16
(b) Running Charge		
Repair and Maint (16000 × 3/12)	4000	6.69
Consumable Store (30,000 × 3/12)	7500	12.54
Power (2 × 3 × (48-2-2) × 13)	3432	5.74
.. Running charge / MHr		24.97

Comprehensive M·H Rate = M·Hr Rate + Operator wages

(c) Machine Hr Rate (a+b) 48.13

Statement showing S.P for Idle Capacity

Particular	Amount
Running Charges / Hr	24.097
Add:- Profit @ 20%	4.994
S.P / Hr	29.964

WN-1 Calculation of Effective M·Hr

Particular	Hrs
Hour / week	48
less:- Maintainance Hrs	2
Effective M·Hr / week	46
No of week	13
Total Effective M·Hr	598

Q no 6 Statement Showing Maching Hr Rate

Particulars	Amt	Rate
(a) Standing Charges		
Depn $(\frac{5001000-5000}{10})$	49500	
Insurance Premium $(\frac{4500}{75} \times 5)$	300	
Rent $(\frac{800\times12}{1600} \times 100)$	600	
Lightining $(120\times12\times\frac{3}{20})$	216	
Total Standing Charge	50616	
Machine Hr	4000	
Standing Charges / M Hr		12.65
(b) Running Charges		
Repair and Maint 2000		0.5
Electricity (25 X 0.75)		18.75
Running Charge / Mhr		19.75
(c) Machine Hr Rate (a+b)		

Q no 7 Statement showing Machine Hr Rate

Particulars	A	R
(a) Standing Charge		
Operator wages	17100	
Prodn Bonus @ 15%.	2565	
Supervision and Indirect labour	3300	
lighting and electricity	1200	
Insurance $(\frac{40000}{2})$	20,000	
Sundry Exp $(\frac{12000}{2})$	6000	
Depn $(8,00,000 \times 10\% \times \frac{6}{2})$	40,000	
General Mgmt Exp $(\frac{54530}{2})$	27265	
Total standing Charges	117430	
Effective Machine Hr [WN-1]	5760	
Standing Charge / M Hr		20.39
(b) Running Charge		
Power 8050		1.39
Rand M (3% of 8,00,000 12,000 $\times\frac{1}{2}$)		2.08
Running Charge / M Hr		3.47
(c) M·Hr Rate (a+b)		23.86

WN-1 Calculation of Machine Hr

P	Hrs
Normal Hrs / month	208
less:- Absenteism	18
leave Hrs	20
less:- Ideal Hrs	10
Hours spend in Machine / Month	160
No. of month	6

Total Hrs/Worker 960
No of operator 6
Total Hours 5760

Since Machine cannot be operated without an operator wholly engaged on it.
∴ Total Machine Hrs = 5760 Hrs.

WN-II Operator wages

Total hours worked = (08–18) X 6 months X 6 operators
= 6840 Hrs

Hourly Rate = $\frac{20}{8}$ = Rs 2.5/Hr

∴ Total Wages = 6840 X 2.5
= Rs 17100

Qno 9 Statement showing Machine Hr. Rate

Part	Amt	Rate Operation	Set-up
(a) Standing Charges			
Factory Rent ($\frac{96,000}{80,000}$ X 5000)	6000		
Heat and Gas ($\frac{45,000}{15}$)	3000		
Supervision ($\frac{120,000}{15}$)	8000		
Depn ($\frac{45,000-5000}{10}$)	4000		
Special equipment cost	3000		
Total Standing Charge	24,000		
Machine Hr (3600+400)	4000		
Standing Charge/M Hr	6	6	6
(b) Running Charge			
Operator Wages ($\frac{48}{8}$ = 6)		3 ie ($\frac{6}{2}$)	6
Power		2	—
∴ Running Charge/Hr		5	6
(c) Machine Hr Rate (a+b)		11	12

2 machine under operation

(11) Statement Showing Machine cost absorbed in work order

Part	Rate	Order No 31 Hrs	Amt	Order no 32 Hr	Amt
Set up cost	12	10	120	20	240
Operation cost	11	90	990	180	1980
Total			1110		2220

Qno 12 Calculation of Machine Hour Rate (without use of computer) (computer को खर्च नहीं जोड़ेंगे)

Particulars	Amt
Rent ($\frac{17500}{3}$)	5833.33
Depn ($\frac{2,00,000}{12}$)	16666.67
Indirect exp. ($\frac{150,000}{12}$)	12500
Total Machine cost	35,000
Machine Hr (600+400+900+600+1000)	3500
M Hr Rate	Rs 10

(b) Calculation of Machine Hr Rate (with use of computer) (computer को खर्च जोड़ेंगे)

Particulars	Amt
(i) Hire charge/Month ($\frac{4,20,000}{12}$)	35000
(ii) Hour computer is used (400+600+1000)	2000
(iii) Hire Charge/Hr ($\frac{I}{II}$)	17.5
Add :- M.Hr. Rate (Without use of computer)	10.0
M.Hr Rate (with use of II)	27.5 → Total Hr

(ii) Statement Showing M.Hr Rate for job

	P Rate	A Hr	Amt	B Hr	Amt	C Hr	Amt
Without use of computer	10	600	6000	900	9000	—	—
With use of computer	27.5	400	11000	600	16500	1000	27500
				1500	25500	1000	27500
		1000	17000 Rs 17/Hr		Rs 17/Hr (25500)		Rs 27.5/Hr (27500)

Date: / /

Qno 8 Statement showing Machine Hr. Rate

P		Large Machine (Lathe machine & Drilling machine) Amt	Large Machine Rate	Small Machine (Nickel Plating & Grinding machine) Amt	Small Machine Rate
(a)	Standing Charge				
	Rent (WN-I)	400		200	
	Lighting (WN-I)	97.5		65	
	Manager Salary ($\frac{4800}{12} \times 3 \times \frac{1}{6} \times \frac{1}{2}$)	100		100	
	Total standing Charge	597.5		365	
	Machine Hr ($\frac{1440}{12} \times 3$)	360		360	
	Standing Charge / M Hr		1.66		1.01
(b)	Running Charge				
	Depn ($\frac{20,000}{12000}$; $\frac{40,000}{12000}$; $\frac{4000-100}{9000}$)		1.33		0.43
	Repair ($\frac{4000}{12000}$; $\frac{1200}{9000}$)		0.33		0.13
	Power @ 0.05 (20 ; 2)		1.0		0.1
	Running Charge / M Hr		2.66		0.66
(c)	M. Hr Rate (a+b)		4.32		1.67

WN-I Rent

Part	Large	Small
(a) No of Machine	2	4
(b) Area / Machine	$\frac{1}{4}$	$\frac{1}{8}$ ($\frac{1}{4} \times \frac{1}{2}$)
(c) Total area (a x b)	$\frac{1}{2}$	$\frac{1}{2}$
(d) Rent Apportioned ($\frac{6400}{12} \times 3 = 1600$ @ 1:1)	800	800
Rent / Machine ($\frac{d}{a}$)	400	200

WN-II Lighting

Part	Large	Small
(a) No of machine	2	4
(b) worker / Machine	3	2
(c) Total Worker (a x b)	6	8
(d) Lighting Apportioned ($1820 \times \frac{3}{12} = 455$ @ 6:8)	195	260
(e) Lighting / Machine ($\frac{d}{a}$)	97.5	65

Date: / /

Qno 13 Statement showing two tor Machine Hr Rate

Part	Amt	(200) Rate Setup (Lonsida)	(180) Running
(a) Standing Charge			
Depn ($\frac{500000 - 20,000}{10 \times 12}$)	4000		
Rent ($72,000 \times \frac{1}{6} \times \frac{1}{12}$)	1000		
Supervisory salary ($6000 \times \frac{1}{3}$)	2000		
Operator wages	2500		
Lighting Charge	1000		
Total Standing Charge	10,500		
Machine Hr (208-8)	200		
Standing Charge / M Hr		52.5	52.5
(b) Running Charge			
R and M ($60480 \times \frac{1}{12}$)	5040	—	28
Consumable Store ($47520 \times \frac{1}{12}$)	3960	—	22
Power ($25 \times 2 \times 180$)	9000	—	50
Running Charge / M Hr	—	—	100
(c) Machine Rate (a+b)		52.5	152.5

WN-1

Hours power is used = 208 − 8 − 20
= 180 Hrs

Arjuna Running Hrs of Machine
= 208 − 8 − 20
= 180 Hr.

(14) Statement Showing Machine Hr Rate

Particulars	A	B
(a) Standing Charges		
Depn (324000 × 10% × 1/12)	2700	
Machine man wages (WN-1)	6737	
Helper Wages (")	4945	
Supervision	3000	
Electricity	7500	
Insurance (16250/12)	1354	
Other General Exp (27600/12)	2292	
Total Standing Charges	28528	
M. Hr (200 × 75%)	150	
Standing Charge / M/Hr		190.18
(b) Running Charges		
Power 15,000	100	
R & M 17500	116.67	
Running Charge / M/Hr	216.67	
(c) M. Hr Rate (a+b)	406.85	

W.N-1

(a) No of days for worker = 200/8 = 25 days.

(b) Statement Showing Wages

Part	Machine Hr	Helper
Basic wages	8125 (125 × 25)	1875 (75 × 25)
DA	1575	1575
	4700	3450
Add:- Prodn Bonus 1/3 × 4700	1567	1150
Leave wage and Holidays 10% of 4700	470	345
Total wage	6737	4945

Q.no 16

Statement showing cost of Running a Machine

P	Amount
(a) Standing Charge	
Depn (52,000 × 10% × 4/52)	400
Rent (5400 × 1/3 × 4/52)	138.46
Heat and light (9720 × 1/3 × 4/52)	249.23
Foreman salary (12960 × 1/3 × 4/52)	332.31
Operator wages ((48×4×20×3 operator)/3 shifts)	3840
Bonus [(48-4) × 4 × 20 × 3 operator × 10%]/3	352
Total Standing Charges	5312
(b) Running Charge	
Consumable store [75 × 4]	300
Power [20 × 0.8 × (48-4) × 4]	2816
R & M (60 × 4)	240
Total Running Charge	3356
(c) Total cost (a+b)	8668

Machine Hr Rate = Total cost / Effective M. Hr

= 8668 / (48-4) × 4

= Rs 49.25

Note:- If question is silent regarding set up-time, it is assumed to be unproductive.

Manual

Q no 6

Computation of Machine Hour Rate

Particulars	Basis	Total	Machines A	B	C
(1) Standing Charges					
Insurance	Depn (3:3:2)	8000	3000	3000	2000
Indirect labour	Direct labour (2:3:3)	24,000 (W.N.i)	6000	9000	9000
Building and maintenance	Floor space (2:2:1)	20,000	8000	8000	4000
Rent and Rates	"	170,000	48,000	49,000	41,000
Salary of Forman	Equal	240,000	80,000	80,000	80,000
Salary of attendant	Equal	60,000	20,000	20,000	20,000
Total standing charges (a)		472,000	165,000	168,000	139,000
Effective hours (b)			1948	1948	1948
Hourly rate for standby hrs (a÷b)			84.70	86.24	71.36
(B) Running Charges					
Depn	Direct	20,000	7500	7500	5000
Spare parts	Final estimates	10225	4600	5750	2875
Power	K.W rating (3:2:3)	40,000	15,000	10,000	15,000
Consumable Stores	Direct	8,000	3,000	2500	2500
Total Running expenses (a)		81,225	30,100	25,750	25,375.
Total effective hrs (b)		1948	1948	1948	1948
Machine hr Rate (a÷b)			100.15	99.46	84.38

(Working Notes:-

(i) Calculation of effective working hours:-

No of full off days = No of Sunday + No of holiday
= 52 + 12 = 64 days.

No of half working days = 52 days − 2 holiday = 50 days
No of full working days = 365 − 64 − 50 = 251 days
Total working hour = {(251 days × 8 hrs) + (50 × 4 hrs)}
= 2008 hours + 200 = 2208 hrs

Total effective hours = Total working hours × 90% − 2% of breakdown
= 2208 hrs × 90% − 2% (2208 × 90%)
= 1987.2 hrs − 39.74 hrs
= 1947.46 ≈ 1948 hrs.

(ii) Amount of spare parts:-

	A	B	C
Preliminary estimates	4000	4000	2000
Add:- Increase in price @15%	600	600	300
	4600	4600	2300
Add:- Increase in consumption @25%	—	1150	575
	4600	5750	2875

(iii) Amount of Indirect labour is calculated as under.

Preliminary estimates	20,000
Add:- Increase in wages @20%	4000
	24,000

(iv) Interest on capital outlay is a financial cost, therefore it has been excluded from the cost accounts (Purely financial expenses)

Date: / /

Q no 17

Let m & y be OH absorption rate for f·OH and S & Adm OH resp.

Then,

Statement Showing Cost

	Job No 1102	1108
Direct Material	37,500	54,000
Direct wages	30,000	42,000
Prime Cost	67,500	96,000
Add:- F·OH	67500 + 30,000m	96,000 + 42000m
Add:- S & Adm OH	(67,500 + 30,000m)y	(96,000 + 42,000m)y
Total Cost	67500 + 30,000m + 67500y + 30,000my	96,000 + 42,000m + 96,000y + 42,000my
Actual Cost	99375	141000
	(107325 / 108%)	(157920 / 112%)

Now,

For order No 1102

$67500 + 30,000m + 67500y + 30,000my = 99375$

$\therefore 30,000m + 67500y + 30,000my = 31875$ — (i)

For order No 1108

$96000 + 42000m + 96,000y + 42,000my = 141000$

$\therefore 42,000m + 96000y + 42000my = 45000$ — (ii)

Solving eqn (i) and (ii)

$30000m + 67500y + 30,000my = 31875$ } ×4.2

$42,000m + 96,000y + 42,000my = 45,000$ } ×3

$126,000m + 283500y + 126000my = 133875$

$126,000m + 288000y + 126000my = 135,000$

$-4500y = -1125$

$\therefore y = 0.25$

Date: / /

Putting value of 'y' in eqn (i)

$30,000m + 67500 \times 0.25 + 30,000 \times 0.25 = 31875$

Or, $37500m = 15,1000$

$\therefore m = 0.4$

$\therefore$ OH Absorption Rate for

Factory OH = 40% of Direct wages

S & Adm = 25% of F·Cost

(iii) Statement Showing SP of New Order

	P	A
Material		64000
wages		50,000
	Prime Cost	1,14,000
Add:- FOH (50,000 × 40%)		20,000
	F·Cost	134000
Add:- Selling Adm OH @ 25%		33500
	Total Cost	167500
Add:- Profit @ 20% of Sales		41875
Sales (167500 / 80%)		209375.

Q no 20 Statement Showing S·P/Unit

Part	3 Month	9 Month
	78 000	357000
Direct Material @15	1,170,000	52,65,000
" Wages (WN-II)	750,000	31,59,000
Prime Cost	1920,000	841241,000
Add:- Factory OH.		
Fixed	240000 (960000/12 × 3)	720000 (960,000/12 × 9)

Variable @ 8	6,24,000	2808,000
Semi-Variable OH (WN-II)	177500	645000
Total Cost	29,61,500	12597,000
Add:- Profit	470500 (BF1)	1092,000 (1562500 - 470500)
Sales	3432,000	1,3689,000
S.P unit	(78000 x 44)	Rs 39

WN-I Cal^n of Production Unit

1st 3 month = $\frac{520,000}{12} \times 3 \times 60\% = 78,000$

Next 9 month = $\frac{5,201000}{12} \times 9 \times 90\% = 35,000$

Total 4,29,000

WN-II Calculation of Direct Wages

Part	3 months	9 months
(a) Direct wages @ Rs 9 (78,000; 351,000)	7,02,000	31,59,000
(b) Minimum Wages	7,50,000 (25000 x 3)	2250,000 (250,000 x 9)
(c) Actual Wages (a or b whichever is higher)	7,50,000	31,59,000

WN-III Semi-Variable OH

Part	3 Month	9 month
Capacity	60%	90%
Semi Variable OH	177500	645000
	$\left(\frac{560000+150000}{12} \times 3\right)$	$\left(\frac{560,000+150,000}{12} \times 9\right)$

Note:-

If 'as a whole' is provided at the end of semi variable on line.

% Avg capacity utilization = $\frac{4,29,000}{520,000} \times 100\%$.

= 82.5%.

Semi-variable cost = 5,60,000 + 150000 + 150,000

= 8,60,000.

Capacity

Capacity of plant refers to it's ability to produce with the available present resources and facilities.

Types of capacity

(1) Maximum / Installed / Rated Capacity

It refers to maximum possible production capacity of a plant as indicated by it's manufacturer which can be achieved only under perfect condition. i.e no loss of operating time. Due to normal loss of operating time it can never be achieved in practice and become merely a theoritical capacity.

(2) Practical / Capacity

It refers to maximum possible production capacity of a plant less capacity lost due to normal reason like normal repair and maintainence, saturday, holiday, stock taking etc.

Date: / /

③ Normal capacity

It refers to long term average of capacity based on sales expectancy. It is expected to be utilized over a long period based on sales expectancy.

④ Actual capacity

It refers to capacity actually achieved during a given period.

Idle capacity

It refers to that part of practical capacity which cannot be utilized due to abnormal reason like lack of product demand, shortage of raw material e.t.c.

Idle capacity = Practical capacity − Actual capacity

Idle capacity cost = It refers to cost associated with idle capacity which couldn't be recovered due to underutilization of plant.

$$\text{Idle capacity cost} = \frac{\text{Total cost related to plant} \times \text{Idle capacity}}{\text{Practical capacity}}$$

Accounting treatment of idle capacity cost

① Idle capacity due to unavoidable reason
— Idle capacity cost are charged to capacity utilized by using supplementry overhead rate.

② Idle capacity due to abnormal reason
— Such charge cost are charged to costing P/L A/c

Date: / /

③ Idle capacity due to seasonal factor

Such cost are charged to cost of production by inflating overhead rate.

Qno: A manufacturing unit produces electronic circuit @ 6 piece an hour. The unit worked in single shift of 8 hrs during a six day week and remains closed for 18 days a year on account of holidays. Average idle hours per month is 20 for cleaning and maintainance of equipment against the average annual output of 12,000 piece during last 10 year the actual output achieve during the year was 10,500 piece. The fixed overhead for the year amounted to Rs 5,40,000. Calculate idle capacity cost on the basis of assumption that idle capacity are based on maximum capacity, practical capacity and normal capacity.

Statement showing Idle Capacity Cost

Capacity	Hrs (a)	Actual Capacity (b)	Idle Capacity (c = a − b)	Idle Capacity Cost ($\frac{5,40,000}{2071 23.28} \times c$)
Max^m Capacity	2920	1800	1120	~~336000~~
Practical Capacity	2120	11	320	~~96,000~~ 81509.43
Normal Capacity	2000	11	200	~~54~~,000

WN-N

(a) Max^m Capacity = Total No of days p.a × Hours/shift
= 365 × 8
= 2920 Hrs.

(b) Practical Capacity

Max^m Capacity	2920
less:- Normal loss of Capacity	
Saturday (52 X 8)	416
Holiday (18 X 8)	144
Idle Hr (20 X 8)/12	240
Total Hrs	2120

(c) Normal Capacity = $\frac{12000}{6}$ = 2000 Hrs

(d) Actual Capacity = $\frac{10800}{6}$ = 1800 Hrs

Profit to be transferred to P/L A/C on account of Incomplete contract

(i) If % completion of contract < 25% ⇒ No profit transferred

(ii) If % completion of contract ≥ 25% < 50% ⇒ $\frac{1}{3}$ x Notional Profit x Cash Received / Work certified

(iii) If % " " " ≥ 50% < 90% ⇒ $\frac{2}{3}$ x " x "

(iv) If % " " " ≥ 90%

(a) Estimated Profit x Work certified / Contract Price

(b) Estimated Profit x " x Cash Received / Work certified

or

" x Cash Received / Contract Price

(c) Estimated Profit x Cost to date / Total Estimated Cost

(d) " x " x Cash Received / Work certified

(e) Notional Profit x Work certified / Contract Price

(If data to compute estimated profit not provided)

Note

(i) % completion of contract = Work certified / Contract Price x 100 %

(ii) Cash basis = Cash Received / Work certified

(iii) Estimated Profit

Contract Price	XX
less:- Total Estimated Cost	
Cost to date	XX
Further Estimated cost	XX
Estimated profit	XX

(iv) In case of notional loss, it is transferred to P/L A/C

(v) In case of future loss, it is to be recognized today as per prudence concept as

P/L A/C Dr XXX

To Provision for loss XXX

(vi) Work uncertified is always shown at cost price

(vii) WIP = Work certified + Work uncertified

or

WIP = Cost to date + Notional Profit

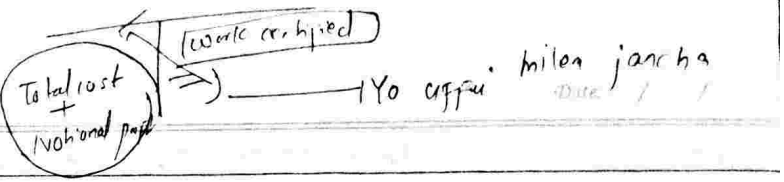
- Contract costing is related to construction business and is prepared on behalf of contractor.
- Contract ~~accounting~~ account is nominal nature account and only operating trasaction related to contract are considered. i.e non-operating, investing and financing nature transaction are not considered.
- Only depreciation related to assets used in contract are considered.
- Profit or loss on sale of fixed assets being investing nature trasaction are not considered.
- ~~Plant~~ Material returned to store, material destroyed by fire, material sold etc are credited to contract account at cost price to compute raw material consumed

Q no1

In the books of ---
Contract A1C
for the year ending 31st Dec. 1998

Particulars	Amt		Particulars	Amt
To material	170698		By WIP	
To labour	148750		Work certified	390,000
Add: Accrued	5380	154130	Work uncertified	9000
To direct expenses		6334		
To OH		8252	By Material returned	1098
To Depn (80,000-24,000)		8000	By material in hand	3756
To Notional Profit c/d		56450		
To P/L A1C		34738	By notional Profit b/d	56450
To reserve in WIP(BF)		21712		
		56450		56450

Work certified hikadne



Profit transfered to P/L A1C $= \frac{2}{3} \times NP \times \frac{CR}{WC}$

$= \frac{2}{3} \times 56450 \times \frac{3,60,000}{3,90,000}$

$= Rs\ 34738$

Q no 8 Statement Showing Profit (lakhs)

		Cost to date		Further Estimated cost		Total
	Part	% comp	Amt	% comp	Amt	
(a)	Fabrication					
	Material	70%	280	30%	120 ($\frac{280}{70} \times 30$)	400
	Labour	60%	100	40%	66.67 ($\frac{100}{60} \times 40$)	166.67
	OH	60%	60	40%	40 ($\frac{60}{60} \times 40$)	100
			440		226.67	666.67
(b)	Erection cost (Total)	40%	110	60%	165 ($\frac{110}{40} \times 60$)	275
(c)	Total cost (a+b)		550 (Cost to date)		391.67	941.67 (Total estimated cost)
(d)	Profit	Notional Profit	92.47 ($\frac{158.33}{941.67} \times 550$)		65.86 (BF_3)	158.33 (Estimate d Profit)
(e)	Total		642.47 (Work certified) (550+92.47)		457.53 (BF_5)	1100 (Contract price)

Saw

% Comp of contract $= \frac{WC}{CP} \times 100\%$

$= \frac{642.47}{1100} \times 100\%$

$= 58.41\%$

Since % Comp of contract $\geq 50\% < 90\%$

∴ Profit transfered to P/L A1C $= \frac{2}{3} \times NP \times \frac{CR}{WC}$

$= \frac{2}{3} \times 92.47 \times \frac{600}{642.67}$

$= 57.57$ lakh.

Q.no 10

In books of Brock Const ltd
Contract A/C
For the year ending 31st Oct 2004

Particulars	Amt	Particulars	Amt
To material	6,75,000	By WIP	
To labour - 450000		Work certified	20,00,000
Less:- Prepaid - 25000	425000	Work uncertified	75,000
To Expenses 2,00,000			
Add:- O/S 50,000	250000	By Mat at site	75,000
To Depn (WN1)	110417		
To notional profit c/d	689583		
To P/L A/C	148580	By notional profit b/d	689583
To reserve in WIP (B/F)	541003		
	689583		689583

WN - II Calcn of estimated profit

P	A
(a) Contract Price	39,37,500
(b) Total Estimated cost	
Cost to date (2000000 + 75000 - 689583)	1385417
Further estimated cost	
Material (75000 + 1237500 - 37500) — O/S, P, C/S	1275000
Labour	
Paid 562500	
Add:- Op Prepaid 25000	
Add:- Cl. O/S 2500	5,90,000
Expenses	
Paid 350000	
less:- Op O/S 50,000	
Add:- Cl. O/S 251000	3,25000

EPX ~~Work CP~~ X CR / ~~CP~~ CR

75,000 return garisakeko 3,00,000 baki cha ani tesma 1,00,000 depn lagisakyo

Depn (300000 - 100000) x 1/3 x 5/12) 27778

(3603193)

334305

CON-I Depn Calculation

37 5000

	75,000	300000 (BF)
Period	5 Month	1 year
Depn @ 1/3	10417	1,00,000
	(75000 x 1/3 x 5/12)	(300000 x 1/3)

Page 9.14 (on March 31, 2004) ma plant at site aaeko cha.

∴ Depn = Rs 110417

(c) Estimated Profit (a - b) 334305

∴ Profit tfed to P/L A/C = EPX CR/WC x WC/CP

= 334305 x 1750000 / 3937500

= Rs 148580

109.25

Q no 17

In the books of ---
Contract A/C
For the year ended--- ('000)

P	A	P	A
To opening balance — Hire of plant	110	By WIP	
Cost of work complete	300	Work certified	2200
Mat at site	10	Work uncertified	40
To material	610	By mat at site	20
To wages	580	By GCMD A/C	5 (shortage)
To other exp	90		
To GCMD A/C	3		
To general OH A/C	95		
(5% of 2200)	(15)		

To notional Profit c/d 467

To P/L A/c 446 By Notional Profit b/d 467

To reserve in WIP C/F 21

467 467

WN-I General contract Mat Discrepancy A/c (GCMD) 1000

P	A	P	A
To contract A/c	5	By Contract A/c [0.5% of 130 + 40 − 20 − (5)]	3
		By costing P/L A/c.	2
	5		5.

WN-II Cal^{n} of Estimated Profit ('000)

P	A
Contract Price	2500
less:- Total Estimated cost	
cost to date (2200+40−467)	1773
Further estimated cost	220
Estimated Profit	507

∴ Profit t/fed to P/L A/c = EP X WC/CP

= 507 X 2200/2500

= 446.16

= 446 ('000)

(ii) If Contract Price is revised to Rs 4000 ('000) & no estimation for cost to completion is made. Then,

% comp of contract = WC/CP X 100 %

= 2200/4000 X 100 % = 55 %.

Since % comp of Contract ≥ 50% < 90%.

∴ Profit t/fed to P/L A/c = 2/3 X NP X CR/WC

= 2/3 X 467 X 60% (CR = 60% of WC) ← assumption.

= 249.06

= 249 ('000)

Q no 1 Statement Showing Contract ('lakhs)

Part	723	726	729	731
(a) Contract Price	23.2	14.4	10.08	28.8
(b) Work certified	17.41 (4.65+12.76)	13.26	7.56	4.32
(c) % completion of contract (b/a x 100%)	75.04%	92.08%	75%	15%
(d) Cost to date				
Raw Mat Consumed				
O/S of Mat	0.75	—	—	—
Purchase	5.22	1.8	1.98	0.8
less:- C/s of Mat	0.45	0.2	0.08	0.05
	5.52	1.6	1.9	0.75
Direct Wages	2.32	4.32	3.9	2.16
OH	1.06	2.6	2.62	1.05
Depn	1.0	0.7	0.55	0.6
	(5 X 20%)	(3.5 X 20%)	(2.75 X 20%)	(3 X 20%)
	9.9	9.22	8.82	4.56

Opg WIP (WIP) Work certified + Work uncertified + Opg Reserve in WIP

(e) OP WIP				
Work certified	4.65	—	—	—
(f) work uncertified	0.84	0.24	0.14	0.18
(g) Opening Reserve in WIP	1.5	—	—	—
(b) Notional Profit/(loss) (b+f+g-e-d)	5.2	4.28	(1.27)	(0.06)
(j) Profit/Loss tld to P/L Reserve in WIP	2.6	1.8	(2.52)	(0.06)
(k) Reserve in WIP for loss	2.6	2.48	—	—
(ii) Provision for loss	—	—	1.25	—

WN-I Contract No 723 (75.04%)

Since % completion of Contract ≥ 50% < 90%

∴ Profit tlfed to P/L A/C = 2/3 × NP × CR/WC

= 2/3 × 5.2 × 9.57 (during Year) / 19.76

= 2.6

WN-II Cost of estimated Profit / (loss) ('lakhs)

Part	726	729
Contract Price	14.4	10.08
less: Total Estimated Cost	11.52	12.6
Estimated Profit / (loss)	2.88	(2.52)

Contract No 726 (92.08%)

Profit / transpored to P/L A/C = EP × CR/CP

= 2.88 × 9/14.4

= 1.8

Contract No 729

Here total estimated loss is Rs 2.52 lakhs, out of which current year loss is Rs 1.27 lakhs and future loss in Rs 1.25 lakhs (2.52 - 1.27) for which provision is to be made as per prudence concept as

P/L A/C Dr 1.25

To provision for loss A/C 1.25

Q no 18

Shoes A/C

P		A	P	A
To Bank A/C	18,000		By Bank A/C	3625
To P/L A/C (3625 - 3000)	625		By Contract A/C (B/F)	14150
			By balance c/d	850

Plant A/C (Plant से जितना consume हुआ वह Dept में)

P	A	P	A
To Bank A/C	5000	By Bank A/C	575
		By Contract A/C (Dept) (B/F)	2875
		By bal c/d	1550

In the books of M/s Berg Co.

Contract A/C

for the year ending 31st March 1998

To Mat consumed	14150	By WIP	
To Depn	2875	Work certified (35000/80%)	43750
To wages	16250	" "	5475
To Sundry Exp	1325		
To Est Charge	2925		
To Notional Profit c/d	11700		
To P/L A/C	5993	By nominal Profit b/d	11700
To Reserve in WIP (B/F)	5707		
	11700		11700

∴ Profit tfred to PIL A/C = EP × WC / CP

= 13698 × 43750 / 100,000

= Rs 5993.

WN → Calc^n of Estimated Profess

		P	A
(a)	Contract Price		1,00,000
(b)	Total Estimated Cost		
	Cost to date (43750 + 5475 − 11700)		37525
	Further estimated cost		
	Wages	17875	
	Shre (850 + 17150)	18000	
	Sundy Exp	1500	
	Dep^n (1550 + 6400 − 750)	7050	
	Est Charge ($\frac{2925}{12}$ × 9)	2194	46619
			84144
Add:-	Contingency Exp @ 2.5%		2158
	Total Estimated cost of the contract		86302 → Total cost
	($\frac{84144}{97.5\%}$) Cost of the comp		
(c)	Estimated Profit (a−b)	13698	40 hundred

Qno 20

In the books of Powel Ltd

Contract A/C

for the year ended 30th June 1997

P	A	P	A
To material	1,00,000	By WIP	
To wages 45,000		Work certified →	2,00,000
5000	50000	Work uncertified	15000
To general exp	10000	By material on hand	25000
To Dep^n	5000	By esclaimation claim (WN-1)	5000
To Notional Profit c/d	80000		
To PIL A/C	20000	By notional profit b/d	80,000
To reserve in WIP	60,000		
	80,000		80,000

WN-1

Calculation of Esclation Clause

Part	Amt (a)	Original Cost (b)	CC = a−b	Increase by 5%	Increase by 5%
			Increment	d = 5% of b	(c−d)
Mat	75,000 (1,00,000 − 25,000)	60,000 ($\frac{75000}{125\%}$)	15,000	3000	12,000
Wages	50,000	40,000 ($\frac{50000}{125\%}$)	10,000	2000	8000
					20,000

∴ Esclation Claim = 25% of 20,000 = Rs 5000

OR

Material = $\frac{75000}{125\%}$ (25 − 5)% = 12000

Wages = $\frac{50,000}{125\%}$ (25 − 5)% = 8000

20,000

∴ Esclation Claim = 25% of 20,000 = Rs 5000

% Comp of Contract = $\frac{WC}{CP} \times 100\% = \frac{2,00,000}{5,00,000} \times 100\% = 40\%$

Since % Comp of contract ≥ 25% & < 50%

∴ Profit tfred to PIL A/C = $\frac{1}{2} \times NP \times \frac{CR}{WC}$

$= \frac{1}{3} \times \frac{80,000 \times 1,50,000}{2,00,000}$

$=$ Rs 20,000.

Q no 22 Statement Showing Contract

Particulars	V 20	V 24	V 25
(a) Contract	8.00	5.60	16.00
(b) Work certified	~~6.40~~ 7.20	~~4.00~~ 4.2	2.40
(c) % comp of contract ($\frac{b}{a} \times 100$%)	90%	75%	15%
(d) Cost to date			
Wages	2.4	2.0	1.2
Mat	1.0	1.1	0.44
OH	1.44	1.46	0.58
Depn (WN-1)	0.72	0.42	0.24
Total	5.56	4.98	2.46
(e) Notional Profit / (loss) (c-d)	1.64	(0.78)	(0.06)
(f) Prft / (loss) t/fred to P/L A/c	1.0	(1.4)	(0.06)
(g) Reserve in WIP	0.64	—	—
(h) Provision for loss	—	0.62	—

WN-II Calculation of Estimated Profit / (loss) (₹ lakhs)

Part	V 20	V 24	V 25
Contract Price	8.0	5.6	16.00
less:- Estimated cost	6.4	7.0	12.00
Estimated Profit / (loss)	1.6	(1.4)	4

(Contract No V 20 (90%))

Profit to be transferred to P/L A/c $= EP \times \frac{CR}{CP}$

$= 1.6 \times \frac{5.0}{8.0}$

$= 1.0$

WN-II Contract No V 24

Here total estimated loss is Rs 1.4 lakhs, out of which current year loss is Rs 0.78 lakhs and future loss is Rs 0.62 (1.4 − 0.78) lakhs for which provision is to be made as per prudence concept as

P/L A/c Dr 0.62

To Prov for loss 0.62

WN-I Cal^n of Depn

P & E	4,90,000
Vehicle	2,00,000
Depn @ 20%.	6,90,000
	1,38,000
	= 1.38 lakhs

	V 20	V 24	V 25
Ratio	7.2	4.2	2.4
Depn.	0.72	0.42	0.24

Statement Showing WIP Presentation in WIP (₹ lakhs)

	V 20	V 24	V 25	Total
work certified	7.2	4.2	2.4	13.8
less:- Reserve in WIP	0.64	—	—	0.64
Cash received	5.0	3.2	2.0	10.2
Provision for loss	—	0.62	—	0.62
WIP	1.56	0.38	0.4	2.34

WIP Presentation in Balance Sheet

		A
	Work Certified	xxx
	Work Uncertified	xxx
		xxx
less:-	Reserve in WIP	xx
less:-	Contractee AIC / Cash Received	xx
less:-	Any Works Provision related to contract	xx
	WIP	xx

Note:- Contractee AIC represents cash received from contractee

Eg:- Contract Price = 1,00,000

Cash Received

1st year 20,000
2nd year 40,000
3rd year 40,000

Prepare Contractee AIC

1st year

Cash AIC Dr 20,000
To Contractee AIC 20,000
(In form of Advance)

Contractee AIC			
To bal c/d	20,000	By Cash	20,000

B/S	
Contractee	20,000

2nd year

Cash AIC Dr 40,000
To Contractee AIC 40,000

Contrait AIC			
To bal c/d	60,000	By bal b/d	20,000
		By Cash	40,000

B/S	
Contractee	60,000

3rd year

Contractee AIC 1,00,000
To Contract 1,00,000
(Sales Entry)
Cash AIC Dr 40000
To Contract AIC 40,000
(Settlement Entry)

Contractee AIC			
To Contract	1,00,000	By bal b/d	60,000
		By Cash	40,000

(19) Statement showing escalation claim

Part	Standard Qty/Hrs (a)	Standard Rate (b)	Standard Amt (a×b)	Actual Rate (c)	Diff in Rate (d = c-b)	Amt (a×d)
I. Material						
A	500	50	25,000	45	(5)	(2500)
B	1000	30	30,000	35	5	5000
C	20	1000	20,000	1010	10	200
Total			75,000			2700
II Labour						
X	4800	2	9600	2.25	0.25	1200
Y	2400	1	2400	1.5	0.5	1200
Z	9600	1.5	14400	1.5	—	—
			26400			2400
Total (I + II)			101400			5100

∴ Final / Price Payable = Contract Price + Escalation Claim
= 101400 + 5100
= Rs. 1,06,500.

Q no 24

For the books of ---
Contract AIC
For the year ending 31st Dec 1990

(... लाई मालिकको दि ... सकेको काम कति certified भयो कति भएन |)

(10) 6n

P	A	P	A
To material	258,100	By WIP	
To labour	5,60,500	Work certified (2000000×50%)	10,00,000
To foreman's salary	79,300		
To Depn $\left(\frac{260000-15000}{7} \times \frac{146}{365}\right)$	14000	Work uncertified (W-N -1)	262254
To Supervisor Salary $(4000 \times \frac{3}{4} \times 9)$	27,000	By Mat at site	25400
		By Mat sold	4500
To Admn Exp	140000		
To notional Profit c/d	213254		
To P/L A/C	106627	By notional profit	213254
To reserve in WIP (B.F)	106627		
	213254		213254

Contract A/C

P	A	P	A
To balance c/d	750,000	By bank A/C	7,50,000

Extract of B/S

As on 31st Dec 1990

P		A	P	A
P & L A/C			Plant 260,000	
Profit from contract	106627		Less:- Depn 14000	
Add:- Profit on sale of plant	1000	107127	Less:- Plant sold 5500	240500
Less:- loss on sale of Mat (4500 − 4000)	500		WIP	
			Work certified 10,00,000	
			" uncertified 262254	
			12 62254	
			Less:- Reserve in WIP 106627	
			Cash Received 750000	405627

Mat at site ...

66.67 complet गर्दा 1049000 Rs lagyo haina

so $\frac{1049000}{66.67}$ गर्दाको × 16.67% गर्दाको ho vane कति?

WN-1

Work uncertified

Work Completed 66.667%

→ 50% Work certified

→ 16.667% (BF) Work uncertified

∴ Cost to date = 258100 + 560500 + 79300 + 14000 + 27000 + 140000 − 25400 − 4500

= Rs 1049000

∴ Work uncertified = $\frac{1049000}{66.667} \times 16.667$

= 262254

WN-II

$\% \text{ comp of Contract} = \frac{WC}{CP} \times 100\%$

$= \frac{10,00,000}{20,00,000} \times 100\%$

$= 50\%$

Since % comp. of contract ≥ 50% < 90%.

∴ Profit t/fed to P/C A/C $= \frac{2}{3} \times NP \times \frac{CR}{WC}$

$= \frac{2}{3} \times \frac{213254 \times 750000}{10,00,000}$

= Rs 106627 #

$\frac{2}{3}$ of the contract is completed i.e $\frac{2}{3} \times 100\% = 66.66\%$

→ 50% cert.

→ 16.66 un.

Q no 31 AKP Builders Ltd

Contract A/c 2005-2006

Particulars	Amt	Particulars	Amt
To material	90,000	By WIP	
To labour - 75,000		Work certified 175000 @ 8	218750
Add Outstanding - 6250	81250	Uncertified	27375
To expenses 7250		By sold material	15000
less: Prepaid 625	6625	By material at site	4250
To establishment charges	14625		
To dep^n	14375		
To notional profit	58500		
	265375		265375
To reserve in WIP	28539.45	By notional profit	58500
To profit and loss A/c	29960.55		
	58500		58500

W.N-1 Calculation of estimated Profit

		₹
(a)	Contract Price	5,00,000
(b)	Total estimated cost	187625
	Cost to date	
	Further estimated cost	
	• Material (15000 + 85750)	90,000
	• Labour (87325 + 8300 - 6250)	89375
	• Sundry expenses (5875 + 625)	7500
	• Establishment charges	10968.75
	• Reserve for contingencies	10800
	• Dep^n	35250
		431518.75
(c)	Estimated profit	68481.25

Now

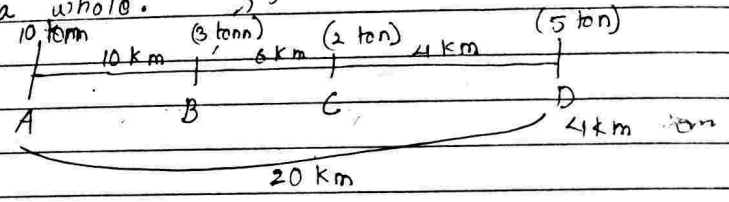
profit to be transferred = 68487.25 × 218750 / 500000

= 29960.75

Operating Costing

Absolute tonn-kilometre and Commercial tonn-km

In absolute tonn-kilometre the travel between any two station is considered individually whereas in commercial tonn-kilometre the trip is considerded as a whole.



Absolute ton-km
$= 10 \times 10 + 7 \times 6 + 5 \times 4 + 4 \times 20$
$= 242$ ton-km

Commercial ton-km = Avg load x distance
$= \left(\frac{10+7+5+4}{4}\right) \times (10+6+4+20)$
$= 260$ ton-km.

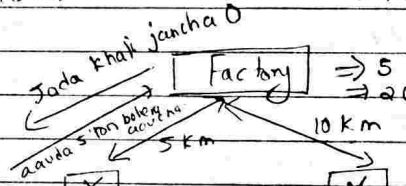
Qno1 Statement showing cost / ton-km

Particulars	X	Y
Fixed cost @ Rs 6/Hr	7	9
	$(\frac{6}{60} \times 70)$	$(\frac{6}{60} \times 90)$
Variable cost @ Rs 0.6/km	6	12
	(0.6×10)	(0.6×20)
Total cost (a)	13	21
Ton-km (b)	25	50
	$[0 \times 5 + 5 \times 5]$	$[0 \times 10 + 5 \times 10]$
cost / ton-km (a/b)	Rs 0.52	Rs 0.42.

Avg speed is 20 kms/per hour → Travel time to 10 Kms $= \frac{60}{20} \times 10$ Kms ... $\times 20$

WN-1 Calⁿ of Time required per run

Part	X	Y
Loading time	30 min	20 min
Unloading time	10 min	10 min
Travel time	30 min	60 min
	$(\frac{60}{20} \times 10)$	$(\frac{60}{20} \times 20)$
Total	70 Min	90 Min



	X	Y
Unload	10 min	10 min
Load	30 min	20 min
Travel time	30 min	60 min
	[20 km = 60 min, 10 km = 30 min]	[20 km = 60 min, " = "]

20 km — Jana 10 / aavda 10 = 20 km

Jada 5 / aavda 5 / 10 km

Decision:- The coal should be purchased from colliery X as it results into lower cost i.e Rs 13 with lesser distance.

Qno 2 Statement showing Operating cost

P	A
Standing Charges	
Depⁿ $(\frac{100000}{5})$	20,000
Insurance (1,00,000 x 3%)	3000
Road tax	2000
Garage rent (400 x 12)	4800
Driver salary (600 x 12)	7200
Conductor " (200 x 12)	2400
Manager " (1400 x 12)	16800

Stationery (100 x 12)	1200
Total Standing Charges	57400

(b) ~~Prime~~ Running Charge

Repair	2360
Petrol lost $\left(\frac{50}{100} \times \underset{WN-1}{36000}\right)$	18000
Total Running Charges	20360

(c) Total lost (a+b)	77760
Add:- Commission @ 10%	10368
Profit @ 15%	15552
Total taking $\left(\frac{77760}{75\%}\right)$ (i)	103680
Passanger km (ii) (40 x 36000)	1440000
Fare / Passanger-km $(\frac{i}{ii})$	Rs 0.072

First date out this

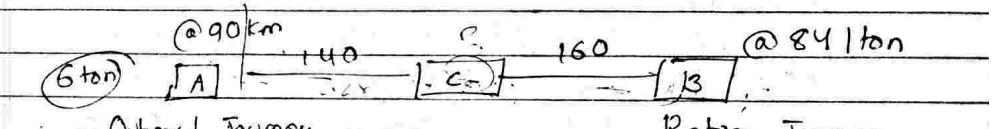
WN-1 Cal^n of Distance travelled
= (20 x 2) x 3 trip x 25 day x 12 month
= 36,000 km

Q no 11 Statement showing cost / ton km

P	A
Fixed cost $\left(\frac{60000}{12}\right)$	5000
Maintainence cost $\left(\frac{12000}{12}\right)$	1000
Running charge	2944
Total cost (a)	8944
Ton - km (b)	44720
cost / ton km (a/b)	Rs 0.2

(11) Statement showing profit

P	A
Revenue	
Outward Revenue (6 x 90 x 12)	6480
Return Revenue [(8 x 84 x 5) + (6 x 84 x 7)]	6888
Total Revenue	13368
less:- Operating cost	8944
Operating profit	4424
less:- Fine	1200
Net profit	3224



Outward Journey
City A → B ⇒ 10 times @ 6 ton
City A → C ⇒ 2 times @ 6 ton
C → B ⇒ 2 times @ 4 ton

Return Journey
City B → A ⇒ 5 times @ 8 ton
B → A ⇒ 6 times @ 6 ton
B → C ⇒ 1 time @ 6 ton

WN-1 Cal^n of ton-km

(a) Outward Journey
City A to City B = (6 x 300) x 10 = 18000
" A to " C = (6 x 140) x 2 = 1680
" C to " B = (4 x 160) x 2 = 1280

(b) Return Journey
City B to City A = (8 x 300) x 5 + (6 x 300) x 6 = 22800
" B to " C = (6 x 160) x 1 = 960
Total ton-km = 23760
Total ton-km (a+b) = 44720

Q no 13 Statement showing Annual Operating Cost

Particulars	Amt
(a) Standing Charge	
Driver Salary (2000×12×3)	72,000
license and tax (5000×3)	15,000
Insurance	5,000
Depⁿ $\left(\frac{3000000-100000}{10}\times 3\right)$	87,000
General OH	11084
Total Standing Charges	190084
(b) Running Charge	
Diesel cost $\left(\frac{10}{4}\times 134784 \text{ (WN-I)}\right)$	336960
Oil and sundries $\left(\frac{25}{100}\times 134784\right)$	33696
Maintenance cost (WN-II)	39696
Total Running Charge	410352
(c) Total Cost (a+b)	600436

WN-II Maintenance Cost

$$\text{V. Cost/Km} = \frac{\text{Diff in cost}}{\text{Diff in distance}} = \frac{46050-45175}{160200-156700}$$

= Rs 0.25/km.

At 160200 km

Total cost = Variable cost + Fixed cost

or, 46050 = (160200 × 0.25) + Fixed cost

Fixed cost = 6,000

At 134784 Km

Total cost = V. cost + Fixed cost

= (0.25 × 134784) + 6000

(ii) Cost/Km = $\frac{600436}{134784}$ = Rs 4.45/km

(iii) Total cost 600436

Add :- Profit @ 10% 66715

Freight $\left(\frac{600436}{90\%}\right)$ 667151

Ton-km (WN-I) 525312

Freight/ton-km Rs 1.27

WN-I Cal^n of Distance and ton-km

Truck	One way distance Trip (a)	day	Distance (c = a×2×b×24×12)	Load/trip (d)	Ton-km ($\frac{c}{2}\times d$)
1	16	4	36864	6	110592
2	40	2	46080	9	207360
3	30	3	51840	8	207360
			134784		525312

WN-II Cal^n of Diesel cost

(a) 1 Hr = Rs 10

(b) 1 Hr = 4 km

⇒ 4 km = Rs 10

1 km = $\frac{10}{4}$

134784 km = $\frac{10}{4}\times 134784$

= 336960.

Q no 14 Statement showing operating cost of bus

	Single bus	25 bus
(a) Standing Charge		
Driver Salary	60,000 (5000 X12)	1500000
Cleaner "	7200 (3000X12/5)	180000
Licence fee and tax	2300	57500
Insurance premium	15600	390000
Dep^n	93750 (1650000-150000/16)	2343750
Total Standing Charge	178850	4471250
(b) Running Charge		
R & M	16400	410000
Diesel cost	56832 (18.5/10 X 30720)	1420800
Total Running cost	73232	1830800
(c) Total cost (a+b)	252082	6302050

WN-1 Calculation of Distance
= (16X2) X4 trip X 24 X 10 month
= 30720 km

(b) Running Charges
R & M

(11) Avg cost / month / bus = 252082/12 = Rs 21006.8

Avg cost / Eq. Full fare paying student / month = 210668/86.5
= Rs 237.36

∴ Avg cost / student per month
within a distance of 4km = 237.36 X 25% = 59.34
Between 4 to 8 km = 237.36 X 50% = 118.68
8 to 16 km = Rs 237.36

WN-II Statement showing equivalent full fare paying student

Distance	No of students (a)	Weight	Eq. students
Within 4 km	18 (15% of 120)	25%	4.5
4 - 8 km	36 (30% of 120)	50%	18
8 -16 km	66 (55% of 120)	100%	66
	120.		88.5

where,
No of students = 60 X 2 = 120
(Senior + Junior)

Q no 18 Statement showing cost / ton-km

		A
(a) Standing charges		
Superintendent salary	(1800 X 50%)	900
Foreman salary	(600 X 4)	2400
Driver wages	(200 X 100)	20,000
Labour wages	(300 X 80)	24,000
Consumable stores		20,000
Garage Rent		2500
Gas and Electric Charges		800
Misc. Exp		15,000
Total Standing Charges		85600

(b) Running Charges

Petrol cost	80,000
Lubricant	10,000
Replacement of tyre and tube	6,000
Service Charge of workshop	15,000
Total	111000

(c) Total cost (a+b)	196600
(d) Tonn-km (WN-1)	182250
(e) Cost / Ton-km ($\frac{c}{d}$)	Rs 1.08

WN-1 Caln of Ton-km

No of Vehicle (a)	Distance (b) (a×90%×6×5×30)	Ton (c)	Tonn-km (c×50%×b)
30	24300	5	60750
40	32400	3	48600
50	40500	2	40500
20	16200	4	32400
			182250

Ans 2 Statement showing fare / Passanger-km.

WN-1 Caln of passanger km.

City	One day distance (a)	Days/month (b)	Distance (c=a×2×b)	Passanger (d)	Passanger km (c×d)
Delhi to Chandigarh	150	8	2400	45 (50×90%)	108000
Delhi to Agra	120	10	2400	42.5 (50×85%)	102000
Delhi to Jaipur	270	6	3240	50 (50×100%)	162000
			8040		372000

Statement showing fare / Passanger-km

P A

(a) Standing Charge

Dep^n ($\frac{600000 \times 20\%}{12}$)	10,000
Driver Salary	2800
Conductor Salary	2200
Part time Accountant	200
Insurance ($\frac{4800}{12}$)	400
Road tax ($\frac{1500}{12}$)	125
Permit fee	315
Total Standing Charge	16040

(b) Running Charge

Lubricant Oil	($\frac{10}{100}$ × 8040)	804
Diesel	($\frac{6}{4}$ × 8040)	12060
Repair		1000
Total Running Charge		13864

(c) Total cost (a+b)			29904
Add:- Passanger tax @ 20%			11962
Profit @ 30%			17942
Total taking	($\frac{59808}{50\%}$)	(i)	59808
Passange-km	(WN-1)	(ii)	372000
Fare / Passanger-km		(i/ii)	Rs 0.1607

One way fare / Passanger from

Delhi to Chandigarh = 0.1607 × 150 = Rs 24.1

" to Agraa = 0.1607 × 120 = Rs 19.28

" " Jaipur = 0.1607 × 270 = Rs 43.39

Q no 27 Total Room day = 32 × 365
= 11680

At 50% Occupancy = 11680 × 50%
= 5840

Calculation of Tariff / Room day (At 50%)

P	A
Fixed cost	426320
Variable cost	
Occupied cost (15 × 5840)	87600
Unoccupied Cost (2 × 5840)	11680
Total cost	525600
Room / day (50%)	5840
Tariff / Room day	Rs 90.

Unoccupied (11680 − 5840) = 5840 ✓

[At BEP
Total Revenue = Total cost]

(ii) Statement Showing Profit

P	60%	70%	80%
(a) Occupied Room	7008	8176	9344
(b) Unoccupied Room	4672 (11680 × 40%)	3504	2336
(c) Fixed cost	426320	426320	426320
(d) Variable cost			
Occupied cost (15 × a)	105120	122640	140160
Unoccupied cost (2 × b)	9344	7008	4672
(e) Total cost (c+d)	540784	555968	571152
(f) Revenue (90 × a)	630720	735840	840960
(g) Profit (f − e)	89936	179872	269808

Profit / Tariff / Room day

(iii) Statement showing profit (At 100% occupancy)

P	A
(a) Revenue (11680 × 90 × 90%)	946080
(b) Cost	
Fixed cost	426320
V. Cost	
Occupied cost (11680 × 15)	175200
Unoccupied cost (0 × 2)	—
Total cost	601520
(c) Profit (a − b)	344560

Q no 28 Statement Showing Rate

P	A
(a) Standing Charges	
Manager's salary (800 × 1 × 12)	9600
Gate keeper " (200 × 10 × 12)	24000
Operators " (400 × 2 × 12)	9600
Clerks " (250 × 4 × 12)	4000
Misc Exp	5425
Admn Exp	18,000
Depn	
- Premises (600,000 / 15)	40,000
- Equipment (320 000 × 10%)	32,000
Total Standing Charges	150625
(b) Running Charge	
Electricity and Oil	11655
Carbon	7235
Advertisement	34710
Hire of plant	140700
Total Running Charge	194300

29/11/10

	Total Running Charge	194300
(c)	Total cost (a+b)	344925
(d)	No of Seat Show (WN-1)	985500
(e)	Cost / Seat Show (c/d)	Rs 0.35
	Add:- Profit @ 30%	0.15
	Rate / Seat Show ($\frac{0.35}{70\%}$)	0.5

∴ Rate / Seat Show for
Janata Circle = 0.5
Sanman " = 0.5 x 2 = Rs. 1.0
Lord's " = 0.5 x 3 = Rs 1.6

WN-1 Cal^n of ~~equipment~~ equivalent no of Seat show

Part	No of seat	wt	Eq. Janata Seat
Janata Circle	250	1	250
Sanman "	250	2	500
Lord's "	125	3	375
		Total equivalent Janata Seat	1125
		No of show / day	3
		Equivalent Seat show / day	3375
		No of days p.a	365
		Total eq. seat show p.a	1231875
		less:- Vacant seat @20%	246375
		Total seat show	985500

Q no 23 Statement showing net operating income.

		P	A
(a)	No of passanger (160 x 60%)		96
(b)	Revenue (7200 x 96)		691200
(c)	Variable cost		
	Fuel		96000
	Food served (125 x 96)		12000
	Commission (5% of 691200)		34560
	Total V-cost		142560
(d)	Cot^n (b-c)		548640
	less:- Fixed cost		
	Aircraft lease	350,000	
	Landing charge	72,000	422,000
	Operating Profit		126640

(ii) Statement showing incremental profit / contribution

	P	A
Revenue (6720 x 108)		725760
less:- Variable cost		
Fuel cost	→ 96,000	
Food served (125 x 108)	→ 13500	
Commission	→ 36288	145788
Revised contribution		579972
less:- Existing contribution		548640
Increased contribution		31332

Decision:- The proposal should be accepted as it results into incremental profit of Rs 31332.

Integrated and Non Integrated Accounting System

Non-Integrated Accounting System

It is a system of accounting under which two separate set of account books is maintained - one to record cost trasaction and the other to record finacial atrasactions.

Features

- There are two sets of books of account.
- There are two figure of profit or loss ie financial profit and costing profit.
- There is need for reconsiliation as there are two figure of profit or loss.
- ~~for~~ All control accounts are maintained in cost ledger.
- Cost ledger control account is prepared to make double entry.
- Cost accounts are concerned with impersonal account ie Real and nominal account.
- Under this system one main ledger and various subsidiary ledger are maintained.

Ledgers in cost-book

(1) Cost ledger
It is the main / principle ledger in cost book which contains

(i) A control account for each of the subsidiary ledger like store ledge control account, WIP control account, finished good ledger control Account e.t.c.

(ii) A cost ledger control account / general ledger adjustment Account / Nominal ledger control account to make cost ledger self balancing.

(2) Store ledger
It deals with material transaction It contains separate account for each item of store. The balance of this account represents cost of unconsumed store.

(3) WIP ledger
It deals with WIP. It contains separate account for each job / WIP. The balance of this account represents cost of unfinished work

(4) Finish goods ledger
It deals with finished goods. It contains separate account for each item of finished goods. The balance of this account represents the cost of unsold finished goods.

Control Account

Control Accounts are total / summary accounts which are:

(1) Maintained for subsidiary ledger in cost ledger under non-integral system.

(11) Prepared on the basis of periodic total of trasactions in respective subsidiary ledger.

The balance of control account represents total of balances in various individual account in respective subsidiary ledger.

Control accounts are mainted in cost ledger to complete double entry.

Advantage of Control Account

(i) It provides a summary of trasactions recorded in various subsidiary ledger.
(ii) It facilitates prompt preparation of financial statement at the end of each accounting period.
(iii) It provides a basis for reconsiliation of cost and financial accounts.

Important Control Accounts

(1) Store ledge Control Account (SLC)
(2) Wages control Account
(3) WIP " "
(4) Production overhead control A/C
(5) Adminstrative overhead control A/C
(6) Selling and distribution overhead control A/C
(7) Cost of sales A/C
(8) Finished goods control account
(9) Costing P/L Account
(10) Cost ledger control Account.